NORTHERN TERRITORY GOVERNMENT
Department of
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Our ref: DEPWS2021/0128
Your ref:

Ms Kylie Fitzpatrick
Department of Environment, Parks and Water Security
PO Box 3675
Parap NT 0801

Dear Ms Fitzpatrick

Re: Referral – Upgrade to Paru Road Upgrade, Melville Island

The Department of Environment, Parks and Water Security (DEPWS) has assessed the information contained in the above referral and provides the following comments.

Flora and Fauna Division
Terrestrial Ecosystems
Melville Island is situated within the Tiwi-Cobourg Bioregion, with a total area of approximately 1.01 million hectares (ha). Current figures for cumulative loss of native vegetation cover within the Tiwi-Cobourg Bioregion indicate that approximately 40,007ha or 3.96% of the native vegetation cover has been cleared. Virtually all of this clearing is contained within the Tiwi Subregion. Additional clearing associated with this proposal will increase this by no more than 0.01% at both Bioregional and Subregional scales.

Clearing for the project is largely focused on the most commonly occurring woodland vegetation types within the bioregion (*Eucalyptus miniata*, *Corymbia nesophila* and *E. tetrodonta* woodlands with variable perennial tussock grass ground layer), which represent over 70% of the intact savannah woodlands within the Bioregion. The Flora and Fauna Division consider that the proposed clearing associated with the project, representing less than 0.01% of the regional extent, is unlikely to contribute significantly to the loss of ecological integrity within these savannah woodland habitats of the Bioregion.

Threatened Species
Based on a search of DEPWS flora and fauna databases within 10km of the project area, expert knowledge of species' habitat requirements, and information about habitats occurring within the locality, the following threatened species may occur within or immediately adjacent to the application area.

Common Name	Scientific Name	TPWC Act	EPBC Act
Partridge Pigeon	*Geophaps smithii smithii*	Vulnerable	Vulnerable
Tiwi Islands Treesnail	*Amphidromus cognatus*	Vulnerable	
Northern Brush-tailed Phascogale	*Phascogale pirata*	Endangered	Vulnerable
Brush-tailed Rabbit-rat	*Conilurus penicillatus*	Endangered	Vulnerable
Butler's Dunnart	*Sminthopsis butleri*	Vulnerable	Vulnerable

Common Name	Scientific Name	TPWC Act	EPBC Act
Black-Footed Tree-rat	*Mesembriomys gouldii*	Vulnerable	Vulnerable
Pale Field-rat	*Rattus tunneyi*	Vulnerable	
Mertens' Water Monitor	*Varanus mertensi*	Vulnerable	
Floodplain Monitor	*Varanus panoptes*	Vulnerable	
Red Goshawk	*Erythrotriorchis radiatus*	Vulnerable	Vulnerable
Masked Owl	*Tyto novaeholladiae (melvillensisi)*	Endangered	Endangered
an orchid	*Calochilus caeruleus*	Vulnerable	
Darwin Cycad	*Cycas armstrongii*	Vulnerable	
a shrub	*Dendromyza reinwardtiana*	Vulnerable	
a tree	*Endiandra limnophila*	Vulnerable	
Climbing Pandanus	*Freycinetia excelsa*	Vulnerable	
Climbing Pandanus	*Freycinetia percostata*	Vulnerable	
an orchid	*Luisia corrugata*	Vulnerable	
a vine	*Mitrella tiwiensis*	Vulnerable	Vulnerable
a tree	*Tarennoidea wallichii*	Vulnerable	
an orchid	*Thrixspermum congestum*	Vulnerable	
Typhonium	*Typhonium jonesii*	Endangered	Endangered
Typhonium	*Typhonium mirabile*	Endangered	Endangered

TPWC Act - *Territory Parks and Wildlife Conservation Act 1976*
EPBC Act - *Environment Protection and Biodiversity Conservation Act 1999*.

Field assessment has been undertaken for species considered by the proponent to have the potential to occur within the project. The Flora and Fauna Division generally agree with the selection of species identified for targeted field survey and further assessment. Specific comment on individual species or groups of species are provided below.

Red Goshawk: One potential nest site for Red Goshawk was identified within the Gravel Pit 1 project area. This site is located approximately 80m from the current and preferred road alignment and adjacent to the proposed gravel extraction site GP1-1. An 80m buffer (Figure 13) is proposed to be implemented around this potential nest site as a control measure to mitigate potential impact on the nest site as a result of construction works.

The Flora and Fauna Division agree with the impact assessment undertaken for this species. The cumulative contribution of this project will further reduce Eucalypt woodland habitat within the breeding territory and home range of any pair of birds using the nest site by approximately 2% and 0.5% respectively. These levels of additional clearing represent a reduction of overall native vegetation cover to 94.5% and 94.7% respectively, and are not expected to result in a significant impact on individual birds or the Tiwi Island population of the Red Goshawk.

Partridge Pigeon: Seven Partridge Pigeons were sighted during field surveys within the project area. Partridge Pigeons are mobile, exploiting patches of suitable foraging resources within the savannah woodland habitat matrix. It is considered unlikely that the habitat present within the project area is critical to the survival of the species at the regional scale. Based on the proportion of the regional population potentially impacted (c. 0.5%) and the small area of habitat impacted by the proposed clearing, the Division consider it unlikely that the project would lead to a significant impact upon the Tiwi Island population of Partridge Pigeon.

Masked Owl: Field surveys confirmed the presence of Masked Owl within the project area. At least two Masked Owl territories were detected within Gravel Pit 1 and Gravel Pit 2. Historical records also indicate that a number of territories may overlap the proposal. No additional surveys were undertaken to identify potential breeding or roost sites for the species.

The survey results suggest that the woodland habitat within the footprint of the proposed development represents foraging habitat and potentially breeding habitat for Masked Owl. Removal of native vegetation within the proposed road alignment and supporting gravel extraction pits will reduce the availability of these habitat types, however the likelihood of this having a significant impact upon the species is considered low due to the small total area of disturbance (74.7ha) relative to the estimated territory size of a breeding pair (c. 1000ha). As noted in the referral, there is a large amount of relatively unfragmented habitat across Melville Island and the Division considers that the removal of the small amount of habitat for the project would not impact on the area of occupancy of the species, fragment the population, lead to a long-term decrease in the population or reduce its ability to successfully reproduce on the Tiwi Islands.

However, there is some uncertainty about whether tree hollows, for which Masked Owls have relatively specific requirements, are limited on the Tiwi Islands. This uncertainty could be reduced by further assessment on the availability of large (DBH>40cm) and very large (DBH>50cm) trees. Trees of this size have a higher likelihood of containing hollows that over time may be suitable for this species. In the event that potentially hollow bearing trees are not limited in the vicinity of known occurrences, the proposed clearing of native vegetation is unlikely to impact on habitat availability for the species. This is discussed further under 'sensitive/significant vegetation' below.

Brush-tailed Rabbit-rat: Although suitable habitat is present, no Brush-tailed Rabbit-rats were recorded during fauna surveys using methods suitable to detect this species. The only other systematic survey undertaken in this area, in 2000, also did not record Brush-tailed Rabbit-rats. The likelihood of occurrence of this species in the development area is considered by the Flora and Fauna Division to be low.

Brush-tailed Phascogale: No Brush-tailed Phascogales were detected during surveys of the proposed development site. However, this species is predominately arboreal and is extremely difficult to detect, and sample methods likely to detect the species were not used.

Records of this species from Melville Island during the past 10 years are all from a single area, approximately 15km north of the development site. Key habitat for this species is believed to be large trees (40cm–70+cm DBH), with rough bark (*Eucalyptus tetrodonta* is slightly favoured) and tree hollows for daytime shelter. Section 7.4 of the Biodiversity Survey identifies that stands of vegetation supporting high densities of large trees, potentially with tree hollows, are likely to occur within the survey area. Uncertainty about potential impacts on this species by the project could be addressed by quantifying the density of large (DBH>40cm) and very large (DBH>50cm) trees within and around the development footprint. This is discussed further under 'sensitive/significant vegetation' below.

Black-footed Tree-rat: There were 11 Black-footed Tree-rat records within or immediately adjacent to the project area during field surveys. There are a total of 171 Black-footed Tree-rat records from Melville Island within DEPWS databases. The species is known to utilise a range of habitat types for foraging purposes with the area centred on a suitable den site, typically a hollow-bearing tree of suitable size to accommodate the animal. Evidence from mainland populations suggest home ranges vary between c. 27ha and c. 67ha in size dependent upon the degree of habitat fragmentation. Occupancy of individuals is known to be unaffected by low levels of disturbance.

The Flora and Fauna Division considers the proposal is unlikely to reduce the area of occupancy of this species. Although it is likely that the proposed clearing will reduce the availability of suitable habitat for individuals whose home range overlaps the footprint of disturbance, any loss of habitat from a single home range is not likely to be a significant proportion of the total occupied home range. Similarly, the large area of contiguous suitable habitat in the area, and previous studies that suggest Black-footed Tree-rats are able to adapt to low levels of habitat disturbance, would indicate that individuals are not likely to be significantly impacted by the relatively small area of habitat loss associated with the proposed clearing.

Pale Field-rat: Field surveys identified two occurrences of Pale Field-rat within the Creek Alignment and Gravel Pit 1 sections of the preferred alignment (from a total of 6 sample sites). There are approximately 150 records in DEPWS databases of Pale Field-rat from Melville Island, but recent evidence suggests that the population is experiencing a significant decline with reductions in trapping success rates of approximately 80% over the last 15-20 years (Davies et al. 2018). Although the significant impact assessment presented in the referral suggested there was no likelihood of a significant impact from the proposal, this analysis was overly simplistic, particularly in the context of evidence of substantial declines. The current distribution and microhabitat requirements of this species on Melville Island are not sufficiently well known and it is possible that a local occurrence within the project area may be part of an important subpopulation. Extensive sampling would be required to establish the significance of the local context within a regional context. To mitigate this risk, it is recommended that sufficient additional sampling be undertaken to ensure that gravel pits (and associated habitat disturbance) are sited within the 'Gravel Pit 1' and 'Gravel Pit 2' zones in areas where Pale Field-rats are shown not to occur.

While the road alignment should also avoid areas where Pale Field-rats are known to occur to the extent that this is practical, the loss of potential habit associated with the road alignment itself is very small, and is not likely to result in a significant impact to this species.

Butler's Dunnart: Surveys detected this species at three sites (from a total of six) within the proposal footprint (Gravel Pit 1, Gravel Pit 2, and Creek Road Alignment). These records confirm that suitable habitat is present within the proposal footprint and at least some areas are occupied by the species. Although the significant impact assessment presented in the referral suggested there was no likelihood of a significant impact from the proposal, this analysis was overly simplistic, as sparse data for this species makes it difficult to contextualise the significance of these records from both a regional and population perspective.

Butler's Dunnart has been recorded across most of Melville Island except in the far east and southwest along the Paru Road alignment. Currently, the population structure is unknown and may comprise one large connected population or several disjunct populations in areas of suitable habitat. The new records from the project area are ~24km from the nearest known records and beyond the dispersal distance expected for the species (Potter 2017), and it is possible that the local occurrence within the project area may be part of an important subpopulation. Extensive sampling would be required to establish the significance of the local context within a regional context. To mitigate this risk, it is recommended that sufficient additional sampling be undertaken to ensure that gravel pits (and associated habitat disturbance) are sited within the 'Gravel Pit 1' and 'Gravel Pit 2' zones in areas where Butler's Dunnart are shown not to occur.

While the road alignment should also avoid areas where Butler's Dunnart are known to occur to the extent that this is practical, the loss of potential habit associated with the road alignment itself is very small, and is not likely to result in a significant impact to this species.

Tiwi Islands Treesnail: A single historical record of the Tiwi Islands Treesnail is known from the vicinity of the current crossing of the unnamed creek on the Paru Road. No additional records of this species were obtained during field survey conducted as part of this referral, although it is unclear if any specific methods were employed to target this species.

The species is known to occur in monsoon rainforest habitats, with only four records of the species known from Melville Island. However, there has been very limited sampling for this species on the Tiwi Islands, and it is likely to occur in comparable habitat in other locations.

The preferred alignment of the Paru Road will impact a small area of monsoon rainforest habitat suitable for the species. Based on the extent of similar rainforest habitat present on the Tiwi Islands, and the

likelihood that additional records of the species would result from targeted surveys, it is considered unlikely that the small area of disturbance associated with this proposal would result in a significant impact upon this species.

Floodplain Monitor, Mertens' Water Monitor: A single record of Mertens' Water Monitor was made during field surveys. This record was in riparian habitat within the creek road alignment section of Paru Road. The main risk to these species is from cane toads, which has resulted in significant declines in the Top End. The cane toad is not present on Melville Island and is unlikely to be introduced by the proposal. The Flora and Fauna Division considers that the risk to this species is low.

Although there are historical records of Floodplain Monitor from the Tiwi Islands, further expert scrutiny of these records and subsequent examination of available specimens suggests that they are likely Gould's Sand Monitor (*Varanus gouldii*) that have been misidentified. The Flora and Fauna Division notes that there is uncertainty about the presence of this species on the Tiwi Islands, but any risk to the taxa associated from the proposal is likely to be very low.

Darwin Cycad: This species is known to occur with the closely related *Cycas maconochiei* at high densities across the Tiwi Islands. Intergrades between the two species are also known to occur within their ranges, which can make positive field identification difficult. In a regional context, high (>400 mature stems/ha) and very-high (>700 mature stems/ha) stands of Darwin Cycad are considered likely to be important to the maintenance of genetic diversity within the population.

It is unclear from the survey results what densities of cycads were recorded from within the project area or the degree of certainty with which the plants could be confidently identified as *C. maconochiei* as opposed to *C. armstrongii*. Given the generally observed pattern of high cycad abundance in suitable habitat across the Tiwi Islands it is unlikely that the relatively small area of clearing associated with this project would result in a significant impact at the regional scale.

Monsoon and Riparian Rainforest Species: A number of species associated with monsoon or riparian rainforest occur in riverine habitats within the creek crossing alignment on the Paru Road. The Flora and Fauna Division agree with the referral that *Luisia corrugata*, *Mitrella tiwiensis* and *Tarennoidea wallichii* potentially occur in this area. However, these areas are also potential habitat for a number of other species including *Dendromyza reinwardtiana*, *Endiandra limnophila*, *Freycinetia* spp. and *Thrixspermum congestum* which are known to occur in similar habitats in the general area. The Division consider that *Garcinia warrenii* is unlikely to occur given what is known of its habitat from the single known site on Melville Island.

Incidental survey reported in the referral did not encounter any of these target species. However, it is unclear from the biodiversity survey report a) the precise method employed in these searches; b) the intensity at which they were conducted; and c) if the recorded absence was a function of a lack of suitable habitat within the project area.

The general patterns of occurrence of these species are either sparsely distributed individuals (orchids and pandans in particular) or small populations restricted to defined geographic areas with a strong bias toward immature plants (trees, vines and shrubs). Consequently, it is important to understand the confidence around any survey and the (lack of) detection as part of an impact assessment for these species. In the absence of this level of information, it is unclear if there is potential for a significant impact on an important population of any of these species. It is recommended that the proponent provide additional detail to support the absence of these species from the project area.

Typhonium jonesii, *Typhonium mirabile*: The Flora and Fauna Division consider that the surveys for these species were appropriate and provide a useful basis for the assessment of impacts on local and regional (global) populations. However, a large proportion of one proposed extraction site (GP1-2) has not been surveyed for *Typhonium* spp. It is recommended that further survey is undertaken to clarify the number of plants potentially impacted by extraction in this area. Alternatively, gravel pits could be configured to avoid the unsurveyed area.

If adopted, the preferred Paru Road alignment and associated extractive works will result in the removal of 24 *T. jonesii* and 20 *T. mirabile* plants from various locations along the alignment. Based on the current understanding of the population size and distribution of plants within suitable habitat in the area, these losses represent 3.6% and 2.9% of the currently known global populations respectively. These proportions are likely to be overestimates, as real population sizes are likely larger than available records indicate.

The proponent has assessed that the proposal is not likely to have a significant impact based on the significant impact guidelines for the EPBC Act. The Division generally agree with this interpretation.

It is noted that the Flora and Fauna Division do not agree that the proposal is unlikely to result in invasive species becoming established within suitable habitat for *Typhonium* spp. Evidence from elsewhere on the Tiwi Islands suggests that grassy weeds in particular have the ability to readily establish in areas of disturbed ground that do not have native vegetation cover re-established. Although the impacts of such establishment on regional populations of Typhonium may not to be significant, controls and management strategies should be implemented for a period of time that exceeds the life of the construction environmental management plan to ensure that declines in habitat quality do not occur as a result of the works.

Sensitive/Significant Vegetation

The proponent has developed fine scale vegetation mapping of relevant parts of the project area where vegetation clearing is proposed. The preferred alignment proposed in the application largely avoids vegetation types considered sensitive or significant under the Land clearing Guidelines and appropriate buffers of retained native vegetation have been applied.

In the two instances where the proposed alignment disturbs water courses or drainage areas (the unnamed creek and a small area of vegetation map unit 4b, *Erythrophleum chlorostachys* woodland on upland drainage, in the Gravel Pit 1 zone), appropriate steps have been taken to minimise disturbance including realignment and the implementation of specific controls relating to vegetation clearance and erosion/sediment control. These measures are likely to reduce the potential for impacts and result in it being unlikely that a significant impact upon the environment would result.

Section 7.4 of the Biodiversity Survey report identifies that stands of vegetation supporting high densities of large trees with hollows important for threatened vertebrate fauna are likely to occur within the survey area. No effort has been made to quantify or contextualise this as part of the referral. It is therefore unclear what the potential impacts of removal of such trees may have on habitat availability for some threatened fauna that rely on these trees (as discussed above).

It is recommended that the proponent assess the density of large (DBH>40cm) and very large (DBH>50cm) trees with the potential to support tree hollows within the areas proposed for clearing. Comparison with densities in surrounding areas of similar habitat adjacent to the project footprint should be made to contextualise the potential impacts of any loss of large trees on habitat availability for threatened species at the local scale. Similar approaches have been utilised to assess large-tree densities in proximity of linear infrastructure development on the Tiwi Islands including for the Tiwi Islands Energy Solutions Overhead Power Network project that was assessed by the NT EPA in 2019 (DENR2019/0167). If densities within proposed clearing areas are similar to those in surrounding habitat then it provides

additional evidence that the loss of large trees within the relatively small area proposed to be cleared will not impact significantly on resource availability for populations of threatened species including Masked Owl, Brush-tailed Phascogale and Black-footed Tree-rat. It may also be possible to avoid relatively dense patches of larger trees if these are shown to occur within the project area.

Aquatic Ecosystems
No information has been provided in the referral to outline the nature of instream aquatic habitats associated with the unnamed creek on Paru Road. No significant freshwater aquatic species have been previously recorded from within or immediately adjacent to the project area.

Further details should be provided of any aquatic habitats present within or downstream of the project area, particularly near the proposed realignment of the road at the creek crossing, that have the potential to be directly or indirectly impacted as a result of the proposed works. It is likely that best-practice construction environmental management practices and erosion and sediment controls would reduce potential risks to sensitive receiving habitats to acceptable levels, however, this cannot be fully assessed based on the information provided with the referral.

Recommendations
There are a large number of threated species that potentially occur (or are known to occur) within the project area. For many of these species, the Flora and Fauna Division is satisfied that the referral provides sufficient information to demonstrate that there is a low likelihood of significant impact from the proposal.

The Fauna and Flora Division has identified information gaps and uncertainties relating to the potential risk to some threatened species. It is recommended that the proponent provides the following additional information or undertakes the following measures to ensure risks are adequately reduced:

- Provide additional survey details to demonstrate confidence about the absence of significant monsoon and riparian rainforest species from the riverine forest associated with the creek crossing on the Paru Road, and/or demonstrate that the habitat is not suitable for the species with potential to occur in this area.
- Configure gravel pits to avoid areas in GP1-2 that have not been completely surveyed for *Typhonium* spp. If this is not possible, clarification of *Typhonium* spp. presence/absence and abundance within GP1-2 through additional survey is required to ensure there is no significant impact on these species.
- Undertake sufficient additional survey within the proposal footprint to ensure that gravel pits can be located within areas where Pale Field-rat and Butler's Dunnart are known to be absent. If this is not possible, additional regional survey would be required to clarify the significance of the local occurrence of these species.
- Undertake additional sampling to assess the density of large (DBH>40cm) and very large (DBH>50cm) trees with the potential to support tree hollows within the areas proposed for clearing, and provide a comparison with densities in surrounding areas of similar habitat to contextualise the potential impacts of loss of large trees on habitat availability for relevant threatened species (Masked Owl, Brush-tailed Phascogale and Black-footed Tree-rat). Areas with relatively high densities of large hollow-bearing trees should be avoided where possible.
- Provide further detail on the duration and content of the proposed weed management program to clearly demonstrate that the measures put in place to monitor the establishment, spread and control of weeds will minimise any risk to threatened species and their habitat.
- Clarify the presence and extent of any aquatic habitats within or adjacent to the proposed works and outline specific measures to be put in place to ensure potential impacts on sensitive receiving habitats are minimised through environmental management and erosion/sediment control systems.

Water Resources Division

Section of Referral	Theme or issue	Comment
	Water Usage	The referral does not identify the volume of water required for the project, or where the water will be sourced from. The project benefits from an exemption to the *Water Act 1992*, gazetted 28 November 2008, which specifies that the take of surface water or groundwater for road works does not require an extraction licence. The project also benefits from an exemption to the *Water Act 1992*, gazetted 30 June 1992, which exempts the requirement to obtain a permit to interfere with a waterway for road drainage works.
	Water Source	The referral identifies that water will be required for the project, however the source of water is not identified. The proponent is advised to provide details about the water source that will be used. If water is to be sourced from local aquifers, a groundwater resource assessment should also be undertaken in relation to water availability and suitability. If water is to be sourced from reticulated water systems or a licensed supplier, no further information is required. Although there are exemptions for roadworks regarding interference with a waterway and taking water, these are not exemptions from the requirement to manage and use water resources sustainably in accordance with the *Water Act 1992* and relevant NT Government policy. The NT Water Allocation Planning Framework provides guidance that for surface water, no more than 20% of instantaneous flow can be taken; and no more than 20% of annual recharge can be taken for groundwater. The construction of the road should be designed to maintain natural flow regimes upstream and downstream of the road crossing the drainage lines and drainage of water from the road itself.
Appendix D & Appendix E		Both appendices provide information on how environmental management and erosion and sediment control works will be undertaken using guidelines, however there is very little site specific detail to assess. The impact on environmental and cultural values is not assessed in the referral, and no mitigation measures have been identified.
Section 6.0	EIA Site rehabilitation	The main referral document does not include details about the rehabilitation of surface water hydrology or about the protection of water quality that may be impacted by vegetation clearing or the construction of gravel pits. While this this is covered in some detail in the appendices, a summary should be provided in the main report.

Rangelands Division

Weed Management Branch

Observations from historical site visits and data compiled from the NT Weeds Database, surrounding areas and adjoining roads provided the following records of declared weeds:

Common Name	Botanical Name	Declared
gamba grass	*Andropogon gayanus*	Class A
mimosa	*Mimosa pigra*	Class A
ornamental rubber vine	*Cryptostegia madagascariensis*	Class A
chinee apple	*Ziziphus mauritiana*	Class A
perennial mission grass	*Cenchrus polystachios*	Class B
hyptis	*Hyptis suaveolens*	Class B
sida - flannel weed	*Sida cordifolia*	Class B
sida - spiny head	*Sida acuta*	Class B
senna - coffee	*Senna occidentalis*	Class B
senna - candle bush	*Senna alata*	Class B
snakeweed sp.	*Stachytarpheta sp.*	Class B

The *Weeds Management Act 2001* (the Act) enables the following weed declarations: Class A (to be eradicated); Class B (growth and spread to be controlled); and Class C (not to be introduced into the NT). All Class A and B weeds are also Class C.

All land is the Northern Territory is subject to the Act. The Act states that the owner and occupier of land must (a) take all reasonable measures to prevent the land being infested with a declared weed; and (b) take all reasonable measures to prevent a declared weed or potential weed on the land spreading to other land.

Gamba grass, mimosa and chinee apple are subject to Statutory Weed Management Plans. Management obligations outlined in the plans must be adhered to by all landholders.

Any works that cause disturbance to vegetation and soils will create conditions favourable for the growth of weed species and control should be undertaken as necessary. Weed control prior to seed set should be carried out in all areas affected by the proposed project area.

The proponent will need to ensure that all vehicles and machinery are free of weeds, weed seeds, soil and vegetative material prior to entering or exiting the site, whether the equipment is sourced locally or elsewhere. Vehicles must avoid driving through weeds already present on-site to prevent further spread. Vehicles and machinery exhibiting such material must be thoroughly washed down before entering/departing.

It is imperative the operation maintains machinery hygiene and ongoing weed management along roads, access tracks and stockpiles for the life of the project and rehabilitation period.

The Weed Management Branch may conduct random inspections of the area to ensure weeds have not been spread or introduced.

Further information about management requirements and a copy of the Weed Management Plans for gamba grass, mimosa and chinee apple are available at: www.nt.gov.au/environment/weeds. Alternatively contact the Weed Management Branch for further advice on (08) 8999 4567.

Section 3.4 of the referral adequately identifies weed management concerns and has listed appropriate management actions to minimise/prevent the spread of weed species into and within the project area. All weed management actions proposed in section 3.4 are to be undertaken as stated.

Vegetation Assessment Unit

Section of Referral	Theme or issue	Comment
Main Report - 1.5 Project Description	Permitting for clearing of native vegetation (Section 3.2.1 of NT Planning Scheme)	The referral indicates that up to 60.3ha of native vegetation will be cleared in total for borrow pits within five areas, the largest area being 34ha. This will likely result in more than one instance of clearing native vegetation for final borrow pits being more than 1ha in size, despite the referral stating that 'gravel pits should not exceed 1ha' and 'extraction areas are to be progressively rehabilitated so that one gravel pit is rehabilitated before another one is established'. The Northern Territory Planning Scheme 2020 (NTPS) does not prevent the construction, operation, alteration, repair or maintenance of a road or main road. Section 3.2.4 of the NTPS states that consent for clearing is not required if the clearing of native vegetation is required or controlled under any Act in force in the Territory, or is for the purpose of a road to access the land or other land. However, this exception for clearing for roads does not include clearing for gravel pits. As per Section 3.2.1 of the NT Planning Scheme, clearing of more than one hectare of native vegetation in aggregate requires consent before clearing. It is recommended that the proponent review the information available on the DEPWS website regarding clearing of native vegetation in unzoned land, including the Land Clearing Guidelines - https://nt.gov.au/property/land-clearing/freehold-land/apply-to-clear-freehold-land as the proposed clearing for gravel pits requires permitting under the *Planning Act 1999*.

Land Management Unit

Section of Referral	Theme or issue	Comment
Main report – Section 1.5.	Gravel Pit Management	The proponent has identified adherence to the DIPL Standard Specification for Environmental Management for materials extraction activities within gravel pits, specifically Section 19.1. However, Section 19.1 does not require a Pit Management Plan to be developed, instead Section 19 states that a plan *may* be required for large or high risk projects. Given the extent of disturbance proposed and the potential high risk of erosion the Land Management Unit recommends that a Pit Management Plan must be developed for the project prior to undertaking any clearing or ground disturbing activities. The management plan should include but not be limited to: • Identify the locations, accesses, slope gradient, number and dimensions of the pits • Clearing plans, including timing and staging of works and clearing method(s) • Minimum requirements for retained native vegetation buffers between pits

		• Details regarding the maximum allowable slope for gravel extraction areas • Application of native vegetation buffers as per the Land Clearing Guidelines (LCG) • Rehabilitation requirements, including information regarding the proposed final landform, timing of works, maintenance and monitoring requirements, contingency planning should proposed assisted natural revegetation (ANR) fail to provide adequate vegetation cover, and rehabilitation completion criteria. The Pit Management Plan should reference and interface with the Erosion and Sediment Control Plan (ESCP) developed for the project.
Main report Section 3.1.4 Hydrology Surface Water Appendix E	Stream Buffers	• Land resource information indicates the presence of a number of first order streams and associated drainage lines within the proposed gravel pit areas. The proponent must ensure that native vegetation buffers to waterways are maintained in accordance with Land Clearing Guidelines.
2.0 Project Area Erosion Susceptibility	Slope	• Land resource information indicates that there are significant areas of slope potentially between 3% and 20% occurring to the south of the road alignment within the proposed Gravel Pit 1 Project Area and areas of 3-5% and >5% slope in the northwest of Gravel Pit 2 Project Area. The LCG consider constraints where slope is >3% to be very high to extreme and can only be overcome with major management and/or engineered solutions. The LGC also state that the level of management required to manage erosion on slopes >3% is prohibitive and do not recommended clearing these areas. Figures 13 and 14 in appendix A (Terrestrial Biodiversity Survey part 2) identifies five locations suitable for gravel pits (GP1-1 to GP1-2, GP1-3 GP2-1 and GP2-2). Gravel pit locations were chosen (amongst other considerations) in areas of 0-6% slope. However, the application does not identify where individual 1ha gravel pits are to be located. This information should be clearly identified in the Pit Management Plan and Erosion and Sediment Control plan (ESCP).
	ESCP	• The Land Management Unit consider the risk of erosion resulting from the proposed works, including the realignment of sections of Paru Road and the development of approximately 60.3ha of gravel pits, to be high. Due to the size, type of works, location (within and adjacent to waterways and drainage lines and potentially clearing areas of slope >3%) the Land Management Unit recommends that an ESCP be developed and implemented. The ESCP must be developed by a Certified Professional in Erosion and Sediment Control (CPESC) to the satisfaction of the DIPL Engineering and Environment Services. The locations of individual gravel pits within the two proposed gravel pit project areas should be confirmed prior to the finalisation of the Pit Management Plan and ESCP. Erosion and sediment control measures must be effectively implemented throughout the construction phase of the development (including clearing and early works) and all disturbed soil surfaces must be satisfactorily stabilised against erosion at completion of works.

Environment Division
Environmental Operations Unit

Section of Referral	Theme or issue	Comment
Appendix D: Construction Environmental Management Plan Framework	3.1 Erosion and Sediment Control	The proponent must ensure that no polluted and/or sediment-laden run-off is discharged directly or indirectly into drains or watercourses. As identified in the Land Management Unit comment, the proponent must ensure that appropriate erosion and sediment control measures be effectively implemented throughout the construction stage of the development and all disturbed soil surfaces must be satisfactorily stabilised against erosion at completion of works. Information can be obtained from the IECA Best Practice Erosion and Sediment Control Guidelines 2008 available at www.austieca.com.au and the NTG website https://nt.gov.au/environment/soil-land-vegetation. The proponent must ensure that during the transportation of soil and/or other fill/excavated material from and to the subject works: a) all vehicles hauling soil or fill/excavated material have their loads secure and covered b) any spillage that falls from the vehicles or their wheels is collected and removed from the subject project works and roads along which the vehicles travel, and c) prior to vehicles exiting the premises, measures are taken to remove soil from the wheels of the vehicles to prevent soil and mud being deposited on public roads.
Appendix D: Construction Environmental Management Plan Framework	3.3 Waste	The project has the potential to generate fill (waste material) and/or involve the importation of fill for use on-site. Prior to the removal of fill (waste material) from the project works, or the importation of fill onto the works, the proponent must undertake waste classification assessment in accordance with NSW EPA Waste Classification Guidelines, Part 1: Classifying Waste, 2014, and associated waste classification guidelines, available at http://www.epa.nsw.gov.au/your-environment/waste/classifying-waste/waste-classification-guidelines. All imported fill material must be virgin excavated natural material (VENM). The material must be accompanied by details of its nature, origin, volume, and transportation details. It is also recommended that the proponent takes notice of the NT EPA fact sheets How to avoid the dangers of accepting illegal fill onto your land and Illegal Dumping - What You Need To Know, available at https://ntepa.nt.gov.au/publications-and-advice/environmental-management.
Appendix D: Construction Environmental Management Plan Framework	3.9 Air Quality	Since Paru Road is unsealed, dust will be generated as a result of vehicle movements on the road during the Dry season. The proponent must apply appropriate dust management measures to ensure there are no emissions of dust beyond the boundary of the subject project works.

Section of Referral	Theme or issue	Comment
Appendix D: Construction Environmental Management Plan Framework	3.10 Noise and Vibration	The proponent is to ensure that the noise levels from the subject project works comply with the latest version of the Northern Territory Environment Protection Authority Northern Territory Noise Management Framework Guideline available at https://ntepa.nt.gov.au/waste-pollution/guidelines/guidelines.
Environmental Management	General Environmental Duty	The proponent must comply with the General Environmental Duty under the *Waste Management Pollution Control Act 1998* (WMPC Act). Guidelines to assist proponents to avoid environmental impacts are available on the NT EPA website at https://ntepa.nt.gov.au/publications-and-advice/environmental-management.

Yours sincerely

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