

Kylie Fitzpatrick
Department of Environment, Parks and Water Security
Floor 1, Arnhemica House,
16 Parap Road, Parap

Dear Ms Fitzpatrick

Re: Melville Island Road Upgrades - Referral *Environment Protection Act 2019* (EP Act)

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

Tiwi –Cobourg Bioregion: Melville Island is situated within the Tiwi-Cobourg Bioregion, with a total area of approximately 1.01 million hectares. Current figures for cumulative loss of native vegetation cover within the Tiwi-Cobourg Bioregion indicate that approximately 40 007 hectares 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 is largely focused on the most commonly occurring woodland vegetation types within the bioregion (*Eucalyptus miniata*, *Corymbia nesophila* and *E. tetradonta* woodlands with variable perennial tussock grass ground layer), which represent over 70% of the intact savannah woodlands within the Bioregion. Flora and Fauna consider that the proposed clearing associated with the project, representing less than 0.02% of the regional extent of these ecosystems, is unlikely to contribute significantly to the loss of biodiversity or ecological integrity within the Bioregion.

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

Common Name	Scientific Name	TPWC Act	EPBC Act
Red Goshawk	<i>Erythrotriorchis radiatus</i>	Vulnerable	Vulnerable
Masked Owl	<i>Tyto novaehollandiae (melvillensis)</i>	Endangered	Endangered
Partridge Pigeon	<i>Geophaps smithii smithii</i>	Vulnerable	Vulnerable
Northern Brush-tailed Phascogale	<i>Phascogale pirata</i>	Endangered	Vulnerable
Butlers Dunnart	<i>Sminthopsis butleri</i>	Vulnerable	Vulnerable
Northern Brushtail Possum	<i>Trichosurus vulpecula arnhemensis</i>	-	Vulnerable
Brush-tailed Rabbit-rat	<i>Conilurus penicillatus</i>	Endangered	Vulnerable
Black-Footed Tree Rat	<i>Mesembriomys gouldii</i>	Vulnerable	Vulnerable
Pale Field Rat	<i>Rattus tunneyi</i>	Vulnerable	-
Mertens' Water Monitor	<i>Varanus mertensi</i>	Vulnerable	-
Floodplain Monitor	<i>Varanus panoptes</i>	Vulnerable	-
Darwin Cycad	<i>Cycas armstrongii</i>	Vulnerable	-
A shrub	<i>Dendromyza reinwardtiana</i>	Vulnerable	-
A tree	<i>Endiandra limnophila</i>	Vulnerable	-
Climbing Pandanus	<i>Freycinetia excelsa</i>	Vulnerable	-
Climbing Pandanus	<i>Freycinetia percostata</i>	Vulnerable	-
An orchid	<i>Luisia corrugata</i>	Vulnerable	-
A vine	<i>Mitrella tiwiensis</i>	Vulnerable	Vulnerable
A tree	<i>Tarennoidea wallichii</i>	Vulnerable	-
Typhonium	<i>Typhonium jonesii</i>	Endangered	Endangered
Typhonium	<i>Typhonium mirabile</i>	Endangered	Endangered

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

Red Goshawk: Two Red Goshawks were observed during field surveys, one in the project area near Milikapiti and the other outside of the survey area. No nests were located during on ground surveys in likely nesting habitat, however surveys were undertaken outside of the breeding season.

The Flora and Fauna Division agree with the assessment that the clearing of potential foraging habitat would unlikely result in a reduction of the Tiwi Islands population. However, the small size of the gravel pits open at any one time (1ha) indicates that pre-clearance surveys would be feasible. The Flora and Fauna Division recommends pre-clearance surveys for Red Goshawk nests if vegetation clearing is occurring during the

breeding season (August-November). The Division proposes a 100 m buffer of native vegetation around any located nest sites to avoid nest disturbance.

Masked Owl: No systematic surveys were conducted for Masked Owls based on the reasonable assumption that they forage widely across the project area. Masked Owls were recorded three times opportunistically and historical records also indicate that a number of territories may overlap the proposal. No surveys were undertaken to identify potential breeding or roost sites for the species.

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 to be low given the spatial spread of the cleared areas and small area of woodland cleared for each gravel pit at any one time.

However, there is some uncertainty about whether tree hollows, for which Masked Owls have relatively specific requirements, are limited on the Tiwi Islands. The Division agrees with the recommendation that specific counts of large trees (DBH >40cm) are undertaken in and around the 1 ha gravel pits and further recommend that clearing of any relatively dense stands of large trees is avoided through shifting pit locations if feasible.

Partridge Pigeon: There were 89 detections of Partridge Pigeons during the surveys. Partridge Pigeon 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 Flora and Fauna Division consider it unlikely that the project would lead to a significant impact upon the Tiwi Islands population of Partridge Pigeon.

Northern Brushtail Possum: This species was detected from 72 of 100 camera traps deployed, and in all but one of the 17 map areas. There are >6,000 records of this species from the Tiwi Islands in the NT Fauna Atlas.

Given their widespread occurrence on Melville Island, and the relatively small area of vegetation clearing at each site within the project area, the Flora and Fauna Division agrees with the assessment that the project is unlikely to significantly impact the Melville Island population of this species.

Brush-tailed Phascogale: This species was detected from four cameras in three map areas. Given this species is generally difficult to detect, it is possible it also occurs in areas where it was not recorded.

The Flora and Fauna Division agrees with the recommendation of a 200 m buffer around any records of Brush-tailed Phascogales. Key habitat for this species is believed to be large trees (40 – 70+ cm DBH), with rough bark (*Eucalyptus tetrodonta* is slightly favoured) and tree hollows for daytime shelter. Uncertainty about potential impacts on this species by the proposal could be addressed by quantifying the density of large (DBH>40 cm) and very large (DBH>50cm) trees within and around the development footprint. This is discussed further under “sensitive/significant vegetation” below.

Butler’s Dunnart: No Butler’s Dunnarts were confirmed during field surveys, including intensive pitfall trapping. Five dunnarts detected by cameras appeared to be Butler’s Dunnarts (due to the lack of rufous colouring on the face and smaller body size than the Red-cheeked Dunnarts photographed) and were classified as ‘suspected’ Butler’s Dunnarts. The species has been recorded across most of Melville Island except in the far east and southwest. Currently, the population structure is unknown and may comprise one large connected population or several disjunct populations in areas of suitable habitat. Sparse data for this species makes it difficult to contextualise the significance of these records from both a regional and population perspective.

However, none of the suspected Butler's Dunnarts records were located in the disturbance footprint and all are a minimum distance of 200 m from the area of proposed clearing. The Division agree with the assessment that the project is unlikely to significantly impact the Tiwi Islands population of Butler's Dunnart.

Brush-tailed Rabbit-rat: This species was detected from three cameras only in the survey area closest to Pirlangimpi. The area of clearing required for the proposed gravel pits in this location is ~35 ha.

The Flora and Fauna Division agrees with the recommendation of a 200 m of no clearing around Brush-tailed Rabbit-rat detections. The Flora and Fauna Division also agrees that the species is unlikely to occur in the southern areas of the project given no detections during targeted sampling and the absence of historical records. The Flora and Fauna Division recommends further reducing risk of impacts to the Brush-tailed Rabbit-rat by removing or relocating gravel pit 1 (GP_1; 3.5 ha) to south of the road in the corner created by GP2_1 and GP2_2. This removes the need for vegetation clearing in the proximity of the two camera trap records north of the road and places it in an area with no detections across six cameras.

Black-footed Tree-rat: Black-footed Tree-rats were recorded widely across 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 the mainland populations suggests home ranges vary between c. 27 ha and c. 67 ha 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: This species was detected across five map areas of the project area. 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). The current distribution and microhabitat requirements of this species on Melville Island are not 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 local sub populations within a regional context.

Given the recorded declines and the possibility of an important sub-population on Melville Island, the Flora and Fauna Division recommends that a 100 m no-clearing buffer is established around all locations where the Pale Field Rat was detected during field surveys. Where this recommendation results in shifting a gravel pit into an unsurveyed area, more targeted sampling may be required. While the road alignment should also avoid areas where Pale Field Rat 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.

Floodplain Monitor, Mertens' Water Monitor: A single incidental record of Mertens' Water Monitor was made on a road in the Map 6 area. 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, given the extent of disturbance compared to the regional area of suitable habitat.

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.

High density cycad patches were identified in Map 13 and at water point PR7. The Division agrees with the recommendation of avoiding these high density patches through pre-clearance and micro-siting surveys (Section 11). With these measures in place, it is unlikely that the relatively small area of clearing associated with this project would result in a significant impact to this species at the regional scale.

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. A total of 1,212 *T. jonesii* individuals and 772 *T. mirabile* individuals were detected during targeted surveys. Sixteen *T. jonesii* located within the water point in map area 12 will be excluded from the cleared area (confirmed by DIPL). A total of nine located *T. jonesii* will be removed from throughout the project area, representing a loss of <0.5% the global known population. Two *T. mirabile* individuals within the water point area of map area 5 will be excluded from the cleared area (confirmed by DIPL). There are no known *T. mirabile* within disturbance footprint.

The proponent has assessed that the potential proposal is not likely to have a significant impact based on the significant impact guidelines for the *Environment Protection Biodiversity Conservation Act* (EPBC Act). The Flora and Fauna Division generally agree with this interpretation.

It is noted that 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 be significant in the shorter term, 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 ultimately occur as a result of the works.

The proponent utilised existing vegetation mapping available for the project area to identify potentially sensitive and/or significant vegetation types as per the NT Land Clearing Guidelines. Two sensitive and/or significant vegetation communities were identified within the project area: 1) W1a - a drainage depression community containing elements of riparian vegetation, and 2) W2a - a sand sheet heath community. The Flora and Fauna Division agrees with the recommendation of a 100 m no clearing buffer around these vegetation communities as per the current proposed avoidances and cleared areas.

Section 6.2.2 of the Threatened Species 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>40 cm) 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. Alternatively if there are patches with high densities of very large trees within the project area, it may be possible to relocate some elements of the project to avoid these.

There are a large number of threatened 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 Flora and Fauna 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:

- Pre-clearance surveys for Red Goshawk nests are undertaken if vegetation clearing is occurring during the breeding season (August-November). The Division proposes a 100 m buffer around any located nest sites to avoid nest disturbance.
- Further reduce risk of impacts to the Brush-tailed Rabbit-rat by removing or relocating gravel pit 1 (GP_1; 3.5 ha) to south of the road in the corner created by GP2_1 and GP2_2. This removes the need for vegetation clearing from the proximity of the two camera trap records north of the road and places it in an area with no detections across six camera traps.
- Implement a 100 m no clearing buffer around all locations where the Pale Field Rat was detected during field surveys.
- Provide further detail on the content and duration 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.
- Undertake additional sampling to assess the density of large (DBH>40 cm) 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.

Environment Division

Please note that the Environment Division in the Department provides support to the NT EPA and the Minister for Environment in administering the Environment Protection Act. Officers in the Environment Division support the NT EPA to identify, assess and mitigate the risk of significant environmental impacts and also enforce environmental approvals that are approved by the Minister. In that regard, this Departmental submission does not reflect all Departmental assistance provided to the NT EPA.

Water Resources Division

The proposed works are not located within a water control district or water allocation plan area. Accordingly, no permit is required for investigative drilling, bore construction and work on an existing bore. However, all bore work must be undertaken by an NT licensed driller in accordance with the Minimum Construction Requirements for Water Bores in Australia. The final Statement of Bore must be provided to Water Resources via email to water.regulation@nt.gov.au.

The proponent must be aware of the Power and Water 'bore protection zones' when constructing new bores for the completion of the project.

The proponent has advised: "...approximately 200 kL / day of water will be required for the road works. It is estimated that the earthworks and pavement works will take approximately 6 months per year, which equates to approximately 36ML of water. When considering spillage and dust suppression, this volume will increase"

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

However, if the advised volume of water is expected to vary from the volumes provided then the Department should be notified.

Rangelands Division

Weed Management Branch

An assessment of the NT Weeds Database for the sites and surrounding areas and adjoining roads revealed historic data records of the following declared species:

Common name	Botanical Name	Declared
Gamba grass	<i>Andropogon gayanus</i>	Class B
Bellyache bush	<i>Jatropropha gossypiifolia</i>	Class A and B
Rubber vine	<i>Cryptostegia madagascariensis</i>	Class A
Mimosa	<i>Mimosa pigra</i>	Class B
Mission grass - perennial	<i>Cenchrus polystachios</i>	Class B
Hyptis	<i>Hyptis suaveolens</i>	Class B
aAtana	<i>Lantana camara</i>	Class B
Senna - coffee	<i>Senna occidentalis</i>	Class B
Senna - sicklepod	<i>Senna obtusifolia</i>	Class B
Sida - paddys lucerne	<i>Sida rhombifolia</i>	Class B
Sida - flannel weed	<i>Sida cordifolia</i>	Class B
Sida - spiny head	<i>Sida acuta</i>	Class B
Snake weed sp	<i>Stachytarpheta sp</i>	Class B
Mossman river grass	<i>Cenchrus echinatus</i>	Class B

Of the listed species, gamba grass spread is of particular concern and is subject to a statutory weed management plan. Gamba grass and mission grass are identified as part of the listed key threatening process 'Invasion of northern Australia by Gamba Grass and other introduced grasses'.

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

All land in the Northern Territory is subject to the WM Act. Section 9 of the WM 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; (b) take all reasonable measures to prevent a declared weed or potential weed on the land spreading to other land.

Gamba grass (*Andropogon gayanus*), mimosa (*Mimosa pigra*) and bellyache bush (*Jatropha gossypifolia*) are subject to statutory weed management plans. All landholders and managers must adhere to management obligations outlined in these plans.

The following issues are raised in relation to this referral and should be considered:

- Melville Island has a lower density of weeds compared to other parts of the Northern Territory and any proposed works should seek to ensure there is no introduction of new weeds and that the spread risk of known weeds on the island is addressed.
- The species *Andropogon gayanus*, *Cenchrus polystachios*, *Cenchrus pedicellatus* are identified as components of the Key Threatening Process 'Invasion of northern Australia by Gamba Grass and other introduced grasses' listed under the EPBC Act.
- There is a general obligation under the *Weed Management Act* to control weeds on land, this extends to reasonable steps to contain or control seed production and spread from infested areas.

The Weed Management Branch recommend the following:

- Section 7.1.4.1 Biosecurity mitigation - Potential borrow pits and roadsides that form a part of upgrades should be surveyed for weeds prior to clearing and/or use and any mitigations are included in the Weed Management Plan. This includes treatment and control to prevent seed contamination of soil removed and transported from the sites.
- Section 8. Rehabilitation and Closure - include a schedule of surveillance of disturbed sites (roadsides and borrow pits) to ensure there has not been weed establishment/and or spread once sites are rehabilitated. Surveillance should be carried out up to and including flowering and seeding time and before fire.

Appendices E CEMP minus AAPA

- Section 14.2.6 Weed Management - Please delete the following point - [Witness Point-The use of hay bales on site can only occur if documentary evidence is provided demonstrating that the hay bales are certified weed free and written approval is received from the DIPL Superintendent. In general, the use of hay bales for environmental control is not supported.] - Given the high risk for weed spread through hay bales, no hay bales should be introduced to the Island.

Preventing Weed Spread is Everybody's Business is a document produced to highlight the areas of risk for all activities associated with weed spread. The document¹ details the pathways through which weeds are

¹ https://denr.nt.gov.au/_data/assets/pdf_file/0011/257987/preventing-weed-spread.pdf

spread and provides actions to reduce weed spread. Proponents seeking to develop land for any purpose should address these actions.

Further management requirements and copies of the Weed Management Plans for gamba grass, mimosa and bellyache bush are available online². Alternatively contact the Weed Management Branch for further advice on (08) 8999 4567.

In conclusion to this letter, 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
A/Executive Director Rangelands

30 June 2022

² <https://nt.gov.au/environment/weeds/weed-management-planning>

Kylie Fitzpatrick
Department of Environment, Parks and Water Security
Floor 1, Arnhemica House,
16 Parap Road, Parap

Dear Ms Fitzpatrick

Re: Melville Island Road Upgrades - Referral *Environment Protection Act 2019* (EP Act)

The Department of Environment, Parks and Water Security (DEPWS) has assessed the information contained in the above referral and provides the following comments in addition to the previous comments provided by DEPWS on the letter dated 30 June 2022.

Rangelands Division

The comments from the Land management Unit and the Vegetation Assessment Unit are provided in Appendix 1 and Appendix 2 of this letter.

In conclusion to this letter, should you have any further queries regarding these comments, please contact the Development Coordination Branch by email DevelopmentAssessment.DEWPS@nt.gov.au or phone (08) 8999 4446.

Yours sincerely



Maria Wauchope
A/Executive Director Rangelands

4 July 2022

APPENDIX 1 – Land Management Unit Comments

Section of Referral	Theme or issue	Comment
Main report – Section 3.3.4 and 7.1.1	Gravel pit management.	<p>Land resource information and the Topography and slope Maps 5-8 included in the referral indicate there are significant areas of slope potentially between >3% and >6% occurring within the proposed gravel pits. The Land Clearing Guidelines 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 Land Clearing Guidelines also state that the level of management required to manage erosion on slopes >3% is prohibitive and do not recommended clearing these areas.</p> <p>The proponent has identified further refinement of final gravel extraction pit locations and extents will be undertaken and “...preference will be given for areas with less than 2% slope where possible, however, depending on the availability and quality of gravel material, areas with up to 6% slope may be utilised with increased ESC measures”. This is supported and it is recommended that no clearing for gravel pits is approved in areas greater than 6% and the increased erosion and sediment controls mentioned in the application and potentially additional rehabilitation measures are detailed in the Pit Management Plans for slopes greater than 2%.</p> <p>The referral identifies that “actual gravel extraction will only occur from 1 ha at a time within the proposed gravel pit areas” (Section 3.3.4), however there is no mention of retained vegetation buffers between pits. Limiting pits to maximum 1ha is supported and implementation of retained vegetation buffers is recommended.</p> <p>The referral identifies that the “Contractor will be required to submit a Gravel Pit Management Plan to DIPL for assessment and endorsement” and “the gravel pit rehabilitation program will be largely governed by the principals detailed within DIPLs standard specification for environmental management, version 2.0 (DIPL, 2019)”. Given the extent of disturbance proposed and the potential high risk of erosion the Land Management Unit of Department of Environment, Parks and Water Security (DEPWS) recommends that Pit Management Plans must be developed for the project prior to undertaking any clearing or ground disturbing activities. The pit management plans should include but not be limited to;</p>

	ESCP	<ul style="list-style-type: none"> • All requirements for gravel extraction identified in the Standard Specification for Environmental Management, Version 2.0 (DIPL, 2019); • Identifying the locations, accesses, slope gradient, number and dimensions of each pit; • Clearing plans including timing and staging of works and clearing method(s); • Minimum requirements for retained native vegetation buffers between 1ha pits; • Details regarding the maximum allowable slope (6%) for gravel extraction areas; • Application of buffers as per the Land Clearing Guidelines (LCG); and • 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. <ul style="list-style-type: none"> • It is noted the construction works are aimed to be undertaken in the Dry season (April to October, Section 3.5.2). The referral states <i>“with any works outside of this period, the Contractor will be required to develop and implement an approved Erosion and Sediment Control Plan”</i>. <ul style="list-style-type: none"> • The Land Management Unit consider the risk of erosion resulting from the proposed works and the development of gravel pits to be high. Due to the size, type of works, potentially clearing areas of slope >3% the LMU recommends that an Erosion and Sediment Control Plan (ESCP) and Pit Management Plan (PMP) be developed and implemented irrespective of whether the works are programmed for the dry or wet season. The ESCP should be developed by a Certified Professional in Erosion and Sediment Control (CPESC) to the satisfaction of the DIPL Engineering and Environment Services. <ul style="list-style-type: none"> • The locations and extents of individual gravel pits 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, early works, construction phase, extraction operations and rehabilitation) and all disturbed soil surfaces must be satisfactorily stabilised against erosion at completion of works.
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APPENDIX 2 – Vegetation Assessment Unit Comments

Section of Referral	Theme or issue	Comment
Main report – Figures 3-6.	NT Planning Scheme Clause 3.2.5(e) – avoid impacts on highly erodible soils	<ul style="list-style-type: none"> Proponent mapping (Appendix B Maps 1-16) indicates slope $\leq 3\%$ within the proposed gravel pits. Further, the main report (pg 15) indicates slopes of up to 6% may be utilised 'with increased erosion and sediment control (ESC) measures. The NT Planning Scheme Land Clearing Guidelines consider the erosion risk associated with slopes $>3\%$ as a very high, and do not recommend clearing given the management required. Proponent should demonstrate how erosion and sediment control issues will be managed, as per comment from Land Management Unit (Appendix 1).
Appendix B Maps 1-16 Appendix B - Section 6.2.2	NT Planning Scheme Clause 3.2.5(a) – avoid impacts on significant or sensitive vegetation	<ul style="list-style-type: none"> Two sensitive and/or significant vegetation communities were identified within the project area: 1) W1a – a drainage depression community containing elements of riparian vegetation, and 2) W2a – a sand sheet heath community. The proposed gravel pit areas avoid these communities via a 100 m no clearing buffer around these vegetation communities Stands of vegetation supporting high densities of large trees with hollows suitable for fauna habitat were identified within the proposed clearing footprint. The Flora and Fauna Division has recommended additional sampling be undertaken to assess the density of 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. Areas with relatively high densities of large hollow-bearing trees should be avoided where possible
	NT Planning Scheme Clause 3.2.6(b) – presence of threatened wildlife	<ul style="list-style-type: none"> A number of threatened species have potential to occur within/adjacent to the proposed clearing area. To reduce the risk of impact the proponent should adhere to the recommendations made by the Flora and Fauna Division, including: <ul style="list-style-type: none"> Pre-clearance surveys for Red Goshawk nests are undertaken if vegetation clearing is occurring during the breeding season (August-November). The Division proposes a 100 m buffer around any located nest sites to avoid nest disturbance. Further reduce risk of impacts to the Brush-tailed Rabbit-rat by removing or relocating gravel pit 1 (GP_1; 3.5 ha) to south of the road in the corner created by GP2_1 and GP2_2. This removes the need for vegetation clearing from the proximity of the two camera trap records north of the road and places it in an area with no detections across six camera traps. The Flora and Fauna Division recommend a 100 m no clearing buffer around all locations where the Pale Field Rat was detected during field surveys.