



Department of
**ENVIRONMENT, PARKS AND
WATER SECURITY**

Level 1
Goyder Centre
25 Chung Wah Terrace
Palmerston NT 0830

PO Box 496
Palmerston NT 0831

E DevelopmentAssessment.DEWPS@nt.gov.au

T 08 8999 4446

Our ref: DEPWS2024/0015

Ms Mandy Trueman
Department of Environment, Parks and Water Security
PO Box 3675
DARWIN NT 0801

Dear Ms Trueman

Re: Invitation to comment - Winchelsea Island Manganese Mine Project draft Environmental Impact Statement

The Department of Environment, Parks and Water Security (DEPWS) has assessed the information contained in the above Environmental Impact Statement (EIS) and provides the following comments:

Flora and Fauna Division

The Flora and Fauna Division have reviewed the draft EIS and provides detailed comments in Attachment1. A summary of the key concerns that have been identified and discussed are provided below:

Threatened Species

The draft EIS has focused largely on the risks and potential impacts to the Masked Owl, Northern Quoll and several marine and migratory threatened fauna species. The Flora and Fauna Division's advice relates to the appropriateness of avoidance measures for important habitat features (denning habitat, nesting/roosting sites), as well as managing the risks from shipping in areas where there is potential to interact with marine megafauna.

Risks relating to ingestion/inhalation of manganese dust have been identified in the comments. Further information has been requested relating to the potential impact of manganese dust to fauna and/or if there is potential for bioaccumulation and subsequent impacts to the broader food web on Winchelsea Island.

Biodiversity

The Flora and Fauna Division have identified some discrepancies with the definition and location of Groundwater Dependent Ecosystems (GDEs) within the proposal footprint. Further clarification of the extent of the GDEs has been recommended, with the total area of vegetation impacted to be quantified in the Supplement.

The Flora and Fauna Division have also identified risks to vegetation outside the proposal footprint from wet season discharges, dust and the use of water for dust suppression. The main concern relates to the

quality of the water proposed to be used to suppress dust and if native vegetation will be adversely affected by potentially elevated levels of salinity. The Flora and Fauna Division have recommended that the proponent clarify the quality of water and the sensitivity of receiving environments.

Furthermore, the Flora and Fauna Division have commented on the effectiveness of the current and proposed biosecurity measures for the proposal. Additional recommendations have been provided; these recommendations are intended to improve the management of biosecurity hazards and to reduce the risk of future incursions of introduced species to both Winchelsea Island and the surrounding waters.

Coastal Process

A review of the hydrological and sediment transport modelling identified deficiencies in the modelling approach, particularly with the scale of the model and the quality of the data used. Recommendations to improve the model include the addition of severe weather events, but also incorporating run-off and erosion/sedimentation from mining activities on Winchelsea Island.

Marine Ecosystems

The survey (side scan sonar and drop cameras) used to produce the benthic habitat mapping for Bartalumba Bay did not have sufficient coverage and thus may under-represent the availability of important habitat types (seagrass, sponge gardens, etc.), particularly within operational areas. The provision of additional data is recommended to assist in better identifying important habitat types both within and surrounding operational areas.

The risk from manganese dust that will be spilled during loading activities has been identified as a concern, particularly for benthic habitats within the transshipment area. Recommendations on the calculation of the amount of dust expected to be lost and the deposition on benthic habitats have been provided.

The Flora and Fauna Division have identified risks to an area of high value habitat within the proposed transshipment area. While the proponent has identified an exclusion zone, the proximity of transshipment activities and anchoring to this high-value area still poses a risk to benthic fauna in the area. As such, the Flora and Fauna Division has recommended that the proponent revise the location of the transshipment area to avoid direct and indirect impacts to this habitat and associated fauna.

The proponent has provided limited information in relation to the risks to marine biota from noise and light pollution associated with the proposal and the associated shipping activities. The Flora and Fauna Division has recommended that this information be updated and include baseline noise data from the local area, rather than a busy port environment such as Darwin Harbour.

Inland water environmental quality

Further comments have been provided on the adequacy of baseline water quality information, the use of the 95% toxicant default guideline rather than the 99% (ANZG 2018), and the appropriateness of a single surface water monitoring site to monitor impacts from mining activities. The Flora and Fauna Division notes that the monitoring site is located outside of the proposal area in a separate catchment that is unlikely to be affected by mining activities.

Specific comments were made in relation to a lack of information about how and where transshipment vessels and other operational vessels would be refuelled, where fuel is proposed to be stored and what risks are posed from accidental hydrocarbon spills into the environment. The Flora and Fauna Division recommends that this information be provided in the Supplement, with specific measures to avoid or manage the risk from spills.

Water Resources Division

The Water Resources Division has reviewed the draft EIS and have provided advice in Attachment 2.

Rangelands Division

Weed Management Branch

The Weeds Management Branch has reviewed Appendix N, the Weed Management Plan (WMP). The WMP indicates that floral surveys revealed few weeds or exotic plants are currently present on Winchelsea Island. The plan addresses the importance of preventing new introductions to the island as the major concern from a weed management perspective.

Groote Eylandt's proximity means that there is high likelihood of equipment and personnel moving between the two islands. Under section 4.2 of the WMP, Table 4-1 Potential Weed Species, does not adequately cover the high-risk species present on Groote Eylandt.

A realistic species profile of declared weeds and non-declared invasive species present on Groote Eylandt to quarantine from Winchelsea Island is provided in Table 1 below. Priority invasive species are highlighted in **bold**. These species are known to be particularly aggressive disturbance colonisers on Groote Eylandt which is of very similar ecological habitat to Winchelsea Island. These species will readily invade stockpiles and rehabilitation areas should they get a foothold on the island. It is recommended these species be emphasised as species of concern and warrant image plates under section 4.2 of the WMP. These should be key species for equipment quarantine and post wet season weed inspections prior to seed set.

Additionally, Mossman river grass *Cenchrus echinatus* is incorrectly named in the document.

Table 1 - Declared weeds and invasive species present on Groote Eylandt

Common Name	Botanical Name	Declared
Foxtail agave	<i>Agave attenuata</i>	-
Khaki weed	<i>Alternanthera pungens</i>	Class B
Buffalo Clover	<i>Alysicarpus vaginalis</i>	-
Gamba grass	<i>Andropogon gayanus</i>	Class A
Coral vine	<i>Antigonon leptopus</i>	-
Neem	<i>Azadirachta indica</i>	Class B
Barleria - lupulina	<i>Barleria lupulina</i>	-
Calopo	<i>Calopogonium mucunoides</i>	-
Mossman river grass	<i>Cenchrus echinatus</i>	Class B
Mission grass - annual	<i>Cenchrus pedicellatus</i>	-

Common Name	Botanical Name	Declared
Mission grass - perennial	<i>Cenchrus polystachios</i>	Class B
Centro	<i>Centrosema molle</i>	-
Wynn cassia	<i>Chamaecrista rotundifolia</i>	-
Clitoria vine	<i>Clitoria ternatea</i>	-
Crotalaria - Gambia pea	<i>Crotalaria gorensis</i>	-
Rubber vine - Ornamental	<i>Cryptostegia madagascariensis</i>	Class A
Beggar weed	<i>Desmodium tortuosum</i>	-
Hyptis - Knob weed	<i>Hyptis capitata</i>	Class B
Hyptis	<i>Hyptis suaveolens (Mesosphaerum suaveolens)</i>	Class B
Bellyache bush	<i>Jatropha gossypifolia</i>	Class A
African mahogany	<i>Khaya senegalensis</i>	-
Lantana - common	<i>Lantana camara</i>	Class B
Lantana sp	<i>Lantana sp</i>	Class B
Coffee bush	<i>Leucaena leucocephala</i>	-
Lantana sp	<i>Lantana sp</i>	Class B
Spiked mallow	<i>Malvastrum americanum</i>	-
Guinea grass	<i>Megathyrsus maximus</i>	-
Merremia - hairy	<i>Merremia aegyptia</i>	-
Merrimia - dissecta	<i>Merremia dissecta</i>	-
Berrimah Weed	<i>Mitracarpus hirtus</i>	-
Stinking passionfruit vine	<i>Passiflora foetida</i>	-
Scoparia	<i>Scoparia dulcis</i>	-
Senna - Candle bush	<i>Senna alata</i>	Class B

Common Name	Botanical Name	Declared
Senna - Sicklepod	<i>Senna obtusifolia</i>	Class B
Senna - Coffee	<i>Senna occidentalis</i>	Class B
Sesame	<i>Sesamum orientale</i>	-
Sida - Spiny head	<i>Sida acuta</i>	Class B
Sida - Flannel weed	<i>Sida cordifolia</i>	Class B
Sida - Paddys lucerne	<i>Sida rhombifolia</i>	Class B
Singapore daisy	<i>Sphagneticola trilobata</i>	-
Rats tail grass sp	<i>Sporobolus sp</i>	-
Snake weed sp	<i>Stachytarpheta sp</i>	Class B
Stylo sp	<i>Stylosanthes sp</i>	-
Grader grass	<i>Themeda quadrivalvis</i>	Class B
Tridax daisy	<i>Tridax procumbens</i>	-
Urochloa - Para grass	<i>Urochloa mutica</i>	-

Environment Division

If the activity requires the discharge of waste to water or could cause water to be polluted, then a waste discharge licence under the *Water Act 1992* might be required. Please refer to the guidelines¹.

The proponent should note that all persons are required to comply with the General Environmental Duty under section 12 of the *Waste Management and Pollution Control Act 1998* (WMPC Act). To help satisfy the General Environmental Duty, the proponent is advised to take notice of the list of environmental considerations below. The proponent is responsible for ensuring their activities do not result in non-compliance with NT laws.

A non-exhaustive list of environmental issues that should be considered to meet requirements under NT law are listed below.

1. **Dust:** The proposed activities have the potential to generate dust, particularly during the dry season. The proponent must ensure that nuisance dust and/or nuisance airborne particles are not discharged or emitted beyond the boundaries of the premises.

¹ https://ntepa.nt.gov.au/_data/assets/pdf_file/0005/950603/guidelines-waste-discharge-licensing.pdf

2. **Noise:** The proponent is to ensure that the noise levels from the proposed premises comply with the latest version of the NT EPA Northern Territory Noise Management Framework Guideline available online².
3. **Erosion and Sediment Control (ESC):** The proponent must ensure that pollution and/or environment harm do not result from soil erosion.

The ESC measures should be employed prior to and throughout the construction stage of the development. Larger projects should plan, install, and maintain ESC measures in accordance with the current International Erosion and Sediment Control Association (IECA) Australia guidelines and specifications.

Where sediment basins are required by the development, the NT EPA recommends the use of at least Type B basins, unless prevented by site specific topography or other physical constraints.

Basic advice for small development projects is provided by the NT EPA document: Guidelines to Prevent Pollution from Building Sites³ and Keeping Our Stormwater Clean⁴.

4. **Storage:** If an Environment Protection Approval or Environment Protection Licence is not required, the proponent should store liquids only in secure bunded areas in accordance with VIC EPA Publication 1698: Liquid storage and handling guidelines. Where these guidelines are not relevant, the storage should be at least 110% of the total capacity of the largest vessel in the area.

Where an Environment Protection Approval or Environment Protection Licence is required, the proponent must only accept, handle or store at the premises listed waste, including asbestos, as defined by the WMPC Act, in accordance with that authorisation.

5. **Site Contamination:** If the proposal relates to a change of land use or if the site is contaminated, including as a result from historical activities such as cyclones, a contaminated land assessment may be required in accordance with the National Environment Protection (Assessment for Site Contamination) Measure (ASC NEPM). The proponent is encouraged to refer to the information provided on the NT EPA website⁵, and the NT Contaminated Land Guidelines⁶.
6. **Waste Management - Import and Export of Fill:** The proposed activities have the potential to generate fill and/or involve the importation of fill for use on-site. Untested fill material may already be present on the site. All fill imported or generated and exported as part of the activity must either be certified virgin excavated natural material (VENM) or be sampled and tested in line with the NSW EPA Guidelines⁷.

All imported fill material must be accompanied by details of its nature, origin, volume, testing and transportation details. All records must be retained and made available to authorised officers, upon request. The proponent should also consider the following NT EPA fact sheets: How to avoid the dangers of accepting illegal fill onto your land⁸, and Illegal Dumping - What You Need to Know⁹.

² https://ntepa.nt.gov.au/_data/assets/pdf_file/0004/566356/noise_management_framework_guideline.pdf

³ https://ntepa.nt.gov.au/_data/assets/pdf_file/0010/284680/guideline_prevent_pollution_building_sites.pdf

⁴ https://ntepa.nt.gov.au/_data/assets/pdf_file/0006/284676/guideline_keeping_stormwater_clean_builders_guide.pdf

⁵ <https://ntepa.nt.gov.au/your-environment/contaminated-land>

⁶ https://ntepa.nt.gov.au/_data/assets/pdf_file/0020/434540/guideline_contaminated_land.pdf

⁷ <https://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/virgin-excavated-natural-material>

⁸ https://ntepa.nt.gov.au/_data/assets/pdf_file/0005/285728/factsheet_avoid_danger_accepting_illegal_fill_to_your_land.pdf

⁹ https://ntepa.nt.gov.au/_data/assets/pdf_file/0008/285740/factsheet_illegal_dumping_what_you_need_know.pdf

7. **Odour or Smoke:** The proposed activities may have the potential to create odours and/or smoke. The proponent must ensure that nuisance odours or smoke are not emitted beyond the boundaries of the premises.¹⁰.

Should you have any further queries regarding these comments, please contact the Development Coordination Branch by email DevelopmentAssessment.DEPWS@nt.gov.au or phone (08) 8999 4446.

Yours sincerely



Maria Wauchope
Executive Director, Rangelands

11 April 2024

Attachment 1 – Flora and Fauna Division comments
Attachment 2 – Water Resources Division comments

¹⁰ https://ntepa.nt.gov.au/_data/assets/pdf_file/0005/950603/guidelines-waste-discharge-licensing.pdf

Attachment 1

Submission on the draft Environmental Impact Statement

Winchelsea Mining Pty Ltd – Winchelsea Island Manganese Mine Project

This submission is made under regulation 134 of the Environment Protection Regulations 2020

NT EPA reference number: EP2021/004

Government authority: Department of Environment, Parks and Water Security – Flora and Fauna Division

Section of Referral/ToR	Theme or issue	Comment
Land – Terrestrial Ecosystems		
Draft EIS Chapter 9.19.3 Land Theme Key Environmental Factor and Appendix F – Terrestrial Ecological Assessment	Threatened Species	<p>In relation to the Northern Masked Owl, Appendix F identifies that “Confirmed Masked Owl nest trees have not been located, and the southern potential roost area within the project footprint has not been confirmed as a nesting area, indicating that further research is required to identify and assess these locations (further assessment and research to identify key locations, potential nest sites).” However, acoustic records and activity suggest that roost trees or a roosting area is present. “The majority of these highly suitable nest trees were detected in an area of tall <i>Eucalyptus tetradonta/Corymbia kombolgiensis</i> habitat (VMU 30) in the southern project area, including an area where sightings and acoustic recordings indicate that masked owls <u>have a roost or nest site</u>” (Appendix F, p.63). Based on information provided in the report, 42.73% of all VMU 30 habitat on Winchelsea Island is within the ‘terrestrial disturbance envelope’.</p> <p>As identified by the consultant in Appendix F, further investigation is necessary to identify the precise location(s) of the tree(s) or roost area. Furthermore, Appendix F indicates that “the design of the proposed mine and facilities may require modification to avoid impacting Northern Masked Owl nest roost sites; however, further research is required to define and manage these important sites within the project footprint.”</p>

		<p>However, in the draft EIS, the proponent indicates only that “Project impacts will be reduced by the identification and management of roost/nest sites in association with other management measures included in Section 9.3.2-Potential Significant Impact and Risks and management plans.” These management measures are general in nature and are not specific to the Northern Masked Owl. The only species-specific avoidance strategy identified is that of a “Masked Owl tree check and clearance procedure immediately prior to clearing” (noting the challenges associated with this, as detailed in a separate comment). Notably, the proponent has not committed to further investigation of the potential roost areas within the project footprint as recommended in Appendix F. Also, they have not committed to changing the design of the proposed clearing, if doing so is identified through those further investigations as being necessary.</p> <p>Overall, the Flora and Fauna Division has reviewed the information provided in the draft EIS and considers that the proposal may have a residual significant impact on the Groote Eylandt sub-population of Masked Owls. This is due to the loss of areas that are likely to support roosting and/or nesting trees (resulting in a long-term decrease in the population and reducing the area of occupancy for an important population of the species). The Flora and Fauna Division recommends that the proponent commit to the recommendation in Appendix F pertaining to the Northern Masked Owl, as this would reduce the risk from the project to the species. Alternatively, if this is considered unfeasible, the proponent should explain the reasoning for not doing so.</p>
--	--	---

<p>Draft EIS Chapter 9.1- 9.3 Land Theme Key Environmental Factor Threatened Species</p>		<p>As identified by the proponent, the density and abundance of the Northern Quoll in mainland Top End locations is very low, however, the species “was found to be widespread on Winchelsea Island”, with a population of ~1100 individuals and “170 range areas” of quolls (identified in Appendix F as “home range areas approximating 170 Northern Quolls”) falling within the proposed disturbance footprint. This constitutes an approximate 10-14% decline in the Northern Quoll population on Winchelsea Island, without considering other factors such as roadkill (Appendix F). This is noteworthy in the context of the fact that the population on Groote Eylandt is already affected by anthropogenic activities and the population on the mainland is fragmented and at low abundance.</p> <p>The proponent suggests that the mitigation for any impact is that rehabilitation of the cleared area will occur. However, the proponent has also correctly identified that such a ‘rehabilitated’ area is not guaranteed to provide suitable habitat (“the rehabilitated area <u>may</u> provide suitable foraging habitat”). Nevertheless, the proponent concludes that the proposal is “not considered to result in a significant impact on the available habitat or population of any conservation significant species”.</p> <p>Suitability for use by any species, including the Northern Quoll, is predicated on vegetation - including rehabilitated vegetation – providing an appropriate suite of resources to the species. In the case of the Northern Quoll, it is unclear when the ‘rehabilitated’ vegetation would be capable of providing this to the equivalent of approximately 170 Northern Quolls. Given this, there remains potential for the project to lead to a decrease in the abundance of the Northern Quoll.</p> <p>To demonstrate that the proposal will not result in a long-term decline of an important population of a species that is a threatened species, the proponent should provide further information in the Supplement on the expected timeframes within which the ‘rehabilitated’ vegetation would be capable of providing resources to the equivalent of 170 Northern Quolls.</p>
<p>Draft EIS Chapter 9.1- 9.3 Land Theme Key Environmental Factor</p>		<p>The proponent correctly identifies that clearing for the project “may lead to a decline in available foraging areas for Ghost Bats” but then suggests that “bats are likely to disperse to nearby areas for foraging”.</p> <p>Ghost Bats are known to have individual (albeit overlapping) home ranges for foraging, with individuals regularly returning to the same areas to forage (e.g. Tidemann <i>et al.</i> 1985). As such, “nearby areas” are unlikely to constitute ‘free space’ but, rather, to already be used by other individual Ghost Bats. It is therefore not necessarily true that individuals that are displaced by clearing of native vegetation can simply</p>

	<p>“disperse to nearby areas for foraging”. Similarly, the fact that animals forage “around lights in urban areas and other infrastructure” on Groote Eylandt does not constitute a reliable mitigation strategy for Ghost Bats that have been displaced from their foraging areas by vegetation clearing on Winchelsea Island. This is because this relies on multiple factors – including the availability of appropriate prey at the right time and in the right abundance, as well as Winchelsea animals learning to adapt in this way. However, these factors are not guaranteed to occur.</p> <ul style="list-style-type: none"> • The proponent’s assertion that “vegetation clearing is unlikely to lead to a long-term decrease in the Ghost Bat population” cannot be substantiated in the way that the proponent asserts. • A re-assessment of potential impacts to the Ghost Bat should be undertaken in the context of the information provided above. <p>Tidemann, C.R., Priddel, D.M., Nelson, J.E. and Pettigrew J.D. (1985) Foraging behaviour of the Australian Ghost Bat, <i>Macroderma gigas</i> (Microchiroptera: Megadermatidae). <i>Australian Journal of Zoology</i> 33, 705-713.</p>
<p>Appendix F Terrestrial Ecology Report 8.1.1 Terrestrial Vegetation Clearing</p>	<p>As stated in the bat survey report (Appendix 4 of the Terrestrial Ecology Report), “Entanglement in barbed wire fences is known to have caused the local depletion of entire small colonies [of the Ghost Bat] in the Pilbara region (Armstrong and Anstee 2000). Such gradual losses on a local scale have the potential to cause a reduction in area of occupancy because recolonisation rates by females are likely to be low” (p.10).</p> <p>There are a number of references to the impact of barbed wire fencing on Ghost Bats throughout the Terrestrial Ecology Report (Appendix F), including: “threatening processes include mortality due to inappropriate fencing” (p. 99), and a recommendation that “A prohibition on barbed wire fencing will be implemented to minimise impacts on low-foraging ghost bats” (p. 104).</p> <p>Despite the recommendations in Appendix F, the proponent has not provided a commitment in Table 9.3-16 of the draft EIS to prohibit barbed wire fencing during construction or operation of the proposed manganese mine or its associated infrastructure. Given the risk that barbed wire poses to Ghost Bats, the Flora and Fauna Division supports the consultant’s recommendation; and recommends that the proponent commit to avoiding the use of barbed wire in civil works and the construction/operation of the proposal. The use of barbed wire on Winchelsea Island is not needed, given the remoteness of the operation and the absence of ungulates on the island.</p>

		<p>In the absence of a firm commitment from the proponent, the Flora and Fauna Division suggests the addition of a condition to any environmental approvals, prohibiting the use of barbed wire for all stages of the proposal.</p> <p>“The quarry will be constructed immediately to the north of MMZ Pit 2 with the disturbance area for both being contiguous. The total area of the quarry is 7.53ha and will extract to a depth of approximately 12 metres below ground level (mbgl)” (p.118).</p> <p>Appendix F states that, “While roosts in caves were not found during the survey, it is possible that ghost bat roosts are located on Winchelsea Island.” (p.77). It also says, “Northern quolls were also abundant in sandstone habitats” (p.76). It goes on to say that, “The presence of ghost bats and northern quolls on Winchelsea Island indicates that areas of complex sandstone are potential sensitive habitat for these two species (potential roost and den sites)” (p.99).</p> <p>The proponent should provide a discussion on whether the proposed sandstone quarry includes areas of complex sandstone that could provide suitable roost and den sites for the Ghost Bat and Northern Quoll respectively. This may require targeted surveys undertaken by a suitably qualified person.</p> <p>The risk to Mertens’ Water Monitor is considered to be low. Records of this species are largely confined to the north of Winchelsea Island in an area that will largely be unaffected by mining operations due to its distance from the proposed works.</p>
<p>‘Executive summary’ Terrestrial ecosystems factor and ‘Draft EIS Chapter 9.1-9.3 Land Theme Key</p>	<p>Fauna salvage and relocation</p>	<p>The proponent suggests that “clearing activities have potential to lead to some injury and mortality of fauna”. Proposed controls for clearing of vegetation include: “have a trained fauna spotter on site during clearing operations” and “Fauna spotter, ecologist or ranger to check and clear tree hollows and other habitat features immediately prior to clearing” and “implementation of a Masked Owl tree check and clearance procedure immediately prior to clearing any area”.</p> <p>The proponent does not provide detail on the above approaches. Parameters to consider include:</p> <ul style="list-style-type: none"> • whether all individuals of all species would be targeted for ‘relocation’, or just particular species, particular taxonomic group(s) or threatened species;

<p>Environmental Factor'</p>		<ul style="list-style-type: none"> • where animals would be moved, and how it would be ensured that the areas into which these 'relocated' animals are placed are suitable (including not already being at carrying capacity for those particular species); • the action that would be taken for juvenile animals that are reliant on provisioning by parents; • how tree hollows could be adequately checked "immediately prior to clearing", given the complexity of, and often, height at which such hollows occur, and the challenge of definitively determining use of such tree hollows (as supported by an inability to identify the exact location of the Northern Masked Owl roost or nest tree in the southern portion of the project area, despite extensive searching; see Section 4.6 on p.63 of Appendix F; and • what action would be taken if animals are indeed found in tree hollows. <p>In a broader sense, the proponent has intimated that use of fauna spotter-catchers is an effective control for vegetation clearing. However, during presentations to the Department, the proponent indicated their interest in obtaining advice in relation to 'sensitive' approaches for clearing native vegetation. The following advice is provided in that context.</p> <p><i>Ad-hoc</i>, poorly defined relocation programs are unlikely to provide significant reduction of mortality of fauna that is caused by clearing of native vegetation. Simply "relocating" animals to an unspecified destination does not prevent them from dying as a result of a range of causes, including injury, starvation, competition with other fauna present at the destination, habitat fragmentation, insufficient access to required habitat, and/or introduced predators. As such, the Flora and Fauna Division does not accept this as a meaningful mitigation measure, and in general does not support the use of fauna spotter-catchers, nor pre-clearing relocation of fauna.</p> <p>If pre-clearing relocation is to occur, it should have a realistic objective and target pre-determined taxonomic groups/species. It should also detail to where fauna would be relocated, how those locations are selected, what their existing faunal densities are, how relocated individuals will be monitored, and what thresholds are in place to intervene if animals are failing to survive post-relocation.</p>
------------------------------	--	--

	<p>The proponent should either detail the objectives, methods and monitoring expected of their “check and clearance procedure” or should institute sensitive clearing protocols (see Thompson and Thompson 2015). These would include (but are not limited to):</p> <ul style="list-style-type: none"> • initial use of a ‘raised blade’ on a bucket or machine so that some fauna have the opportunity to escape from the area being cleared; • hand-searching the remaining clumps of vegetation for fauna and the hand-capture of those individuals; • hand-based deconstruction of termitaria instead of demolition using heavy machinery; • having a short period of time (~5 min) between the removal of the vegetation using the ‘raised blade’ and the removal of the topsoil (Thompson and Thompson (2015)); • as identified in Appendix F, wherever possible, avoid removal or disturbance of hollow logs, standing dead trees and large old-growth trees and, for Northern Quolls, retain hollow logs and woody debris piles on the margins of the site or in rehabilitation areas; and • as identified in Appendix F, retain wildlife corridors to allow wildlife to move between mining and cleared areas. <p>A protocol that details ‘sensitive’ vegetation clearing methods is available from the authors of Thompson and Thompson (2015) and the Flora and Fauna Division recommends that the proponent follow the recommendations therein, as well as those detailed in Appendix F. At a minimum, the proponent should be searching for hollows well before clearing, categorising those hollows based on level of use by fauna (through appropriate monitoring) and avoiding clearing of trees/hollow trees that are being used until such use has declined (e.g. juvenile birds have fledged).</p> <p>Finally, Table 9.3-16 suggests that, as a mitigation and management strategy, “if an animal becomes trapped, call Wildcare for assistance or guidance.” This is inappropriate as a mitigation or management strategy. Wildcare is an extremely small, volunteer organisation that is already overstretched in terms of people and resources. Volunteers focus on hand-rearing fauna mostly in the Darwin region, and the phone number provided is the generic one, which routes to whoever the current ‘on call’ volunteer is. Winchelsea Mining cannot rely on the volunteers in Wildcare for “guidance”, especially given that such volunteers are unlikely to be experienced with the species that are likely to be injured, displaced or killed by Winchelsea Mining’s vegetation clearing and mining activities. Furthermore, Wildcare volunteers would be unable to provide</p>
--	--

		<p>“assistance”, given that the clearing and mining would be occurring on a remote island, that the abundance of animals involved in the clearing phase would be high, and that individual volunteers would not know the details of the Winchelsea project. If the proponent is to clear the vegetation as proposed, appropriate and effective mitigation and management processes that do not rely on individual volunteers who are based in Darwin should be implemented.</p> <p>Thompson, S.A. and Thompson, G.G. (2015) Fauna-rescue programs can successfully relocate vertebrate fauna prior to and during vegetation-clearing programs. <i>Pacific Conservation Biology</i> 21(3): 220-225.</p>
<p>Draft EIS Chapter 9.1-9.3 Land Theme Key Environmental Factor and Appendix H – Mine Rehabilitation and Closure Plan</p>	<p>Rehabilitation and Post Mine Use</p>	<p>The proposed rehabilitation of vegetation is almost wholly reliant on the stripping, storage and re-spreading of topsoil (to a depth of 0.3m), with the assumption that this will provide a seedbank that is both speciose and abundant enough to revegetate the areas. The draft EIS section also contains the phrase: “If required, local provenance seeding material and/or tube stock will be used to assist with establishing native vegetation during rehabilitation.” However, it is unclear from both the draft EIS and Appendix H how and when such a requirement would be determined or triggered.</p> <p>The Flora and Fauna Division notes that “establishing the appropriate capping material, including topsoil containing the original seed bank” is by itself unlikely to be sufficient for rehabilitation.</p> <p>As such, the proponent should use local provenance seeding material and/or tube stock as a standard, and not only “if required”. This is particularly the case given that Appendix H – Mine Rehabilitation and Closure Plan identifies that a current knowledge gap is that of “the viability of the topsoil as a growth media on site for rehabilitation activities”.</p>
<p>Appendix H – Mine Rehabilitation and Closure Plan</p>		<p>The proponent identifies that the objective of rehabilitation will be “to restore the landscape as closely as reasonably practicable to the pre-disturbance environment.” In order to achieve this in terms of biodiversity, both the species richness and abundance of the flora and fauna that occurred prior to clearance would need to be re-instated (to the greatest degree possible). However, the Mine Rehabilitation and Closure Plan – Section 10.1 Landscape/Vegetation Monitoring only briefly touches on biodiversity parameters (flora and fauna) that would be monitored post-rehabilitation. In particular, the monitoring parameter of “fauna activity” is unclear. “Fauna activity” – however defined – is not an appropriate singular measure for rehabilitated areas.</p>

		<ul style="list-style-type: none"> The proponent should provide monitoring indices – including thresholds for management intervention – that account for both species richness and species abundance (i.e. species diversity) of flora and fauna, as compared to a baseline established pre-clearing.
<p>Appendix F Terrestrial Ecology Report 4.11 Exotic Fauna Species</p>	Biosecurity	<p>Section 4.11 of the draft EIS states: “one domestic dog was detected on camera traps and is a known resident of the mining camp” (p. 70). Appendix F further notes that a domestic dog was detected on Winchelsea Island during surveys and was allowed to roam. It was subsequently detected on three camera traps on two separate days in two different habitats. The introduction of the dog to the island and its lack of containment suggests that biosecurity measures proposed for exploration activities may not have been implemented effectively by the proponent. In particular, Table 9.3-16 states: “No unauthorised animal, plant or vegetative material to be brought to site” (see Land Theme Chapters, p. 401).</p> <p>The Flora and Fauna Division has reviewed the Biosecurity Management Plan (BMP) at Appendix M and notes that the plan does not identify specific procedures or criteria for authorising an animal or plant/vegetative material or under what scenarios they would be allowed onto the site.</p> <p>Given the recent introduction of a domestic dog to the island with no consideration of the quarantine risk, it is recommended that the proponent provide further detail of how the incursion happened and update the BMP to clearly outline the procedures/criteria for authorising <u>any</u> non-endemic animal/plant vegetative material to Winchelsea Island. Furthermore, any authorisation must include the conditions for managing non-endemic animals while they are on the island (i.e. be contained, restrained or under effective control at all times). This should be clearly described for all stages of the proposal (including civil works, mine construction, operation and decommissioning).</p>
<p>Appendix M Biosecurity Management Plan</p>		<p>The draft EIS noted the presence of “<i>Passiflora foetida</i> – identified at the beach used as a staging point by work groups and others coming to and from the island by boat” (Appendix M, Biosecurity Management Plan, p.18). The Terrestrial Ecology Report (Appendix F) identifies that the “potential for future weed introductions from Groote Eylandt is considered high. All industrial areas on Groote Eylandt have dense weedy perimeters which include species at high risk of transfer” (p. 38) and the Risk Assessment Register (Appendix B) rates “Activities resulting in introduction of new weeds or pests, and spread of existing weeds into new areas” as an “extreme” risk for the Terrestrial Ecosystems and Land Form themes.”</p>

		<p>While the definitive source of the incursion of <i>Passiflora foetida</i> is unknown, the species' only recorded location being near a previous exploration camp is concerning. The introduction of invasive flora from Groote Eylandt is of considerable concern for biodiversity. This is due to invasive flora (depending on the species) potentially altering fire regimes, smothering native vegetation and reducing the diversity/availability of habitats on Winchelsea Island.</p> <p>The draft EIS (Appendix F) further noted that "<i>Hemidactylus frenatus</i> (Asian House Gecko) was recorded in monsoon forest in the south of the island during surveys in 2022". This species requires human help to spread to Winchelsea Island and, given its previous absence from the island (see page 19 of Appendix 4), may be a recent arrival associated with exploration activities.</p> <p>As noted in a previous comment, the Flora and Fauna Division has concerns about the recent incursions and the effectiveness of biosecurity measures on Winchelsea Island. It is recommended that the BMP (Appendix M) be updated to reflect the extreme risk associated with non-endemic species to the island's biodiversity. The Flora and Fauna Division has reviewed the BMP, and notes that it appears to borrow from a variety of existing plans, with little detail about its implementation. Recent detections of invasive flora and animals to Winchelsea Island suggest that it may not be fit for purpose. It is recommended that the proponent prepare a BMP that is specific to Winchelsea Island and this project. This should clearly outline how the approaches therein will be implemented. It should be consistent with best-practice measures for the detection of non-endemic species and weed hygiene/management and eradication measures for any invasive flora species.</p>
<p>Draft EIS Chapter 9.1- 9.3 Land Theme Key Environmental Factor</p>	<p>Vegetation</p>	<p>Some of the Vegetation Mapping Units (e.g., VMU 2, 17, 18, 19, 43, 74) have flora that indicate that they are drainage areas / wetlands / groundwater-dependent ecosystems (e.g. <i>Melaleuca</i> species, <i>Pandanus spiralis</i>) and several are identified as having a medium-high potential of being groundwater-dependent ecosystems (see Table 3.3 on p.48 of Appendix F). Furthermore, as identified in Appendix F, several of these vegetation communities (e.g., sandstone shrubland, <i>Melaleuca</i> swamp forests, mangroves, saline wetlands and closed monsoon forest) are of ecological or cultural significance. Appendix F also recommends that "minor areas of riparian and <i>Melaleuca</i> swamp forest vegetation (VMU 19=1ha, VMU43=2ha) and deciduous monsoon forest (VMU=0.2ha) should be avoided with minor modifications of the project footprint."</p> <p>However, the proposed clearing and/or disturbance footprint include some of these vegetation mapping</p>

		<p>units and the proponent does not explain why such areas cannot be excluded from proposed clearing/disturbance.</p> <p>To the maximum extent possible, wetlands, drainage areas and groundwater-dependent ecosystems should not be cleared. The provisions in the NT Planning Scheme Land Clearing Guidelines that pertain to buffers around such areas should also be applied, noting that larger buffer distances are preferable to protect sensitive habitats. If there remains uncertainty about whether a particular vegetation mapping unit is a groundwater-dependent ecosystem, then the precautionary principle should be used (e.g., excluding vegetation mapping units with a medium-high likelihood of being groundwater-dependent ecosystems, as identified in Table 3.3 on p.48 of Appendix F)</p> <p>The proponent should provide additional details about how sensitive/significant vegetation will be avoided, or provide additional justification where this does not occur. For example, as identified in Appendix F, changes to the design of facilities and access at the landing area would minimise or avoid clearing or disturbing mangrove closed forest (VMU1); and clearing and disturbance of GDEs in the south-eastern part of the project area (VMU19, VMU2) should be minimised.</p>
<p>Draft EIS Chapter 9.1- 9.3 Land Theme Key Environmental Factor</p>		<p>The proponent states that the clearing of 530ha of native vegetation is “a very conservative assumption” because it is only “potential fauna habitat”, that it “assumes disturbing the entire terrestrial development envelope” and that it “also assumes that all areas are vegetated”. It is clear from the draft EIS that all areas of Winchelsea Island have intact vegetation and that, apart from disturbance caused by mineral exploration, Winchelsea Island is functioning as an intact ecosystem. As such, the area proposed to be cleared is not “potential fauna habitat” but, rather, actual habitat for fauna from a range of taxonomic groups (as well as habitat for flora species).</p> <p>The proponent also suggests that “habitat fragmentation is not expected due to [there being] widespread representative vegetation within the region and is likely to only impact those species with short dispersal capabilities”. This represents a misunderstanding of the process of habitat fragmentation. Firstly, habitat fragmentation should be assessed at the level of the island and not regionally, as islands already fragment habitat and potentially non-mobile species; secondly, clearing of native vegetation on Winchelsea Island will indisputably lead to habitat fragmentation, as the current intact vegetation will be fragmented into patches and the ecosystem services and functions that are provided by this current intact vegetation will be eroded. Specifically, the clearing of 530ha will equate to clearing 11% of Winchelsea Island, while the 739ha</p>

		<p>'disturbance envelope' (which will lead to fragmentation of vegetation and ecosystem processes) constitutes 15% of Winchelsea Island.</p> <p>The proponent should revise the discussion of the risk of habitat fragmentation and provide an informed assessment of this threat on the biodiversity values of Winchelsea Island.</p>
<p>Draft EIS Chapter 9.3</p>		<p>It is unclear why areas of coastal monsoon vine forest could not be excluded from the proposed clearing footprint. Avoidance of this vegetation type together with that of mangroves would minimise impacts on rainforest vegetation, plus have the benefit of minimising potential impacts on the Arafura Fantail (for which a 'hotspot' of detections occurs in the south-western portion of the proposed disturbance boundary) (see Appendix EE Figure 6).</p> <p>Table 9.3-14 provides the total area of vegetation communities that will be cleared as a percentage of the 530ha 'terrestrial disturbance envelope'. Whilst this shows the percentage of those units that occur within the disturbance area, it does not show the percentage of the total amount of that vegetation type on the island to be cleared. For example, Vegetation Mapping Unit (VMU) 47 (<i>Eucalyptus tetrodonta</i>, <i>Corymbia polycarpa</i> low open woodland with <i>Asteromyrtus symphyocarpa</i> shrubland) covers 1.97% of the disturbance envelope. However, from an island wide perspective, the proposed clearing of 10.43ha of VMU 47 equates to 90.3% of the total area of VMU 47 found on the island (11.55ha).</p> <p>The proponent should provide details, in the form of tables and associated maps, of the amount of individual VMUs to be cleared as it relates to the overall occurrence of those individual VMUs island wide. This should be accompanied by a detailed discussion and assessment of the significance of the proposed clearing of each VMU.</p>
<p>Draft EIS Chapter 9.1- 9.3 Land Theme Key Environmental Factor, 9.3.2.5 Change to fire regime</p>	<p>Fire Regimes and Biodiversity</p>	<p>The information currently provided on the fire regime on Winchelsea Island is incomplete as, the proponent indicates only that "Winchelsea Island has historically experienced fire outbreaks for 2 to 3 years within a 20-year period."</p> <p>The proponent should provide information on fire extent in each of the main vegetation types, fire frequency, fire intensity and timing of fires. Such parameters should then be used to establish a baseline fire regime for Winchelsea Island.</p>

		<p>The baseline fire regime should be used to determine the 'limits of acceptable change', such that mining on the island does not shift the fire regime from this baseline. It should be noted that maintenance of this baseline fire regime (including potentially through prescribed burning), rather than fire suppression necessarily (as identified in the draft EIS), should be the objective for biodiversity conservation (as identified in Appendix F).</p>
<p>Draft EIS Chapter 9.1-9.3 Land Theme Key Environmental Factor</p>	<p>Conservation Significant Flora</p>	<p>The proponent suggests that <i>Sida</i> sp. Groote Eylandt, which is listed as Not Evaluated under the TPWC Act, is "relatively common across Winchelsea Island" and that although it is known to occur on Groote Eylandt, the extent of its occurrence there is unknown. Furthermore, Section 9.3.2.1 identifies that the species' occurrence within the Groote Archipelago has not been fully established. As such, the species' occurrence on Winchelsea Island may constitute a significant population, as confirmed in Appendix F ("the number of records on Winchelsea Island indicate that the island may be an important component of its distribution"). Figure 9.3-4 on p. 329 of the draft EIS appears to indicate that the majority of the known records of <i>Sida</i> sp. Groote Eylandt that occur on Winchelsea Island fall within the development footprint and thus would be cleared.</p> <p>The proponent should identify what proportion of the species' occurrence records fall within the proposed development footprint and, given the paucity of information regionally, whether such a clearing on Winchelsea Island would constitute a significant impact on this species.</p>
<p>Draft EIS Chapter 9.1-9.3 Land Theme Key Environmental Factors</p>	<p>Impacts on Biodiversity from increased Noise, Vibration and Dust</p>	<p>The proponent references two papers (Matsuki <i>et al.</i> 2016 and Creuzer <i>et al.</i> 2016) to suggest that dust deposition may not have an impact on native vegetation. It should be noted that both papers self-limit their findings to those of their own study areas; as such, their conclusions cannot be extrapolated to Winchelsea Island. For example, Matsuki <i>et al.</i> (2016) explicitly state that "<u>in these case studies from semi-arid Australia, we find no evidence to support the perception that, under the observed climatic condition and dust deposition rates of up to 20 or 77g m⁻² per month at Windarling Range and Barrow Island, respectively, dust accumulation on plants causes negative impacts.</u>"</p> <p>Similarly, in relation to noise and vibration, the proponent suggests that "many animals react to new noise initially as a potential threat but quickly 'learn' that the noise is not associated with a threat (Radle 2007)". Radle (2007) is not a peer-reviewed scientific journal article but, rather, seemingly a graduate student's literature review. Furthermore, given that it is a literature review – rather than primary data – and it does not</p>

		<p>relate to the species nor region in question, it is inappropriate to use Radle (2007) to support the proponent's conclusion.</p> <p>Furthermore, the proponent's commentary in relation to the responses of species such as the Ghost Bat, Northern Quoll and Northern Masked Owl to noise and vibration ("some animals may become accustomed to the new environmental conditions...while others may return realising the low level of threat...") is not supported by evidence and is uninformative to the assessment process.</p> <p>It is recommended that the proponent assess the risk and potential impact to flora and fauna from dust/noise/vibration using evidence-based information.</p>
<p>Draft EIS Chapter 9.1- 9.3 Land Theme Key Environmental Factors</p>		<p>Table 9.3-13 identifies an increase in dust as a 'potential source of impact to terrestrial ecosystems' across multiple 'risk numbers'. All of these relate to erosion-related dust and there is no identification of bioaccumulation of manganese dust in fauna as a risk factor in either this main report, nor in any other location.</p> <p>Manganese dust is known to be a hazard near open mine sites because fine particles (<2.5µm) can be carried large distances through the air to contaminate both human and natural ecosystems (WHO 2006). Fine manganese particles may deposit with high efficiency throughout the entire respiratory tract, plus accumulate in lung alveoli and pass into the bloodstream of vertebrates (Antonini <i>et al.</i> 2006). Manganese particles may also pass directly into the brain (Aschner 2000).</p> <p>Such contamination is well-studied in the context of humans and a recent study (Nasir <i>et al.</i> 2018) on Northern Quolls on Groote Eylandt also identified contamination in that species. Specifically, manganese loading was higher in quolls living closer to the Groote Eylandt Mining Company (GEMCO) mine and was higher in females than males. However, it was also found at levels exceeding international recommendations (for humans) even 20km from manganese extraction, processing and storage facilities on Groote Eylandt. Furthermore, manganese was found to be accumulating in Northern Quoll tissues, primarily in the brain (mainly the cerebellum and neocortex, which are responsible for sensory perception and motor function) and testes. The authors note that even subtle changes to the motor performance or behaviour of wild animals "can have serious implications for their survival, because movement underlies food acquisition, mating and predator escape." Additionally, the authors identified a potential impact on the reproductive capacity of the Northern Quoll on Groote Eylandt, with "potential negative effects on reproductive success and population viability" (Nasir <i>et al.</i> 2018).</p>

		<p>They also note that such effects should be contextualised by the fact that organisms living near manganese mines are “simultaneously exposed to an array of other toxic metals that may have deleterious effects on their own and/or in combination.” It should be noted that, although Nasir <i>et al.</i> (2018) focus on bioaccumulation of manganese in the Northern Quoll, it is foreseeable that bioaccumulation of both manganese and other toxic metals would also occur in other species of fauna. Furthermore, it is foreseeable that biomagnification of both manganese and other toxic metals could occur in the food web.</p> <p>The proponent should:</p> <ul style="list-style-type: none"> • identify and discuss the bioaccumulation of both manganese and other toxic metals on fauna (and not just Northern Quolls) and assess whether there is a risk of a significant impact on such species. • identify and discuss the biomagnification of both manganese and other toxic metals in the food chain on Winchelsea Island and assess whether they consider there may be a significant impact on those food webs and the species therein. <p>Antonini, J.M., Santaimaria, A.B., Jenkins, N.T., Albini, E., Lucchini, R., (2006). Fate of manganese associated with the inhalation of welding fumes: potential neurological effects. <i>Neurotoxicology</i> 27, 304-310.</p> <p>Aschner, M., (2000). Manganese: brain transport and emerging research needs. <i>Environmental Health Perspectives</i>. 108, 429-432.</p> <p>Nasir, A.F.A.A., Cameron, S.F., von Hippel, F.A., Postlethwait, J., Niehaus, A.C., Blomberg, S., Wilson, R.S. (2018) Manganese accumulates in the brain of northern quolls (<i>Dasyurus hallucatus</i>) living near an active mine. <i>Environmental Pollution</i> 233, 377-386.</p> <p>World Health Organization (WHO), 2006. WHO Air Quality Guidelines for Particulate Matter, Ozone, Nitrogen Dioxide and Sulphur Dioxide. WHO Press, Geneva, Switzerland.</p>
<p>Water – Hydrological Processes</p>		
<p>‘Executive summary’ and ‘Draft EIS Chapter 9.1-9.3 Land Theme Key Environmental Factor’</p>	<p>Impacts to GDEs from groundwater depletion and/or incursion of saltwater</p>	<p>Section 7.6 includes the following statement: “The desktop analysis and field surveys determined there are no riparian groundwater-dependent ecosystems (GDEs) on Winchelsea Island and therefore potential GDEs on the island are best defined as ‘terrestrial’ not ‘aquatic’. Therefore, while impacts to GDEs may occur from changes to groundwater salinity, these are not considered aquatic GDEs and therefore there are unlikely to be significant impacts to aquatic GDEs on Winchelsea Island.” Similarly, Section 9.3.2.11 suggests that coastal monsoon vine closed forest and <i>Melaleuca</i> mid open forest will be cleared but that “GDEs on Winchelsea Island are best defined as terrestrial”. There is typically no distinction between ‘terrestrial’ and ‘aquatic’ groundwater-dependent ecosystems; therefore, the differentiation and conclusion provided above is poorly explained.</p>

	<p>As a result of the above differentiation and subsequent conclusion, the Flora and Fauna Division considers that the impact of groundwater drawdown on GDEs has not been addressed in the Executive Summary, especially in the context of the information on p.84 of the Executive Summary that “up to 15.9ha of GDE vegetation may be indirectly impacted outside the disturbance envelope”. Section 9.3.2.11 suggests that the proponent will include GDEs in the project’s rehabilitation program “where adverse impacts are identified”. However, if GDEs themselves are not monitored, it is unclear how such impacts will be identified. It is also unclear how the rehabilitation program (which appears to be premised on stockpiling topsoil with a seed stock in it) would be modified to account for the specific requirements of rehabilitating GDEs, especially when the groundwater is no longer available to vegetation.</p> <p>It is recommended that the proponent:</p> <ul style="list-style-type: none"> • revise (or better justify) the categorisation of ‘terrestrial’ and ‘aquatic’ GDEs; • detail how “adverse impacts” to GDEs would be identified (in the context of the need for rehabilitation); • detail how the rehabilitation program would be modified to account for the specific requirements of GDEs; • better justify the vegetation types that would ordinarily be considered GDEs – including mangroves; • as suggested in Appendix F, develop measures to minimise impacts of dewatering and mine excavation on potential GDEs to the south-east of the project area; and • as identified in Appendix F, minimise clearing of key habitats for the Arafura fantail within the project footprint (VMU 2, VMU 19).
<p>Draft EIS Chapter 9.3.1.2 Groundwater Dependent Ecosystems</p>	<p>The extent of GDEs remains uncertain. Information provided in Figure 9.4-10 of the draft EIS suggests that the freshwater lens extends across much of disturbance footprint and is situated 7-15m below the surface. This information suggests that some of the vegetation overlying the freshwater lens may potentially be accessing the aquifer for all, or at least part of, the year. Vegetation dependent on accessing groundwater may be impacted or lost by groundwater drawdown/saltwater intrusion during mining activities. Notably, the results and model proposed in Figure 9.4-13 are potentially limited due to the relatively low number of bores/sampling sessions on the island and the relatively limited period of time that was used to ascertain the extent and structure of the freshwater lens on the island. It is recommended that the</p>

		proponent revise their definition of GDEs in the draft EIS and map vegetation communities that have floral components that are known to access groundwater for all or part of the year. If these vegetation communities have components that are a GDE, it is recommended that further information be provided to quantify the potential impact from drawdown and changes to the availability and water quality of groundwater during and post mining on Winchelsea Island.
Draft EIS Chapter 9.1- 9.3 Land Theme Key Environmental Factor		The modelling undertaken by the proponent indicates “there will be localised, short-term impacts to the quality of the groundwater with the abstraction of water for Project activities and pit dewatering”. The proponent then states that, “with the exception of the Main Mineralised Zone (MMZ), these are expected to return to pre-mining levels within a few years”. The timeframe for this is unclear – is it “within a few years” of the decommissioning of the mine (i.e, 11 years plus “a few years”) or some other timeframe? The proponent should better delineate the timeframes and expected impacts of groundwater abstraction on vegetation and GDEs.
Water – Inland water environmental quality		
‘Executive summary’ and ‘Draft EIS Chapter 9.1- 9.3 Land Theme Key Environmental Factor’ Main Report Land Theme Chapters	Release of Poor-Quality Water	<p>The proponent concedes that: “Increased salinity is considered the major potential impact to surface and groundwater quality” and, in the draft EIS (Section 9.3.2.8) indicates that “ongoing water quality monitoring will be completed”. However, the proponent does not provide any mitigation measures for, nor monitoring of, the impact of increased salinity on vegetation generally nor GDEs specifically, nor on ecosystem function of such vegetation. In the absence of such information, it is difficult to determine how the conclusion “Winchelsea Mining understands that potential impacts to inland water quality are mostly localised” has been determined. Furthermore, Table E-7-7 in the Executive Summary suggests that only groundwater monitoring will occur; there is no indication that GDEs that are likely to be affected by salinity, nor vegetation more broadly, would be monitored for such effects.</p> <p>“The 2,500mg/L Total Dissolved Solids (TDS) threshold is a risk based limit utilising expert input of salinity levels that could cause a decline in vegetation health as it is harder for trees to extract water with an increase in salinity” (p.467). It is not clear what ‘expert input of salinity’ means. The proponent should provide a discussion with references to published data/studies that shows how 2,500 mg/L TDS in groundwater is an appropriate threshold limit.</p> <p>It is recommended that the NT EPA request that the proponent provide specific details for the monitoring of vegetation in general, and GDEs specifically. The proponent should also identify where water will be</p>

<p>9.3.2.8 Release of Poor Quality Water</p>		<p>discharged, and the triggers/thresholds for intervention, should such monitoring indicate a change outside of the 'limits of acceptable change'.</p>
		<p>The draft EIS acknowledges that there will be water storage issues during the wet season and proposes discharges to bushland on occasions. In particular, the proponent suggests that: “water above 20% of the pit storage capacity will be discharged to bushland as required to prevent excessive accumulation of water during the wet season” (4.4.16 Water Use and Supply, p.148)</p> <p>and</p> <p>“Any planned or uncontrolled overflow discharges will occur to adjacent bushland on coastal low-lying lands. The discharge locations are adjacent to coastal areas and therefore elevated salinity is unlikely to adversely impact the coastal environment. Additionally, discharges will occur in the wet season only and consequently, water within the mine water management system will be diluted with freshwater inflows and further diluted by drainage runoff” (p 390).</p> <p>The Flora and Fauna Division has concerns about the risks and potential impact of discharging untreated water into native vegetation, especially given the little information about the salinity or other contaminants that may be present.</p> <p>Furthermore, no information on the vegetation that exists at the proposed discharge locations has been provided, especially the background level of salinity the vegetation is currently exposed to. Sudden changes to those background levels due to wastewater discharge may have a detrimental impact to the receiving environment.</p> <p>The Flora and Fauna Division recommends that the proponent provide further detail of the dilution rates and trigger levels proposed for wastewater discharge to native vegetation. Alternatively, the proponent may choose to alter their wastewater storage and treatment measures so that they are at a sufficient quality that native vegetation is unlikely to be impacted.</p>
		<p>“Figure 9.5-11 illustrates total salinity concentration to be discharged from the pit water based on 122 simulations of the water balance model (refer to Appendix P). The results show that pit water release salinity is predicted to be up to 250 (mg/L) during the earlier years increasing to 1,000 mg/L in the later years when the pit intercepts groundwater. A salinity of 250 mg/L is within the Australian good quality</p>

		<p>drinking water default guideline value of 600 mg/L, while 1,000 mg/L is within the recreational default guideline value (refer to Table 2.5 in Appendix Q for default guideline values)” (p.518).</p> <p>The TDS measure referred to is related to taste/palatability to humans and is not an indication of its potential effects on vegetation. Therefore, applying ADWG 2011 for ecological purposes is not appropriate for this situation. A discussion on the appropriateness and relevance of a human aesthetic drinking and recreational guideline to determine environmental impact should be provided by the proponent. This should also discuss applying ANZG 2018 and/or ANZECC & ARMCANZ 2000 as an alternative.</p>
Draft EIS Table 9.9-17	Risks to water quality from hydrocarbons	<p>The draft EIS provides little detail about how barges, supply vessels and transshipment vessels would be refuelled. Hydrocarbon spills pose a major threat to biodiversity and appropriate refuelling and spill management procedures should be in place during construction, operation and rehabilitation of the proposal. It is recommended that the proponent clearly outline where all vessels will be refuelled and how the risks from spills will be avoided/managed. Ideally, this should be in the form of an Oil Spill Contingency Plan that sets out key measures that would be implemented by the proponent.</p>
Main Report Water Theme Chapters 9.4.1.2 Surface Water	Physio-chemical Properties of Surface water	<p>The draft EIS includes baseline water quality sampling of surface water from two samples at one location (SW2). The samples were taken in February and May 2022 from a catchment outside of the proposal footprint. The Flora and Fauna Division does not consider that this is sufficient as a ‘baseline’ and, given the lack of broader sampling, it cannot be seen to be representative of Winchelsea Island as a whole.</p> <p>Furthermore, it is unclear how this data has been used (water modelling, hydrology, water balance, etc.) and/or which conclusions have relied on this limited dataset. A more comprehensive baseline assessment of the existing surface water quality is required to establish the baseline water quality on Winchelsea Island and to assess the potential impacts from the proposal to changes in the physio-chemical properties of surface water.</p> <p>The establishment of water quality triggers is important for ensuring the quality of surface water. However, such triggers are also important for ensuring native vegetation, biodiversity values and sensitive receptors are not adversely impacted by changes in the quality and composition of surface water. It is noted that the proponent has adopted the 95% toxicant default guideline (ANZG 2018), despite</p>

		Winchelsea Island being identified as 'pristine'. The latter classification would generally assign the 99% default values for high ecological value systems.
Draft EIS Chapter 4.4.16		<p>The report states that, "Water supply to the metallurgical plant will be via a constructed dam. Sedimentation dams will be placed to manage surface water run-off. Fresh groundwater will be extracted from two or three existing bores with the water utilized for potable, ablutions, and dust suppression purposes only. Processing water will utilise rainwater captured in onsite dams and return water from the Tailings Storage Facility (TSF) or seawater. A tailings dam will be constructed to accept tailings from the processing activities (refer to Section 4.4.16- Water Use and Supply for further details on water use and supply)" (p.92).</p> <p>Section 4.4.16 states that, "Water for mining and associated activities will be supplied from seawater, rainwater capture and groundwater" (p.147). Process plant water (e.g., ore washing) will be sourced from seawater and rainwater; human consumption, vehicle washdowns and dust suppression of the product loadout hopper will be sourced from groundwater.</p> <p>It should be explicit in any environmental approval that seawater, or a mixture of fresh and seawater, is not to be used for dust suppression purposes. This is required to minimise impacts from elevated saline levels on native vegetation.</p>
Draft EIS Chapter 9.4.1.3 Groundwater Flow Direction		<p>"A slight groundwater high appears to occur in the southeast corner, appearing to generate a westward flow of groundwater, counter to the surface topography and expected flow direction. This could indicate a groundwater mound in this area, but it remains unclear (TGS, 2023)" (p.435).</p> <p>This potential groundwater mound should be subject to further investigation and discussion as there could be implications for GDEs.</p>
Sea - Coastal Processes		
Draft EIS Section 9.7.2 Potential significant	Hydrological and sediment transport modelling	The modelling conducted suffers from severe data input limitations, as very little data of any kind have been collected within the proposed development area. Even without these limitations, the modelling approach employed is inadequate. The modelling conducted is not informative and limits the assessment of future sediment transport and related impacts.

<p>impacts and risks</p>		<p>The draft EIS appears to rely on very few weather and hydrological data inputs at the local scale. Sampling for currents in the project area would have also benefited from longer deployment and more strategic placement of loggers in the local and regional study area.</p> <p>Understanding the local conditions in the project area is vital for informing an assessment of the potential impact of a proposal and whether the hydrological model is accurate for informing sediment transport in the area. The model appears to be simplistic and needs to include atmospheric and wind conditions. It is also recommended that the model include seasonal water inflows and take into account extreme weather events that are likely to occur over the life of the proposal.</p>
<p>Draft EIS Section 9.7.2.1 Alteration to Coastal Processes</p>		<p>The draft EIS states that: “Potential impacts to coastal processes from introduction of invasive marine species and coastal sedimentation from land erosion are considered sufficiently insignificant that these sources of potential impact are not discussed in detail below.”</p> <p>The Flora and Fauna Division notes that these claims are unsubstantiated. The proposed clearing of vegetation and excavation of pits may result in severe erosion (in the absence of appropriate control measures) during significant rainfall. This allows potential for significant sediment inputs into the marine environment, which have not been considered in hydrodynamic modelling. Inputs from terrestrial water courses (even if seasonal) should be included in any modelling and accounted for in terms of potential impact.</p> <p>Section 9.7.2.1 of the draft EIS states that: “These estimates indicate that the facility will interrupt relatively small existing rates of bed load transport under ambient conditions (<50m³/year southward and <15m³/year northward), with higher rates of southward transport possible during a single significant tropical cyclone event (~100-500m³ depending on storm intensity, pathway and coincident tides) (SeaShore Engineering, 2023).”</p> <p>The Flora and Fauna Division recommends that the proponent explore the fate of interrupted sediment further using appropriate modelling, particularly when affected by severe weather events.</p>

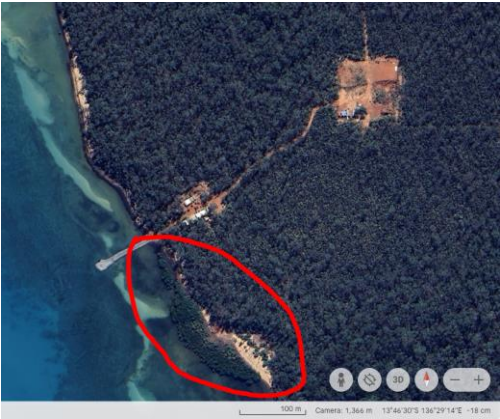
		<p>The draft EIS states that: “...of sedimentation occurring in discrete areas, it is anticipated that navigation channel management will typically involve bed levelling every 5-10 years and potentially one maintenance dredging campaign over the life of the project (SeaShore Engineering, 2023).”</p> <p>It is unclear what this estimate is based on and what the implications of recurrent dredging and ‘channel management’ would be on a range of sediment types and movement. Information on the impact of recurrent dredging and ‘channel management’ on coastal processes and marine biota should be provided in the Supplement.</p>
<p>Hydrological and Sediment Transport Modelling Appendix S</p>		<p>The draft EIS states that: “The sediment mass released to the water column during dredging and disposal is a function of the total volume (mass) of sediments dredged and disposed, as well as the dredging and disposal techniques. For the purposes of this assessment, the dredge volume of the channel leading to the wharf is conservatively assumed to be 150,000m³.”</p> <p>It is unclear how these calculations were derived. To ensure that the correct dredging volume can be assessed, it is recommended that information about how these volumes were calculated be provided in the Supplement.</p> <p>The hydrological and sediment transport model appears to be simplistic across regional and local scales. Poor ‘fitting’ is potentially the underlying cause for an “inadequate reasonable representation”, particularly concerning the boundary conditions. It is recommended that the model include atmospheric and wind conditions, as well as the influence of seasonal water inflows. The model also lacks the inclusion of extreme weather events and how these would influence the site under pre and post- development scenarios.</p> <p>The grid cell size used for the modelling appears to be too large and, due to poor representation of the conditions onsite, renders the model uninformative. The general minimum size used is 25m, rather than 50m as per the draft EIS. For the purpose of assessing impacts on benthic habitats, the Flora and Fauna Division recommends that a grid cell size of 5m or less be used. This is important, as areas of higher value can be localised and not specifically identified using a grid cell of 50m.</p>

		<p>The assessment of water level from the model (RMSE (m)) appears to exceed the recommended +/- 0.1m and vastly exceeds the +/- 15m (Appendix S Table 5-2 p.51), indicating poor model performance (see Williams 2017).</p> <p>Modelling of currents appears to have some exceedance of the recommended 50% Scatter Index (SI) (see Appendix S, Table 5-3, p.58) and appears to have some qualitative issues with the M2 phase (Appendix S, Figure 5-17 and 5-18, p.57). The fitting for currents appears to be adequate and consistent with Grote <i>et al.</i> 2016).</p> <p>Grote , M. Mazurek, N. Grabsch, C. Zelinger, J. Le Floch, S. Wharendort, D. Hofer, T. (2016) Dry bulk cargo shipping – an overlooked threat to the marine environment? <i>Marine Pollution Bulletin.</i> 110(1): 511-519.</p> <p>Williams, J. J. (2017) Guidance on setup, calibration and validation of hydrodynamic, wave, and sediment models for shelf seas and estuaries. <i>Advances in Civil Engineering</i>, 2017 (3-4): 1-25.</p>
Sea – Marine Ecosystems		
Draft EIS Section 9.9.1.5 Marine Fauna	Threatened, Migratory and Marine Species	<p>The search area undertaken for the protected matters search appears to be relatively small (Figure 9.9-12) and should have been expanded to include waters surrounding Groote Eylandt. This would better identify highly mobile species that have the potential to occur, despite there being relatively few records.</p> <p>There are several instances of classification as ‘moderate’ or ‘low’ despite the proximity of important habitat and/or known sightings of the taxa. Notably, this includes the likelihood of occurrence as ‘moderate’ for the Olive Ridley Turtle, despite major nesting habitat being only 40km north of the project area (see Appendix DD, 6.3.4 Olive Ridley Turtle, p.69). Similarly, the proponent has suggested a ‘low’ likelihood of occurrence for the Loggerhead Turtle, despite known nesting locations for this species occurring only 140km north (6.3.6 Loggerhead Turtle p.73).</p> <p>Many of the identified taxa (e.g., Whale Shark and Mobula taxa) also exhibit diel migration and are typically found at surface when transshipment and shipping operations would be occurring. This greatly increases the probability of collision with vessels. This risk has not been acknowledged or accounted for by the proponent. Interactions with marine megafauna need to be considered as operations will result in significantly greater vessel traffic in and around the proposed footprint.</p>

		Similarly, there is insufficient data on which marine species are present, and on their population abundance/density for the proponent to claim that no population-level impacts will or could occur (9.9.2.4 Marine Vessel Fauna Interactions p.243).
Draft EIS Section Table 9.8-7	Cetaceans	Table 9.8-7 identifies measures to avoid impacts to cetaceans. These measures rely on speed and approach distances being followed. While the table refers to the correct distances for an 'approach zone', as per the <i>National Guidelines for Whale/Dolphin Watching</i> , it does not include the 'no approach zone' actions, as per Table 2 of the <i>Guidelines</i> . It is recommended that the proponent update the risk mitigation measures to demonstrate that it is acting consistently with the 'no approach zone', as per Table 2 of the <i>Guidelines</i> .
Draft EIS Chapter 9.8.1.8	Benthic Habitat and Communities	<p>The draft EIS has identified a transshipment area within Bartalumba Bay, within which manganese ore will be barged and transferred to shipping vessels. The transshipment area is partially situated above a boulder field/sponge garden habitat that has the highest ecological value of all of the mapped habitat within Bartalumba Bay. Positioning of a transshipment area above a boulder field/sponge garden habitat is particularly concerning and suggestions by the proponent to avoid impact through the use of exclusion zones, appear to be insufficient. The risk to this habitat is further supported by uncertainties around the rate of manganese loss during transshipment and the presence of filter feeding organisms that are potentially sensitive to smothering and absorption of manganese ore.</p> <p>Given the rarity of this habitat within the Bartalumba Bay, and the likely ineffectiveness of the 'exclusion zone', the Flora and Fauna Division recommends that the proponent move the transshipment footprint west. This would avoid impacts from anchoring and the deposition of manganese dust on this area of rare habitat. In addition to the adjustment of the transshipment area, an exclusion zone over the boulder field/sponge garden habitat should be instated. It is recommended that the NT EPA consider including this as a condition (if approved) for the proposal. An updated hydrological and sediment model should also be provided in the Supplement to demonstrate that the transshipment area placement poses a minimal risk to this area.</p> <p>The rarity and value of the sponge garden in the transshipment area is largely due to its uniqueness in Bartalumba Bay, as well as the diversity and complexity of the community. Additional high value areas may also occur in Bartalumba Bay but due to a low level of sampling area have not been detected and documented in the draft EIS. Additional sampling within Bartalumba Bay and around Winchelsea Island would provide better contextualisation of these high value features and would demonstrate that these</p>

		<p>features are either more widespread or restricted to the transshipment area. The Flora and Fauna Division recommends that the proponent undertake these works to justify its placement of the proposed transshipment zone or that the zone should be relocated due to the risks and potential impacts on this high value habitat feature.</p>
<p>Draft EIS Figure 9.9-7</p>		<p>The proponent surveyed benthic communities and habitats within Bartalumba Bay using side scan sonar surveys presenting the data from these surveys in the draft EIS. On review of the methods, the side scan sonar survey transects throughout Bartalumba Bay appear to be spatially placed too far apart and the use of 'drop cameras' is also spatially sparse, with minimal overlap in the area proposed for dredge disposal. As such, there is limited information about the habitat types in Bartalumba Bay. In particular, the Flora and Fauna Division further notes that there has been little survey effort within the dredge disposal footprint. The proponent should provide more information on the process used to describe communities using this methodology within the relevant benthic community sections of the main text.</p> <p>It is recommended that further information be provided on the results of the survey, in order to identify the link between scan readings and the actual seabed condition. Additional survey effort and drop camera deployment would also be required to identify habitat type both within and surrounding the proposal footprint for benthic infauna, communities and habitats.</p>
<p>Draft EIS Chapter 9.9.1 (p. 158)</p>		<p>The draft EIS describes the nature of the surveyed coral reef habitats that occur within the wharf development footprint: "Analysis found that coral consisted of small colonies intermittently distributed along transects and [these] were not considered to be complex reef systems."</p> <p>It is unclear why the proponent does not consider this to be consistent with a "complex reef system", given the presence of 'high cover coral reef'. According to proponent's consultant's report a 'high cover coral reef' is one in which the percentage of cover is extremely high; this is defined as ranging between 40-80% (Appendix W - p.29). The Flora and Fauna Division agree with the assessment in Appendix W, that the coral community is consistent with a 'complex reef system' that is a "structurally complex, moderate relief" benthic community. It is recommended that the proponent clarify their conflicting assertion of the designated 'high cover coral reef' habitat in the development footprint as not being structurally complex.</p>

Appendix M		<p>The transshipment site supports an area of high biodiversity value (a boulder field and sponge garden). The proponent needs to provide further information in the Supplement to outline what measures will be in place to avoid the introduction of exotic biota to Bartalumba Bay and vessel refuelling sites. This information should include how ballast water would be cycled, as well as a baseline assessment and measures for detecting, reporting and eradicating any incursions of exotic biota to the site.</p>
Draft EIS Section 9.9.2.7 (p. 244)		<p>The draft EIS (Section 4.4.10.2 Transshipment Barging and Loading) states that the proponent will anchor within the transshipment area:</p> <p>“OGVs [Ocean Going Vessels] will utilise the vessel’s own anchor to position in the transshipment area (refer to Figure 4.4-16). Due to the low shipping volumes for the Project (15 – 26 per year) and the short loading period (maximum of 4 days), there is unlikely to be two OGVs awaiting loading at any one time. However, if the situation was to occur the waiting ship will anchor in a nearby suitable offshore location outside the identified shipping channels.”</p> <p>The transshipment site supports an area of high biodiversity value (a boulder field and sponge garden). Although an exclusion zone has been proposed around this habitat within the transshipment site, the potential for accidental deployment of anchors above the rare and highly valuable boulder field/sponge garden habitat has not been considered. Anchoring by vessels does not allow for vessel drift or else risks impacts from dragging anchors or chains. The potential direct and cumulative impacts of vessel operation, irrespective of the type of anchoring, have not been considered (i.e, disturbance from vessel wash, suspension of benthic sediments from anchor retrieval, impact of noise on mobile biota using the sponge garden habitat).</p> <p>The Flora and Fauna Division recommends that further information be provided in the Supplement to clearly identify appropriate avoidance measures that ensure that the exclusion zone will not be impacted by the anchoring of transshipment vessels.</p>
Draft EIS Figure 9.9-7		<p>The draft EIS states: “Though the seagrass and coral communities may be important for some conservation significant species, such as the Dugong and Green Turtle, the disturbance or loss of these habitats required for Project development is unlikely to cause significant impacts to these species. No conservation significant marine fauna populations or habitats are restricted to the Project development area. The</p>

		<p>habitats surrounding the Project area are widespread and well represented throughout the region (O2M, 2023a).”</p> <p>The draft EIS largely dismisses the importance of the seagrass/macroalgae in Bartalumba Bay, without providing an assessment of its use by marine megafauna or quantifying the availability of seagrass across the region. Isolated patches of seagrass/macroalgae can be important in sparse areas for dispersing marine megafauna. As such, isolated patches should not be dismissed as having little to no value without further evidence. It is recommended that the NT EPA request that the proponent provide a quantitative assessment of the availability of seagrass at the local (Bartalumba Bay) and regional scales, in order to demonstrate the full impact (direct and indirect) of the proposal on this seagrass/macroalgae.</p>
<p>Draft EIS Figure 9.7-15 (p. 62)</p>	<p>Sea Theme Chapters 9.7 Environmental Values</p>	<p>There appears to be a section of mangroves within the development zone that has not been considered or mapped in the draft EIS. It is unclear when the satellite imagery used for Figure 9.7-15 was taken, but Google Earth appears more recent as it shows development of the wharf. See also (Plate 9.9-1). The Flora and Fauna Division notes this vegetation would likely be removed under the current development scenario. It is recommended that impacts to this vegetation are considered in the assessment of the impacts of the proposal.</p> 
<p>Sea – Marine Environmental Quality</p>		

<p>Draft EIS Chapter 9.8.1.11 Marine Noise</p>	<p>Marine noise</p>	<p>There has been no baseline established for marine noise pollution that currently occurs within the footprint of the proposed development. Reports for, and the study from the East Arm development in Darwin Harbour which are referenced in the draft EIS, are irrelevant to the proposal area around Groote Eyland. Specifically the locations, the development type and scope differ.</p> <p>The proponent needs to numerically <u>model</u> changes in noise pollution that are expected during the dredging and general operation that will be associated with the proposal. Such modelling should use levels from <u>relevant equipment</u> and consider impact on marine fauna.</p>
<p>Draft EIS Chapter 9.9.2.5 Light Emissions</p>	<p>Light Pollution</p>	<p>The proponent has not provided any assessment of the light pollution that would be associated with the project, despite there being major turtle nesting aggregations on Winchelsea Island, as well as in the surrounding region. It is recommended that the NT EPA require the proponent to prepare an assessment of the light spill from the proposed operations, with a focus on the potential impacts from lighting on nesting habitat for marine turtles on Winchelsea Island. The assessment should also include offshore operations and identify appropriate mitigation/management measures that are consistent with the Australian Government's - National Light Pollution Guidelines for Wildlife.</p>
<p>Appendix S – Sediment Transport Modelling Report</p>	<p>Contamination by manganese ore</p>	<p>The proponent has decided to supply an alternative value to the 0.05% ore loss value referenced by Grote <i>et al.</i> (2016), implicating ore loss is only likely to occur due to vessel washing. As a result, the proponent has arrived at a loss value proportion that is less than that in Grote <i>et al.</i> (2016) (0.0075% for the proposed development cf. 0.05% in Grote <i>et al.</i> 2016). The justification for this reduction has not been provided by the proponent and appears to be arbitrary. A rough estimate of proportion lost for dry bulk cargoes as 0.05% – which follows the actual value given in Grote <i>et al.</i> 2016 (i.e. using the least convoluted method) – would put total ore loss at 4659.60 wmt:</p> <ul style="list-style-type: none"> • Estimated total material to be shipped = 9,319,191 wmt • Estimated total ore loss (Grote <i>et al.</i> 2016) = 0.05% • $9,319,191 * (0.05/100) = 4659.60$ ($423.6 \times \text{yr}^{-1}$; estimated 11 years of operation) <p>This represents 48.2% more than the total that is reported by proponents (2,247 wmt total; 11 yrs of operation <i>Appendix S 6.2.2 Sediment Transport Setup p. 74</i>). This value also significantly alters the reported sediment transport results in terms of volume of material. This value is only a rough estimate of loss and is not specific to manganese ore nor to the operation that is proposed by the proponent. It is recommended</p>

	<p>that justification be provided in the Supplement to explain how the proponent’s estimate was calculated. Furthermore, using the values provided by Grote <i>et al.</i> (2016), manganese ore is typically composed of between 35-54% of the heavy metal manganese. Although this is a simplistic calculation, this would result in a loss of between ~1,630 – 2,516 wmt of manganese. An assessment of the risk to sensitive receptors that rely on the quality and productivity of water should be provided.</p> <p>Grote , M. Mazurek, N. Grabsch, C. Zelinger, J. Le Floch, S. Wharendort, D. Hofer, T. (2016) Dry bulk cargo shipping – an overlooked threat to the marine environment? <i>Marine Pollution Bulletin</i> 110(1): 511-519.</p>
<p>Draft EIS Chapter 9.7.2.1 Alteration to Coastal Processes)</p>	<p>The draft EIS states: “Assuming the maximum volume of manganese ore described above (490m³) settles evenly within the dredge footprint, this equates to an approximately 0.01m (1cm) thick layer across the dredged footprint across the 11 year lifespan of the Project (~0.09cm/year). Therefore, the analysis shows that ore spillage at the two locations would not be significant enough to alter coastal processes.”</p> <p>The Flora and Fauna Division notes that the draft EIS appears to focus on the risk to coastal processes from the deposition of manganese ore but misses the impact of manganese ore as a heavy metal. Manganese ore is proven to be toxic and poses a risk to benthic marine biota (e.g., Summer et al., 2019). This risk could include killing individual organisms but also potentially preventing the future recolonisation of smothered areas by other benthic marine biota.</p> <p>The Flora and Fauna Division also notes that the rate that was calculated by the proponent may be an underestimate of the actual volume of manganese ore that is lost and deposited from operations. This is due to a change in the calculation (comments above) used to estimate the ‘loss of manganese’ from transshipment operations. As the loss of manganese ore poses a risk to benthic habitats and marine biota, the Flora and Fauna Division recommends that the NT EPA seek clarification in the Supplement about the calculation of ore loss and whether the predicted deposition accurately reflects what will occur during operations.</p> <p>Summer, K., Reichelt-Brushett, A., Howe, P., 2019. Toxicity of manganese to various life stages of selected marine cnidarian species. <i>Ecotoxicology and Environmental Safety</i> 167, 83–94. https://doi.org/10.1016/j.ecoenv.2018.09.116</p>
<p>Draft EIS Chapter 9.8.1.12</p>	<p>The proponent has referred to a 2013 study conducted by the Australian Institute of Marine Science (AIMS) at Groote Eylandt as evidence that exposure to manganese ore fines is unlikely to result in heightened levels of manganese in benthic communities and associated organismal assemblages. However,</p>

<p>Biological Characteristics</p>	<p>the study by AIMS appears to have been focused on oysters, fish, seagrass, crabs and other biota in Milner Bay, with the aim of quantifying bioaccumulation rates and determining if this poses a risk to human health. The AIMS report focuses on organisms meant for human consumption and their edibility under potential increased exposure to manganese as a result of manganese ore. Although the potential impacts to human health and the fisheries operating in the region are real and significant, human health impacts are incidental to any impacts to marine biota. The AIMS (2013) report is not suitable evidence towards negating any consideration of impacts on marine biota.</p> <p>The draft EIS appears to dismiss concerns around the potential deleterious effects of manganese ore due to smothering or other negative impacts (toxicity), despite providing no evidence that such impacts would not occur. The potential for exposure to the marine environment from ore loss during transfer at the barge loading facility and transshipment area, as well potentially from run-off, has not been considered. Furthermore, the potential miniscule particle size of manganese ore has not been acknowledged.</p> <p>Furthermore, the draft EIS mentions the following from the AIMS (2013) report: “In seawaters of the port area, manganese in both filtered and unfiltered samples was up to three times the background concentrations at control sites (Trott 2012 [AIMS 2013]). However, variability in levels within sites meant that the enrichment was not statistically significant (Trott 2012).” This indicates that manganese ore was three times higher compared to background levels; however, due to high variability in samples, the test lacked the statistical power to detect this difference. This may be methodological/study design issue/limitation and does not provide sufficient evidence that samples did not have heightened levels of manganese or that there were no impacts to the marine environment.</p> <p>As further evidence of impact to marine benthic organisms, the majority of which rely at least partially on extraction of plankton and small particles from the water column, the proponent discloses the following information in their reply: “The study found that manganese was ~5-fold higher (than control site levels) in tissues from oysters (<i>Saccostrea mordax</i>) in the port area (Trott 2012). Other elements were not concentrated at any location regardless of their sedimentary gradients (Trott 2012)”.</p> <p>The proponent should validate their assertion that there will be no long-term deleterious effects on benthic communities and associated habitat from increased exposure to manganese ore. Given the level of uncertainty, as well as the absence of evidence of there being no risk, the Flora and Fauna Division recommends that the NT EPA request further information on the risk from manganese fines on sensitive</p>
-----------------------------------	---

		<p>receptors. The information provided should identify information deficiencies and clarify how long-term exposure to heightened manganese concentrations is expected to impact benthic habitats and the marine ecosystem in Bartalumba Bay.</p> <p>Trott LA (2012). Milner Bay Project: Marine Environmental Survey. Report produced for GEMCO – BHP Billiton. Australian Institute of Marine Science, Townsville. 204 pp.</p>
<p>Draft EIS Chapter 9.8.4 Monitoring and Reporting</p>	<p>Proposed monitoring</p>	<p>Section 9.8.4 of the draft EIS provides a summary of the monitoring and reporting that would occur during the construction and operation of the proposal.</p> <p>The parameters proposed in Table 9.8-6 appear to be relatively non-descriptive and it is unclear who will be responsible for monitoring water quality. Furthermore, it is unclear from the table or the draft EIS what the individual trigger thresholds are (and how they relate to biotic sensitive receptors) and what measures will be implemented in the event that a water quality trigger is exceeded. It is recommended that the proponent provide additional detail in the Supplement to clearly outline how and by whom monitoring will be implemented, as well as to whom results will be reported.</p> <p>The proponent should provide in the Supplement a clear compilation of all proposed monitoring activities directly or adjacently relevant to sea themes into a single table. This table should include:</p> <ul style="list-style-type: none"> • proposed monitoring activity (including all recorded variables and relevant units); • reason for monitoring (including direct reference to defined thresholds if relevant); • the parties responsible for carrying out the proposed monitoring; • the parties that ongoing monitoring will be reported to, and at what frequency/milestones reporting to identified parties will occur; • period/s during which monitoring is proposed; • monitoring duration; • monitoring frequency: and • the thresholds considered, including justification for the prescribed thresholds. <p>This should include those outlined in Appendix T, Appendix B Marine Water Quality Monitoring Program (MWQMP), in addition to all monitoring outside of the MWQMP.</p>

<p>Appendix T - Dredge and Spoil Disposal Management Plan</p>		<p>Specific comments on details from the Dredge and Spoil Disposal Management Plan (Appendix T) are provided below and should be addressed in future revisions of the plan:</p> <ul style="list-style-type: none"> • In Section 7 of Appendix T, Table 5, Item 1.2 identifies that <i>in situ</i> monitoring of light data will be conducted; however, there is no further detail as to how light will be monitored <i>in situ</i>. • In Section 7 of Appendix T, Table 6, Item 2.3, reference is made to an “overall Environmental Management Plan”; however, no location is provided and there is no appendix or section named as this in the draft EIS. • In Section 7 of Appendix T, Table 6, Item 2.6 and Item 2.7, the proponent indicates that the position of the dredge/dredge equipment relative to the disposal zone will be assessed once weekly. However, this frequency of checking seems relatively low and evidence that the relevant equipment will remain stationary should be provided as justification for a weekly check. Similarly, the proposed contingency in the event of dredge spoil release outside of the disposal zone is that of cessation of operation and relocation of the equipment. However, in addition to this, the proponent should monitor the extent of spoil disposal outside of the zone. • In Section 7 of Appendix T, Table 6, Item 2.9, the proponent indicates that post-dredging surveys will be conducted within 6 months of the completion of dredging. However, this is unlikely to capture the impact. As such, monitoring should be started immediately after the proponent ceases operation. Indeed, this is seemingly already proposed in the MWQMP Appendix B1.2, Table 13 (daily monitoring for two weeks prior operation completion at nominated sites). The proponent should clarify whether post-dredge monitoring will begin immediately – as per the MWQMP – or will only be conducted from 6 months onwards. • In Section 7 of Appendix T, Table 8, the proponent provides an inadequate description of vessel bunkering. Additional detail is absent from the appendices, as well as from the draft EIS. The proponent should provide clear, detailed information on the approach proposed for vessel bunkering. • The contents of Table 13 ‘Threshold limits and zones of impacts for corals and seagrasses’ and Table 14 ‘Indicative water quality monitoring locations and management outcomes’ appear to be reasonable. However, the duration of monitoring that is proposed (i.e. daily for two weeks) should be increased in order to reflect the running mean periods described in Table 13. Similarly, the proponent should conduct additional benthic transect surveys at the identified sampling points (Figure 5). Such surveys should include inspection of sensitive receptors via video survey methodology (e.g. Remote Operated Vehicle (ROV)) in order to monitor cover percentage and taxonomic composition (to the lowest
---	--	---

		<p>possible level). They should also include visual condition assessments for sensitive receptors (i.e., corals, seagrasses, sponges) that are present. Condition indicators could include tissue loss (corals, sponges), bleaching (corals and heterotrophic sponges) and/or necrosis (all). The proponent should also collect samples in order to monitor dredge impact and assess against appropriate pre-determined triggers. For seagrass, this can include above and below-ground biomass and carbohydrate content.</p>
--	--	---

Attachment 2

Submission on the draft Environmental Impact Statement

Winchelsea Mining Pty Ltd – Winchelsea Island Manganese Mine Project

This submission is made under Regulation 134 of the Environment Protection Regulations 2020

NT EPA reference number: EP 2021/004

Government authority: Department of Environment, Parks and Water Security – Water Resources

Summary: Comments are specific to water extraction licence requirements for the proposal under the *Water Act 1992*. Water use is proposed for ore processing, dewatering operations, dust suppression and domestic consumption.

Section of Referral	Theme or issue	Comment
Appendix O Groundwater Investigation – Proposed Mining Activities pg. 48	Requirements under the <i>Water Act 1992</i> and Water Regulations 1992	<ul style="list-style-type: none"> • There are currently no water extraction licences on ML32704. • Appendix O estimates that the main water demands are predicted to be 152.6ML/yr (dust suppression, domestic consumption and washdown areas). • Water supply for the mine will be via one or two production bores tapping the aquifer’s freshwater lens. • Seawater will be used to process the manganese ore and decant water will be reused in the processing – 162.4ML • The project will require a water extraction licence to use groundwater taken from the borefield. • Winchelsea Mining project will require a Tier 3 licence application as an environmental impact statement is required (refer to https://nt.gov.au/environment/water/licensing/water-extraction-licence/tiers). • Water Assessments team have not yet received any application for a water extraction licence for the dewatering process or for the estimated 152.6ML/yr groundwater required.
Appendix O Groundwater Investigation –	Requirements under the <i>Water Act 1992</i> and Water	<ul style="list-style-type: none"> • The orebody intersects a saturated zone in the eastern part of the ‘Primary resource area’, and in the ‘Northeast resource area’.

<p>Proposed Mining Activities pg. 48</p> <p>Draft Environmental Impact Statement Chapters 9.4-9.6 (9.4.2.4)</p>	<p>Regulations 1992 – Dewatering</p>	<ul style="list-style-type: none"> • Dewatering will be required as part of the extraction process of the orebody. • Dewatering may require a water extraction licence. • It is expected that the daily average rate of water extraction will be approximately 420kL/day of potable water over the life of the Project. • A small portion of one of these potential GDEs intersects the proposed mining area and may be affected by groundwater drawdowns from dewatering in this area. The water licence application will require assessment from Water Assessments team when the application is received.
<p>8.1 Surface Water Impacts pg. 80</p>	<p>Impacts to surface water - Requirements under the <i>Water Act 1992</i> and <i>Water Regulations 1992</i></p>	<p>The potential surface water impacts of the project include:</p> <ul style="list-style-type: none"> • local drainage impacts due to construction of diversion bunds and banks; • changes in water availability due to changes in the catchment area of the various flow; • paths that drain the mining lease area and capture of runoff within the mine water management system; • impacts on receiving water quality due to land disturbance and potential discharge of water from the mine water management system during the operational phase of mining; • impacts on receiving water quality due to overtopping of final voids in the final landform; • the planned works likely require an interference with a waterway permit under section 41 of the <i>Water Act 1992</i>; and • further detail will be required on works likely to be interfere with waterways.