Appendix E

CEMP Framework

Contractors Environmental Management Plan Framework for Melville Island

Pirlangimpi and Pickertaramoor Road Upgrades Northern Territory RFT Number: (T2X-XXXX)

[Note:

- Red text throughout this document includes instructions for the Contractor in the development of a CEMP
- Blue text throughout this document includes site and project specific information that the Contractor should include in the CEMP
- This is a framework CEMP to be attached to the NT EPA Referral, to be used as a guide for the Contractor. The Contractor is to supply their own site and project specific CEMP prior to construction.]

INSERT COMPANY LOGO

NORTHERN TERRITORY GOVERNMENT

Controlled Document			
Project name	Pirlangimpi and Pickertaramoor Road Upgrades		
Project number			
Site address			
Project manager	(Name)	(Number)	
Authorised signature			
Site supervisor	(Name)	(Number)	
Environmental contact	(Name)	(Number)	
Issue date	(xx/xx/xx)	**Next review**	(xx/xx/xx)
Plan version			
Prepared by			

Amendments Register				
Date	Page/Section	Description of amendment	Prepared by	Approved by

Distribution List				
Date of issue	Version no.	Issued to	Approved by	Control status

ATTENTION: The intention of this document is to provide guidance with regards to information required in a Construction Environmental Management Plan (CEMP). Alterations to this document, including the addition of project specific information and deletion of irrelevant information, is required before it will be considered as meeting the required standard.

If there is any inconsistency between the information provided in this CEMP and any other document prescribing environmental management procedures applicable to the project, the more stringent requirements apply until and unless advised differently by the Superintendent.

Contents

1. Environment Policy

[Attach copy of company Environmental Policy]

[name of Contractor] will refer to the *DIPL Standard Specification for Environmental Management Version 2.0* in the development of the CEMP. This document is available here: Specifications for environmental management - Department of Infrastructure, Planning and Logistics

2. Background

2.1. Project Description

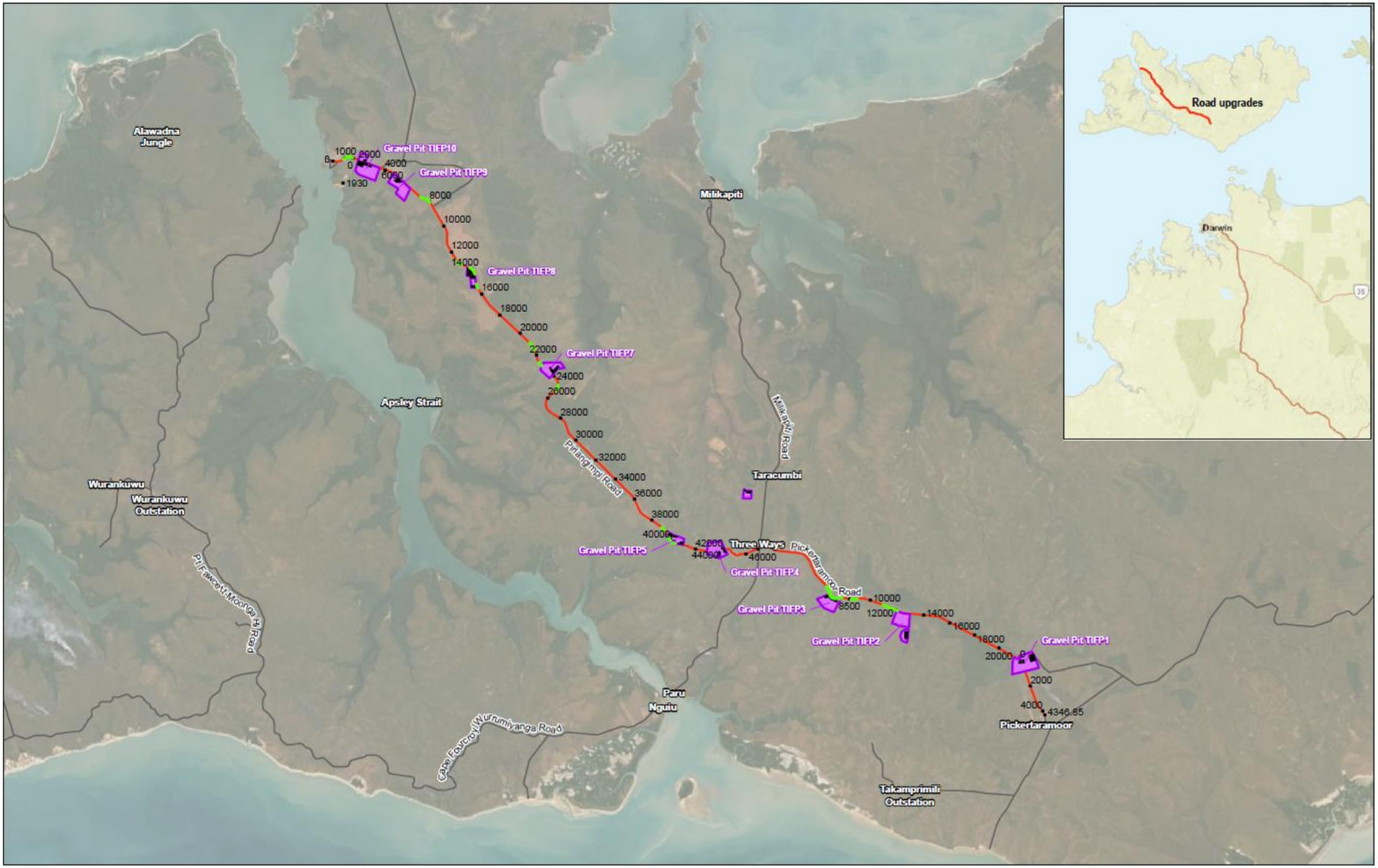
[Add a detailed Project Description and key associated environmental risks]

The Tiwi Islands Regional Council (TIRC) has been working together with the Northern Territory Government (NTG) to upgrade the Access Roads on Melville Island. The roads to be upgraded as part of this project are Pirlangimpi Access Road (47 km), Pickertaramoor Access Road (26 km). The upgrades will involve pavement lifts and re-gravelling, formation widening, realigning, installation of transverse drainage structures and overall, improving the flood immunity and rideability of the access roads. The project location and detail are shown in Figure 1 and Figure 2 below.

An initial assessment of the potential impacts was undertaken which assessed the likelihood and severity of consequence of each potential impact. Most potential impacts achieved a Low or Medium risk rating. No potential impacts resulted in a Severe risk consequence. A summary of the potential impacts that were considered to be a high risk at the initial assessment, along with a summary of the proposed mitigation measures and the residual risk after mitigation is provided at Table 1 below. **The full environmental risk assessment is provided at Appendix A of this CEMP.**

Table 1 Summary of Potential Impacts of High Risk

	Potential high risk impacts	Proposed mitigation and management measures	Residual risk after mitigation and management
Land	Pest species are introduced and established	A Weeds and Pest Management Plan will be developed and implemented during construction by the contractor. The plan will detail procedures that need to be adhered to ensure that no declared weeds are spread or introduced within the site for the duration of the works.	Medium
People	Unknown indigenous cultural heritage sites are disturbed or damaged during road construction, operation and/or decommissioning.	Should any item be encountered, which might be an artefact of heritage value or any relic, artefact or material which might be of Aboriginal or Torres Strait Islander origin, all construction work that might affect the item will cease and the contractor will protect the item from damage or disturbance.	Medium



Legend

- Road realignments
- Proposed gravel pit areas
- Potential gravel pit areas
- Road upgrades

1:250,000 @ A3

0 2.5 5 7.5 10

Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 52

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Department of Infraatructure, Planning and Logistics
Terrestrial biodiversity surveys for
Melville Island roads

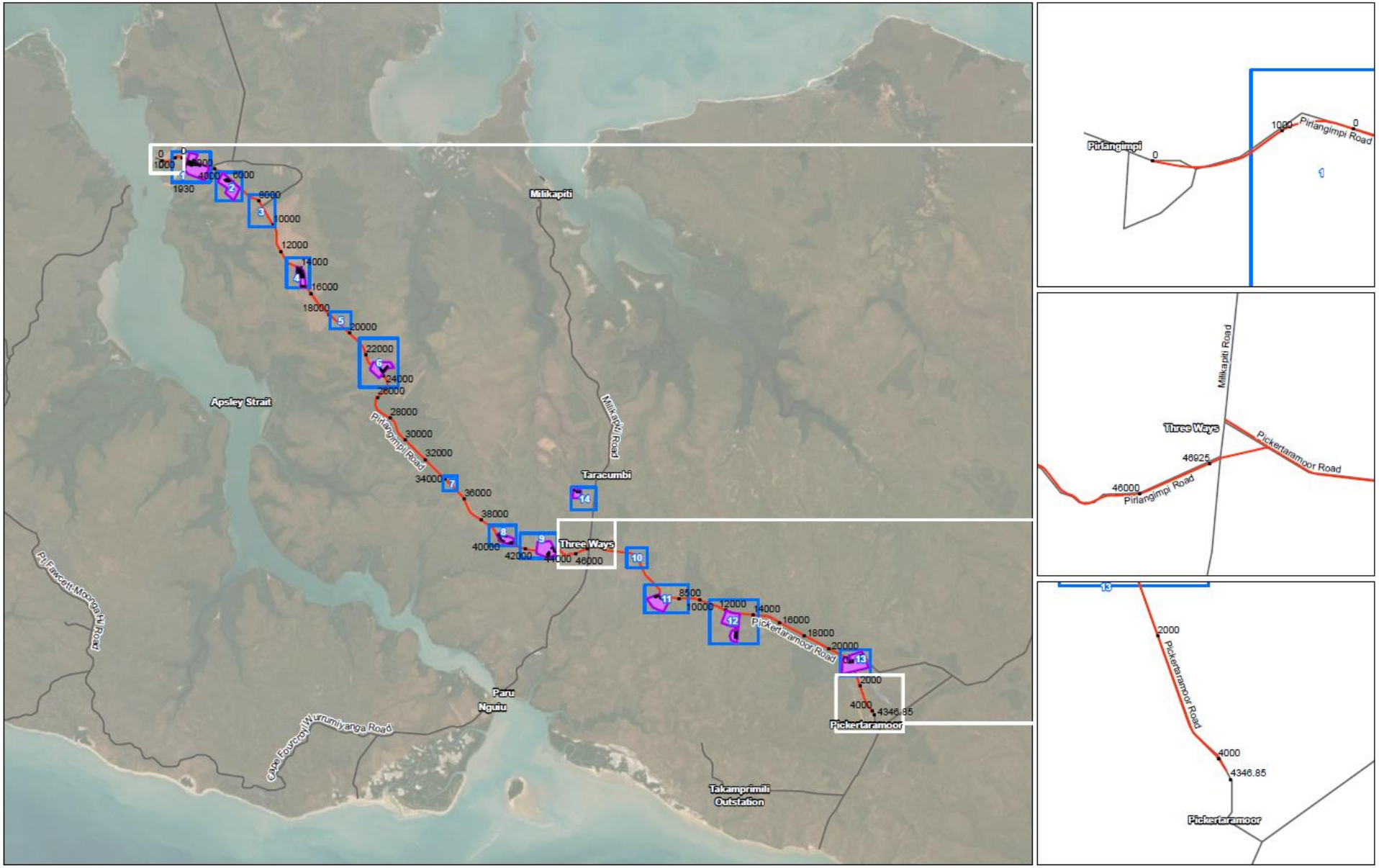
Project No. 12543964
Revision No. 0
Date 2/11/2022

Project Area, Melville Island, NT

FIGURE 1

G:\43\12543964\GIS\Maps\12543964_005.mxd
Print date: 11 Feb 2022 - 16:28

Data source: DIPL - Road upgrades, Gravel pits (2020); GA - place names, roads (2015); Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community. Created by: kafoo


Milikapiti
Apsley Strait
Taracumbi
Three Ways
Paru
Nguiu
Takamprimili
Outstation
Pickertaramoor
Pirlangimpi Road
Milikapiti Road
Pickertaramoor Road
Pt Fawcett-Moonga Hl Road
Cape Fourcroy/Wurrumiyanga Road
0
1000
1930
4000
6000
8000
10000
12000
14000
16000
18000
20000
22000
24000
26000
28000
30000
32000
34000
36000
38000
40000
42000
44000
46000
8500
12000
2000
4000
4346.85
Pirlangimpi
1000
46825
Legend
Proposed gravel pit areas
Potential gravel pit areas
Map areas
Road upgrades
1:250,000 @ A3
0 2.5 5 7.5 10
Kilometres
Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 52
N
Department of Infrastructure, Planning and Logistics
Terrestrial biodiversity surveys for
Melville Island roads
Road upgrades
Project No. 12543964
Revision No. 0
Date 2/11/2022
FIGURE 2

2.1.1. Detour

[Add detail if relevant – e.g. Where it is located (include in location map), clearing requirements, width, protection measures if around/through a waterway, timing for construction (outside of wet season flows), rehabilitation, approvals from Land Owner/DIPL, etc]

- A traffic management plan will be prepared by the appointed contractor to outline the proposed traffic management strategy to safely and efficiently manage traffic around the construction of the road. Considerations for this traffic management plan must include:
    - Road works will only be undertaken in the dry season of every year
    - Road closures will not be required, vehicles will be detoured along the existing table drains, which will be constructed and maintained in preparation for this purpose.
    - Detour design will include intersections and carriageways that are used by local communities and Plantation Forestry. They are therefore designed to cater for triple road-trains (53.0 m) and minimum service vehicles (8.8 m).

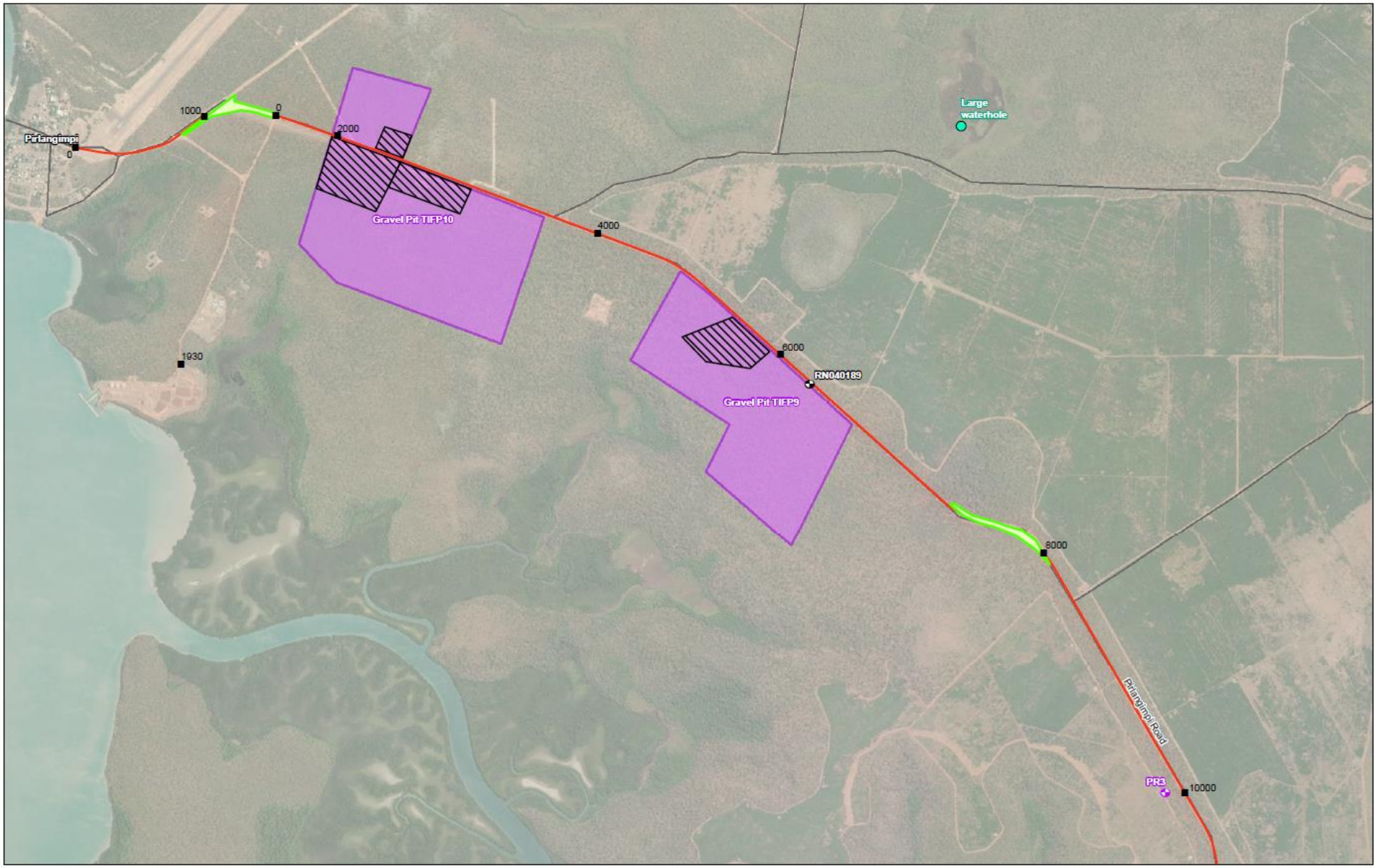
2.1.2. Mineral Extraction

[Add detail if relevant – Where pits are located (include in location map), approximate volumes required, clearing methodology, rehabilitation etc.]

The location for gravel pit extraction areas is shown in both Figure 1 and 2 above and in more detail in Figures 3, 4, 5 and 6 below.

- Tiwi Rangers are proposed to be utilised in any land clearing operations to confirm approval of clearing area prior to clearing being undertaken. A mineral extraction agreement with TLC has been established providing formal approval to clear and extract from the nominated gravel pit areas and includes reimbursement for extractives to the Council. [Name of Contractor} should provide copies of the agreements with the final CEMP.The Gravel Pit Management Plan will be developed by [name of Contractor] using relevant considerations appended to this CEMP framework, including:
    - Details on how [name of Contractor] plans to clear, work and rehabilitate pits during the life of the project.
    - Diagrams showing the pits to be used, location of stockpile sites, drainage lines and location and type of erosion and sediment controls,
    - Details regarding pit staging and rehabilitation.
    - During construction, gravel pit plans will be submitted to Tiwi Land Council for review and approval. Works will be ongoing during the dry season with preparation for erosion and sediment control during the wet season. This will involve only 1 ha of land cleared and rehabilitated at any one time within each gravel pit location.
    - Gravel extraction will occur at approximately 23 locations within the proposed gravel pit areas
    - Preference will be given to 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

- DIPL and its Contractors are committed to the progressive rehabilitation of each 1 ha gravel extraction area throughout the construction phase of the Project and beyond. This program is one of the key environment protection and management principles developed with the existing environmental conditions and associated key risks of the Project in mind.


Pirlangimpi
0
1000
0
2000
Gravel Pit TIFP10
4000
Large waterhole
1930
6000
RN040189
Gravel Pit TIFP9
8000
Pirlangimpi Road
PR3
10000
Legend
Existing bore
Proposed bore
Natural water body
Road upgrades
Road realignments
Proposed gravel pit areas
Potential gravel pit areas
1:25000 @ A3
0 0.25 0.5 0.75 1
Kilometres
Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 52
N
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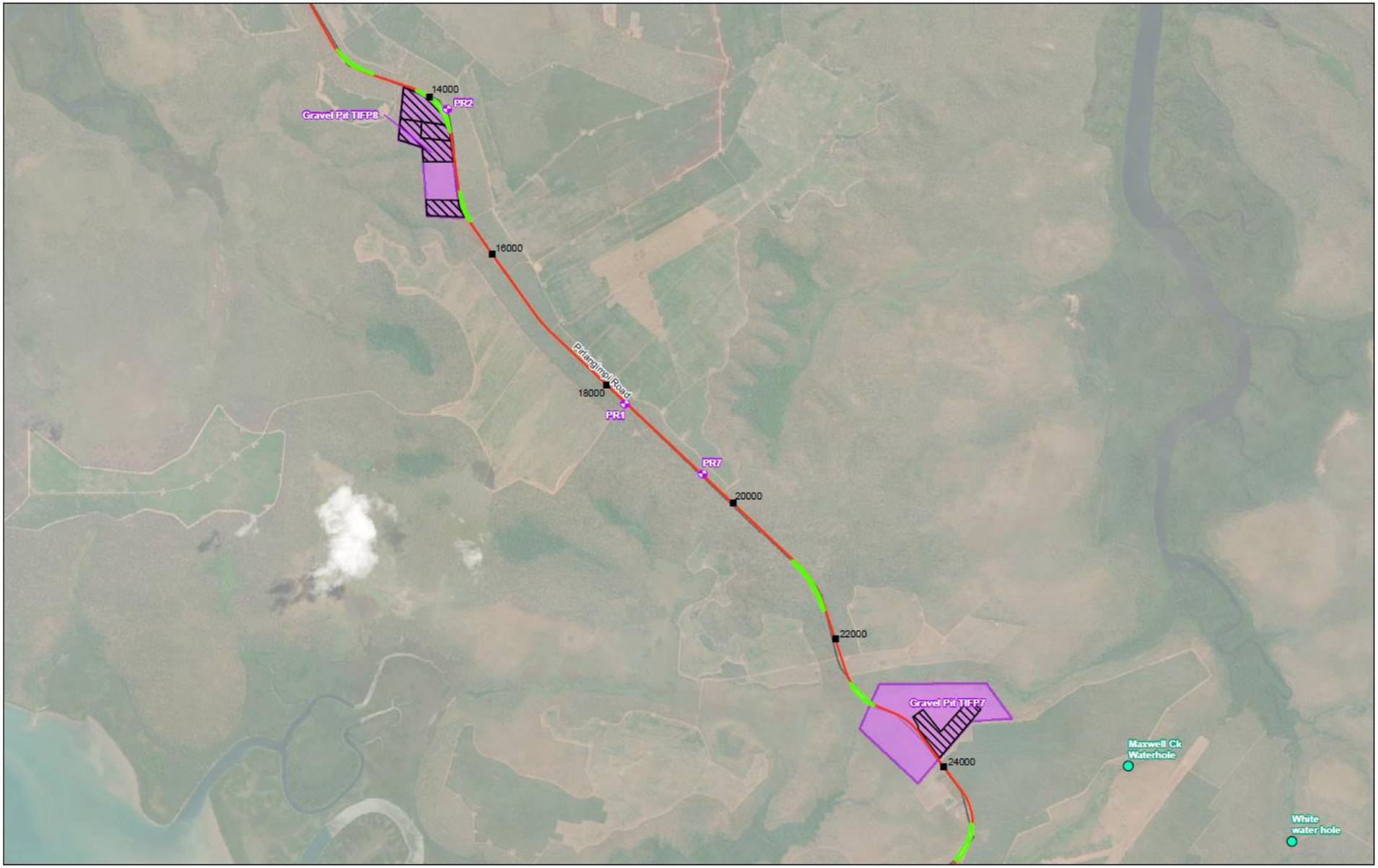
Department of Infrastructure, Planning and Logistics
Terrestrial biodiversity surveys for
Melville Island roads
Gravel pit areas and road realignment
Project No. 12543964
Revision No. 0
Date 20/02/2022
FIGURE 3


14000
PR2
Gravel Pit TIFP8
16000
Pirlangimpi Road
18000
PR1
PR7
20000
22000
Gravel Pit TIFP7
24000
Maxwell Ck Waterhole
White water hole
Legend
Proposed bore
Natural water body
Road upgrades
Road realignments
Proposed gravel pit areas
Potential gravel pit areas
1:40000 @ A3
0 0.45 0.9 1.35 1.8
Kilometres
Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 52
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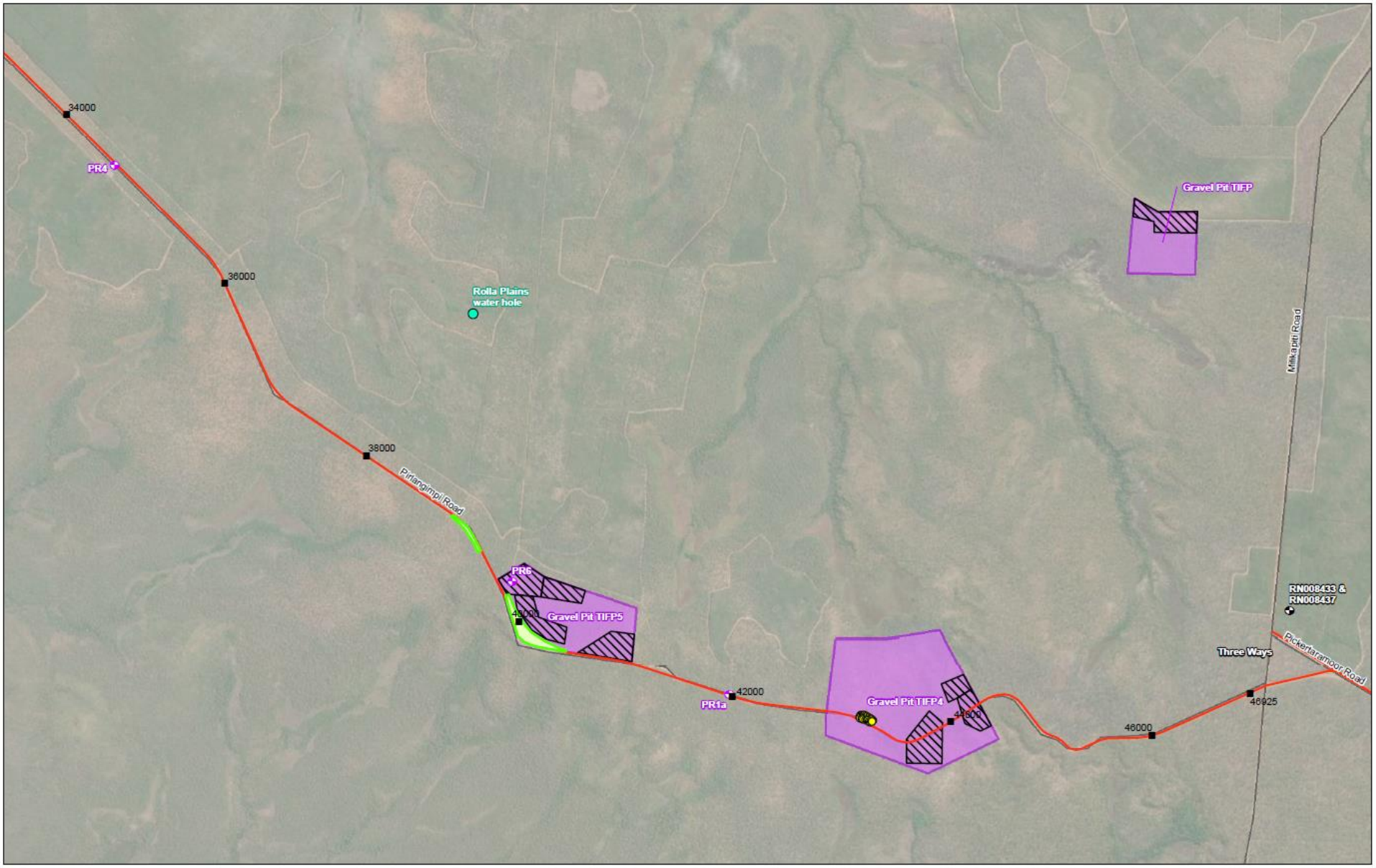
Terrestrial biodiversity surveys for
Melville Island roads
Gravel pit areas and road realignment
Project No. 12543964
Revision No. 0
Date 20/02/2022
FIGURE 4



Legend

- Munupi Yellow Ochre Track
- Existing bore
- Proposed bore
- Natural water body
- Road upgrades
- Road realignments
- Proposed gravel pit areas
- Potential gravel pit areas

1:30000 @ A3
0 0.35 0.7 1.05 1.4
Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 52

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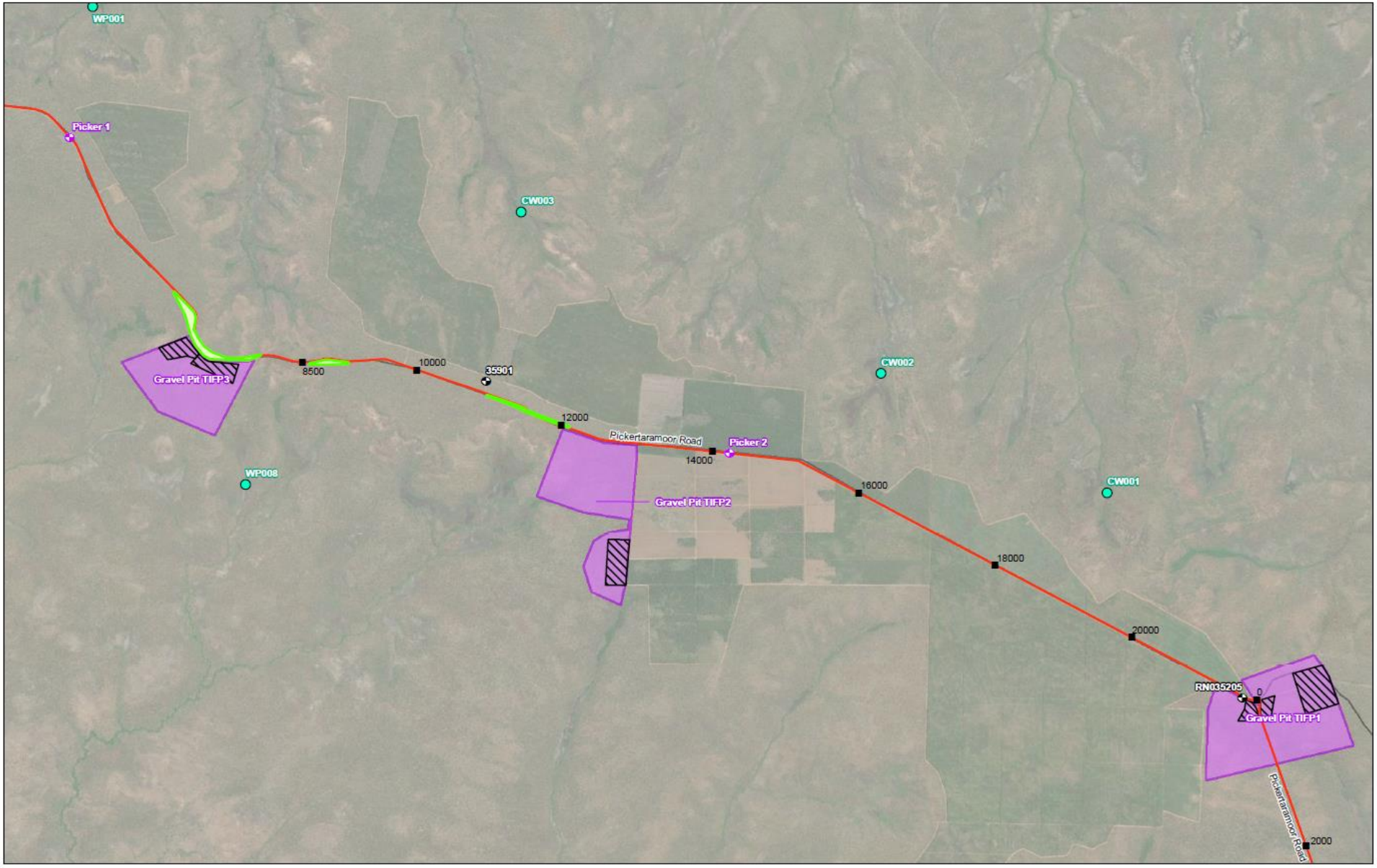
Terrestrial biodiversity surveys for
Melville Island roads

Gravel pit areas and road realignment

Project No. 12543964
Revision No. 0
Date 20/02/2022

FIGURE 5



Legend

- Existing bore
- Proposed bore
- Natural water body
- Road upgrades
- Road realignments
- Proposed gravel pit areas
- Potential gravel pit areas

1:45000 @ A3

0 0.5 1 1.5 2

Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 52

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Terrestrial biodiversity surveys for
Melville Island roads

Gravel pit areas and road realignment

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Revision No. 0
Date 20/02/2022

FIGURE 6

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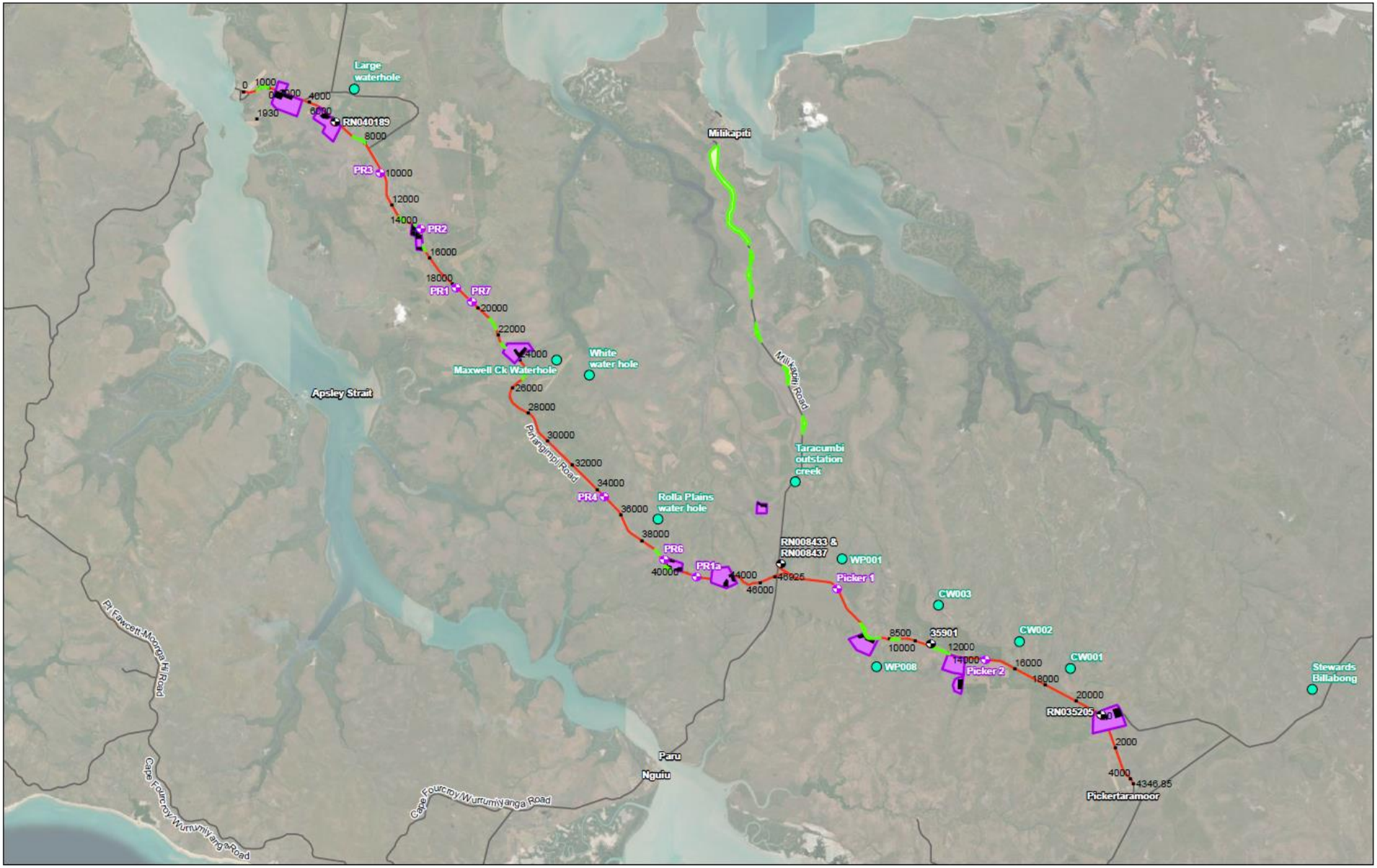
Data source: DIPL - Road upgrades, road realignments (2020); GA - place names, roads (2015); CE - Map areas (2021); Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community. Created by: cmacgregor

2.1.3. Water Extraction

[Add detail if relevant – Where water source is located (include in location map) and extraction methodology]

- Contractors are not required to obtain a water licence when undertaking water extraction associated with road works on public roads. An exemption has been granted pursuant to Section 45 Licence to take or use water (surface water) and Section 60 Grant of licence to take groundwater of the Water Act 1992
- DIPL have written approval from Tiwi Land Council to use the nominated water sources shown in Figure 8 below. [Name of Contractor] will submit land user request forms to TLC to obtain access to the nominated areas when the contract is awarded. Copies of approvals should be provided within this CEMP.
- Bores are yet to be drilled and turkeys nests constructed. Turkeys nests or water tanks will be responsibility of [name of Contractor] to construct.
- Water supply strategy:
    - All water extraction will be undertaken in accordance with the DIPL Standard Specification for Environmental Management and also the NTG Water Resources Branch: Guidelines for Water Extraction as they relate to Road Construction and Maintenance, which is available for download here: Microsoft Word - Factsheets_Guidelines_Roadworks.doc (environment.gov.au)
    - It is known that the nominal required construction water supply per 10 km of double lane sealed road is 3 L/s, and must be located within a feasible water carting distance of no more than 8 km.
    - Bores within 2 km of existing community bore fields run by Power and Water Corporation (PWC) are strictly out of bounds unless special permission is obtained.
    - No bore permits are required to drill a new bore on Melville Island as it is not within a Water Control District.
    - Any access tracks required during works will have gravel laid on the surface to prevent degradation.



Legend

- Existing bore
- Proposed bore
- Natural water body
- Road realignments
- Proposed gravel pit areas
- Potential gravel pit areas
- Road upgrades

1:200,000 @ A3
0 2.5 5 7.5 10
Kilometres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 52

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Melville Island roads

Water sources

Project No. 12543964
Revision No. 0
Date 20/02/2022

FIGURE 8

2.1.4. Camp Site/Laydown/Stockpiling

[Add detail if relevant – where is each located (include in location map)]

Hours of Work – [Add detail] [If the hours of work fall outside of the NT EPA Guidelines .i.e. 7am to 7pm – Monday to Saturday and 9am to 6pm Sunday and Public Holidays, written approval from the DIPL Superintendent is required and a copy attached to this EMP]

- For each road length constructed, a site compound will need to be constructed. This will include a office (transportable buildings), toilets and ablution facilities, vehicle depot and laydown area and other minor infrastructure. This set up will reduce the travel times of construction personnel on local roads.
- It is likely that most plant and equipment will be transported to Melville Island at the start of each dry season for the construction period. Plant and equipment will be stored at the site office and laydown area closest to each section under construction.
- [Name of Contractor] will be responsible for organising and managing the accommodation for the project workforce. Ideally gravel pit areas will be utilised for the camp to reduce the requirement for vegetation clearing and additional disturbance.
- All construction facilities will comply with NT and Commonwealth Acts and regulations, including but not limited to:
    - *Dangerous Goods Act 1998*
    - *Work Health and Safety (National Uniform Legislation) Act 2011* and associated regulations
    - *Waste Management and Pollution Control Act 1998*
    - *Water Act 1992*
    - Code of Practice for the small on-site sewage and sullage treatment systems and the disposal or reuse of sewage effluent (The Code)
    - Code of Practice (CoP) for "Managing the work environment and Facilities". Safe Work Australia – Approved CoP under s274 of the *Work Health and Safety (National Uniform Legislation) Act 2011*
    - Health requirements for mining and construction camps, including registration of kitchens.
- Construction and operation of the site compound will be managed so that it:
    - Does not create a public health nuisance, in particular from dust or other particulate matter
    - Is located within the road reserve or on land with appropriate owner permissions
    - All site laydown is to occur in accordance with the relevant AAPA Certificate, TLC Clearance and TLC entry permit.
    - When closed, a gravel pit rehabilitation program that is governed by the principles detailed within DIPLs standard specification for environmental management (current version) will be used.
- Topsoil from the gravel pits and new road alignments will be stockpiled at the laydown area or gravel pits

2.1.5. Clearing Requirements

[Add detail if relevant – For the actual project works, extraction areas, camp, laydown and turn around areas, etc.]

- Tiwi Rangers are proposed to be utilised in any land clearing operations to confirm approval of clearing area prior to clearing being undertaken.
- Vegetation clearing must comply with the Northern Territory Planning Scheme Land Clearing Guidelines (2021).
- Vegetation clearing must not exceed the areas shown in the maps and plans. This includes those for road upgrades, gravel pit extraction and site compound areas and water extraction sites.
- It is noted that parts of the Project area host vegetation communities considered as 'sensitive' or 'significant' under the Land Clearing Guidelines. Project designs have been developed to avoid these areas. Therefore, clearing outside of these areas requires prior approval from DIPL.
- In all instances of vegetation clearing, large hollow bearing trees will be retained where possible.
- Additional vegetation clearing considerations (not accounted for within DIPL maps and plans) need to be considered immediately prior to clearing with regard to Red Goshawk and Masked Owl nests. [Name of Contractor] will seek results of nest surveys prior to any vegetation clearing.
- The construction works are aimed to be undertaken in the dry season (April to October). For any works outside of this period, [Name of Contractor] is required to develop an Erosion and Sediment Control Plan. This Erosion and Sediment Control plan needs to be prepared by a suitably qualified professional in erosion and sediment control and approved by DIPL prior to implementation on site.

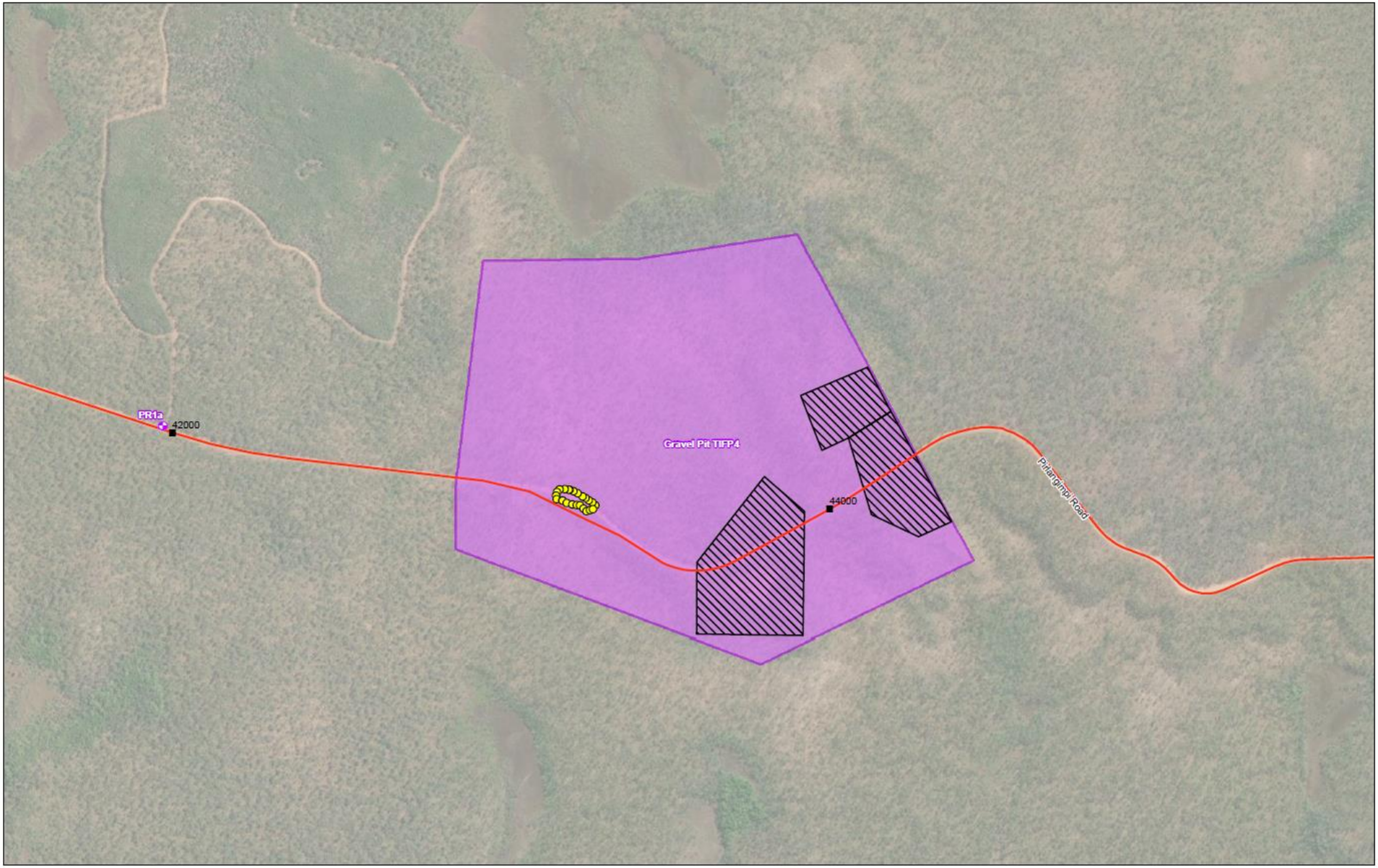
2.2. Location Map/s

[Location map to include detail such as no-go zones, location of site compound/camp, extent of works and clearing, resource pits and water points etc.]

Maps of the project location and components (Figure 1 – 6 & 8) are found in above sections. Maps showing no-go areas are provided below and in the appendices:

- Figure 11: Cultural heritage area near gravel pit 4 on the Pirlangimpi Road
- Appendix B: AAPA certificates for sacred site locations
- Appendix G: Sensitive or significant vegetation and threatened species avoidance areas

[Name of Contractor] will include maps provided in AAPA certificates (C2013/103 and C2016/124) (all construction works including water and mineral extraction along Pickertaramoor and Pirlangimpi roads) and adhere to all conditions specified in terms of avoidance of sacred sites. It is noted that there are no sacred sites in the vicinity of the proposed works areas. [Name of Contractor] will also be aware of a culturally significant site (yellow ochre collection area) in close proximity to the Pirlangimpi road and provide maps for its location and appropriate buffer zones.



Legend

- Munupi Yellow Ochre Track
- Potential gravel pit areas
- Proposed bore
- Road upgrades
- Proposed gravel pit areas

1:10,000 @ A3

0 90 180 270 360

Metres

Map Projection: Universal Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 52

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Melville Island roads

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Cultural Heritage

FIGURE 11

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Print date: 20 Feb 2022 - 14:11

Data source: DIPL - Road upgrades, road realignments (2020); GA - place names, roads (2015); CE - Map areas (2021); Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community. Created by: cmacgregor

3. CEMP Objectives

The objectives of the Contractor's Environmental Management Plan (CEMP) is to ensure that appropriate environmental protection and mitigation measures are implemented to prevent negative impacts on the surrounding environment.

[Provide further, project specific, detail of purpose and scope of CEMP.]

- The CEMP is a hold point in the Contract, therefore no works can commence on site until it is approved for use by DIPL.
- The CEMP is to include all requirements and conditions of applicable environmental approvals and permits, including those stated within the:
    - NT EPA Referral document
    - NT EPA Statement of Reasons / Assessment Report
    - DIPLs standard specification for environmental management (current version)
- DIPL and its Contractors are committed to planning and conducting the Project in accordance with key environment protection and management principals, which include:
    - Much of the disturbance footprint is limited to along the existing roads or cleared areas for existing gravel pits or plantation.
    - A careful and considered approach to managing gravel pit areas to avoid and minimise and reduce potential impacts to erosion of cleared areas on slopes and impacts to surrounding flora and fauna.
    - The progressive rehabilitation of each 1 ha gravel extraction area throughout construction and beyond in order to restore pre-existing vegetation as quickly as possible upon completion of the works

4. Organisation Structure and Responsibility

[Name of Contractor] is required to comply with the provisions of the DIPL Environmental Standard Specification and any other environmental protection provisions in the Contract and observe the requirements of any applicable statute by-law, standard etc. related to environmental protection.

The environmental protection requirements in the DIPL Environmental Standard Specification, together with the Conditions of Contract, are complementary to, and not in substitution for any statutory requirements, or for any of the technical requirements of the specifications and drawings.

[Name of Contractor] must comply with environmental statutory requirements and procedures defined within the Contractor's Environmental Management Plan (CEMP) and supplementary plans.

[The responsibilities for implementing and monitoring the CEMP are as follows:

-

Environmental Site Representative: [Inset name of staff member – as per Section 17.2 of the Environmental Specification, for Tier 4 and 5 contracts, at least one representative on site at all times

when works are being undertaken who has relevant experience and/or a Certificate level Qualification in Environmental Management for construction sites]

5. Legislation, Regulations and Standards

[Delete what is not relevant and add any additional legislation, regulations and standards]

Comply with, but do not be limited to, the following as applicable.

5.1. Northern Territory Legislation

- *Aboriginal Land Act 1978*
- *Bushfires Management Act 2016*
- *Building Act 1993*
- *Dangerous Goods Act 1998*
- *Environmental Assessment Act 1982*
- *Environmental Offences and Penalties Act 1996*
- *Fire and Emergency Act 1996*
- *Food Act 2004*
- *Heritage Act 2011*
- *Northern Territory Aboriginal Sacred Sites Act 1989*
- *Soil Conservation and Land Utilisation Act 1969*
- *Territory Parks and Wildlife Conservation Act 1976*
- *Transportation of Dangerous Goods by Road and Rail (National Uniform Legislation) Act 2010*
- *Waste Management and Pollution Control Act 1998*
- *Water Act 1992*
- *Weeds Management Act 2001*
- *Work Health and Safety (National Uniform Legislation) Act 2011*

5.2. Northern Territory Regulations

- Building Regulations
- Dangerous Goods Regulations
- Environmental Offences and Penalties Regulations
- Fire and Emergency Regulations
- Heritage Regulations
- Territory Parks and Wildlife Conservation By-Laws
- Territory Parks and Wildlife Conservation Regulations
- Transportation of Dangerous Goods by Road and Rail (National Uniform Legislation) Regulations
- Waste Management and Pollution Control (Administration) Regulations
- Water Regulations

- Weeds Management Regulations
- Work Health and Safety (National Uniform Legislation) Regulations

5.3. Federal Legislation

- *Aboriginal and Torres Strait Islander Act 2005*
- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*
- *Aboriginal Land Rights (Northern Territory) Act 1976*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Native Title Act 1993*

5.4. Federal Regulations

- Aboriginal and Torres Strait Islander Heritage Protection Regulations
- Aboriginal Land Rights (Northern Territory) (Land Description) Regulations
- Aboriginal Land Rights (Northern Territory) Regulations
- Environment Protection and Biodiversity Conservation Regulations

5.5. Australian Standards

- AS/NZS/ISO 14001 Environmental management systems - Requirements with guidance for use
- AS 2187.2 Explosives – Storage and use – Use of explosives
- AS 1940 – 2004 The storage and handling of flammable and combustible liquids
- AS1692 – 2006 Steel tanks for flammable and combustible liquids
- AS490-2009 Protection of trees on development sites
- AS 4373 Pruning of Amenity Trees
- AS 2436 Guide to Noise and Vibration Control on Construction, Maintenance and Demolition Sites

5.6. Other Standards

- ASTMD 2487 - Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System)
- ASTMD 7208-6 - Standard Test Method for Determination of Temporary Ditch Check Performance in Protecting Earthen Channels from Stormwater-Induced Erosion
- Code of Practice for Small On-Site Sewage and Sullage Treatment Systems and the Disposal or Reuse of Sewage Effluent November 1996
- The Australian Dangerous Goods Code Edition 7.4

5.7. ANZECC Publications

- Technical Basis for Guidelines to Minimise Annoyance Due to Blasting Overpressure and Ground Vibration

- ANZECC Australian Guidelines for Water Quality Monitoring and Reporting
- ANZECC Guidelines for Fresh and Marine Water Quality

5.8. Other Publications

- International Erosion Control Association (IECA) Australasia Best Practice Erosion and Sediment Control
- Queensland Maroon Book for urban storm water management - Manual for Erosion & Sediment Control, Version 1.2, Sunshine Coast Regional Council
- Blue Book – Managing Urban Stormwater Soils and Construction, Volume 1, 4th edition, Volume 2a – Installation of services, Volume 2b Waste Landfills, Volume 2c Unsealed Roads, Volume 2d Main Road Construction and Volume 2e Mines and Quarries
- Queensland Acid Sulfate Soil Technical Manual, Soil Management Guidelines, Version 4, SE Dear, LE O'Brien, AE McElnea, NG Moore, SK Dobos, KM Watling and CR Ahern
- RTA Code of Practice for Water Management
- Environmental Noise Management Manual
- Soil Survey Standard Test Method, Unified Soil Classification System: Field Method
- Spray drift fact Sheet-APVMA
- Why do fish need to cross the road? - NSW DPI
- QLD standard work method for the assessment of the lawfulness of releases to waters from construction sites
- Australian Rainfall and runoff – Flood analysis and design
- Declared weeds of the Northern Territory
- Weeds of National Significance (WONS)
- DLRM Land Clearing Guidelines NT Planning Scheme 2010
- NT EPA - Noise Guidelines for Development Sites in the Northern Territory
- NT EPA - Keeping our Stormwater clean – a Builder's Guide
- NT EPA – Prevent Pollution from Building Sites
- NT WorkSafe – How to Safely remove asbestos – Code of Practice
- Power and Water Corporation – Disinfection of Subdivisions and Water Service Connections from 20mm and Greater

6. Approvals, Licences and Permits

[List and appendix (i.e. attach to this document) relevant approvals, licences and permits, including (but not limited to):

- access to pastoral, private or Aboriginal owned land
- approval to extract water and/or minerals from Aboriginal, pastoral or private land
- swipe card or Power and Water Corporation (PWC) Meter number for use (if required)
- Aboriginal Areas Protection Authority (AAPA) Certificate that allows for works

  - C2013/103 (Two gravel pit extraction areas)
  - C2016/124 (all construction works including water and mineral extraction along Pickertaramoor and Pirlangimpi roads)
- Aboriginal Land Council approvals (i.e. TLC Clearance Certificate)
- access/Work permit from relevant Land Council (as minimum the application to the Land Council in the interim and permit on receipt)
- Tiwi Land Council (TLC) Mineral Extraction Agreement (MEA) obtained by DIPL
- permits from the entities with jurisdiction over the land to carry out the works, and/or activities associated with the works, on that land (.i.e. Parks and Wildlife, Crown Lands, TLC, etc.)
- approval from Department of Health (DoH) for on-site effluent disposal system and/or certification from a licenced plumber.
- registration with DoH for a camp commercial food preparation area in accordance with the Food Act]
- the Departments Environment Services Branch endorsement of the CEMP and ESCP (when issued)
- Development Permit under the NT Planning Scheme]
- Approvals and correspondence received by DIPL from Tiwi Land Council or TIRC in relation to access to gravel pit extraction and water extraction areas, signed approval of designs, etc.

7. Community Consultation and Complaints Handling

[Name of Contractor] will notify local residents and businesses, including Aboriginal communities, about new or changed construction activities which will affect access to their properties or otherwise **significantly disrupt residents or occupiers use of their premises.**

[Add project specific information; who is responsible for undertaking community consultation? If it is the DIPL Project Manager, state this within the document. If it is the contractor state how community consultation will be undertaken, ie. Letter box drop, local papers, community noticeboard, DIPL website and Facebook, etc.]

Unless the work is of an urgent nature for safety reasons, notification of residents must be at least 5 working days before commencing the work and must advise of the following:

- The nature of the work
- Why it is necessary
- The expected duration
- Changes to arrangements for traffic or property access
- The name and 24 hour contact telephone number of the Contractor's representative who can respond to resident concerns.

Within 1 working day of receiving a complaint about any environmental issue, including pollution, [name of Contractor] will supply a written report to the DIPL Superintendent detailing the complaint and action taken to alleviate the problem. A register of all such complaints will be maintained, together with the following records:

- Date and time of complaint
- The method by which the complaint was made (telephone, letter, meeting, etc.)
- Name, address, contact telephone number of complainant (if no such details were provided, a note to that effect)
- Details of complaint
- Action taken in response including follow up contact with the complainant
- Any monitoring to confirm that the complaint has been satisfactorily resolved
- If no action was taken, the reasons why no action was taken.

8. Non Conformance

[Add detail – include process for identifying, reporting, recording and rectifying non-conformances]

A Failure to comply with, or a breach of, any condition will result in the issue of an Instruction to Contractor, or a Corrective Action Request, or a Non-Conformance Report or any combination of these.

9. Corrective Action Process

[Add details – include management system used and methods for closing out and reporting on the identified non-conformances identified.]

Corrective and preventative actions may be initiated through improvements identified through analysis of non-conformance, opportunities for improvement, industry reform, legislative changes, risks, injuries etc.

[Name of Contractor] shall research the current processes within the organisational operations and provide a corrective action process to be approved by DIPL. Implementation planning, communication and training shall be completed as appropriate.

Corrective action monitoring and records shall be maintained. These may be audited by DIPL from time to time.

Corrective and Preventative Actions forms part of the review and improvement strategies for the project. Preventative and corrective actions will then be updated and incorporated into this CEMP as required.

10. Monitoring

[Add detail - Monitoring is to be tailored to the specific project and may include a daily or weekly site walk over, through to detailed air quality monitoring for dust particles or exhaust fumes from machinery, in stream water quality monitoring, sediment basin water release testing for turbidity, mapping and measuring weed growth, spread and control and the like. Include roles/names of employees responsible for undertaking monitoring]

Aspects with the potential for environmental impact shall be subject to environmental audits as required (risk based approach) and in accordance with the internal procedures of [name of Contractor]. Audits shall be initially conducted by the [name of Contractor] Environmental Officer and then referred to an appropriate environmental practitioner if required. Audit objectives shall be to verify compliance with the CEMP and applicable permits, approvals and regulations.

Environmental monitoring in regards to visual amenity, noise, dust and odour will be undertaken as part of the inspection regime.

It is recommended that daily observations of the [name of Contractor] Environmental Officer be made and reported as necessary to DIPL where the corrective action process outlined in Section 9 will take effect. Risk based monitoring should be conducted, with particular attention to environmental risks assessed as medium and high in the environmental risk assessment (Appendix A), including the following:

- Introduction and establishment of pest species to Melville Island
    - Weed and pest inspections of site, plant and machinery
    - Monitoring to ensure that the controls stated in the Weeds and Pest Management Plan (to be developed by [name of Contractor]) are being upheld and are effective in preventing introduction and establishment of pests
- Monitoring of all works to ensure that all personnel are following the 'unexpected finds' procedure (to be prepared by the Contractor) for unknown indigenous cultural heritage sites are disturbed or damaged during road construction

Records of environmental monitoring are to be maintained, including the effectiveness of any corrective action taken.

Records of environmental monitoring are to be made available to the DIPL Superintendent upon request.

11. Auditing

[Add detail - Develop and implement a risk-based self-auditing program to verify that all works are in compliance with the DIPL Environmental Standard Specification, Legislation and this EMP. Include the proposed timeframe for the audits .i.e. monthly.

The audits are to be based on the key risks identified in the Environmental Risk Assessment as provided in the tender documentation and the risks identified in the CEMP developed by the contractor.]

[Name of Contractor] will maintain records of the results of environmental audits including non-conformances and the effectiveness of any remedial action taken.

Records of environmental audits are to be made available to the DIPL Superintendent upon request.

[Nominate a role/employee to be present during external environmental audits (.i.e. DIPL, NT EPA, DENR)]

12. Environmental Training and Induction

[Add detail – including site specific risks to be addressed in the induction and a copy of the induction checklist]

All site staff, sub-contractors and visitors will be subject to and made aware of the CEMP, environmentally sensitive areas, identified cultural sites of significance, Sacred Sites or Restricted Works Areas (RWAs) and environmental responsibilities.

All site staff, sub-contractors and visitors will be required to undertake a site-specific induction.

All personnel will be required to attend a compulsory induction (which includes environmental responsibilities and requirements under all [if any] permits and licences) before commencing any work at the site. The environmental component of the induction shall include (but not be limited to) the following items:

- All personnel shall be made aware of the Location of significant environmental values including:
  - Listed threatened species and their habitat
  - Sensitive and significant vegetation
- All personnel shall be made aware of the Location of no-go areas and avoidance zones as listed in Section 2.2 of this CEMP template.
- All personnel shall be made aware of the environmental obligations and requirements, including the risk of biosecurity breaches including the introduction and spread of weeds and pests to Melville Island. Policies and procedures around transporting plant and machinery to Melville Island will be covered in the induction.
- All personnel will undertake cultural heritage awareness training, including the procedure to follow for an unexpected find/heritage discovery
- All personnel shall be made aware of their general environmental duty as per the *Waste Management and Pollution Control Act* and the implications of failing to fulfil these duties
- All personnel shall be made aware of their environmental responsibilities under the CEMP in relation to implementing mitigation measures, reporting environmental incidents and complaints and implementing corrective actions.
- All personnel shall be given instructions on environmental emergency response procedures (i.e. spill kit locations and usage).
- A training register and sign off sheets will be maintained and held by the Project Manager and be able to be provided on request.

13. Emergency Management

13.1. Emergency Response

The exists the risk of an emergency situation occurring, such as fire, chemical release, spill, leak, snake bite, equipment failure or any other likely emergency. It is important protocols are in place to control this risk and minimise damage/injury/impact to personnel and environment.

[Name of Contractor} will develop an Emergency Response Plan prior to commencement of works. In the event of an emergency impacting the environment, the Emergency Response Plan shall be adhered to. Contractors will conduct an emergency response drill at a minimum of six (6) monthly intervals. All results of drills or actual events will be recorded and reviewed.

13.1.1. Fire

- Implement a fire management plan, including:
  - Prohibiting activities that involve starting fires such as but not limited to illegal burning of waste, cooking fires in open bushland areas, etc
  - Identify and comply with relevant fire bans.
  - Eliminate and render safe all potential sources of sparks, flame or heat which may generate fire.
  - Appropriate and sufficient firefighting equipment (handheld extinguishers) provided where there is potential to initiate fire. All equipment to be accessible, sign posted and inspected and maintained in accordance with relevant Australian Standards.
  - Ensure there is a nominated person or team trained and designated to respond to small fires if safe to do so.
  - Contractor to establish protocols to ensure early detection and communication of fires to appropriate authorities, including fire awareness training for staff and sub-contractors in high fire risk areas.

[add detail]

13.1.2. Weather i.e., Cyclone

[add detail]

13.1.3. Spills/Contamination

- Appropriate type and quantity of spill response material shall be maintained on-site at all times in order to respond to a major fuel or chemical spill.
- Prepare and implement spill response and containment procedure for in the event of spillage of hazardous waste substances, including the immediate cessation of works, containment, clean-up and disposal to a licenced trade waste site. This includes for spills from machinery working in the site.
- Treat any soil contaminated by the spill to EPA specifications or remove to an approved trade waste site within one (1) day of the spill.
- Conduct soil testing if any potential soil contamination is identified. Install run-off control measures.
- Monitor for indicators of Acid Sulfate Soils and Abestos Containing Materials, particularly during soil disturbing activities

- Install runoff control measures where contamination is possible from dust suppressant water.

13.1.4. [any additional emergency items relevant to the job]

[add detail]

13.1.5. [Reporting requirements to relevant agencies (i.e. Emergency Services, NT EPA, Bushfires NT, Worksafe)]

[add detail]

13.2. Responsible Persons and Emergency Contacts

Contact	Position	Phone number
NT EPA – Pollution Hotline	Environmental Regulator	1800 064 567
	[Project Manager]	
	[DIPL Contact]	
	[Local Police/Emergency Services]	

13.3. Emergency Plan Camp / Work Site

[Add site diagram for camp / work showing building layout (if known), emergency muster points, storage areas for dangerous goods and chemicals, egress, spill kits, hydrants, first aid locations, etc.]

14. Risk Assessment

14.1. Job Specific Risk

14.1.1. [Specific risk detailed in Environmental Risk Assessment or Notice of Intent or determined by Contractor]

Contractor is to include a copy of the environmental risk assessment conducted for the NT EPA referral (GHD, 2022)

14.2. Management of Identified Risk

14.2.1. Mineral Extraction

Management Strategy	(Details site specific Management Strategy)
Control(s)	• [Delete all unnecessary management/control items] • Nominated extraction pits are covered under AAPA CXXXX/XXX and permission to access the pits has been granted by XXXX (approval attached as Appendix C) • Creation or use of existing extraction areas for fill or gravel within the road reserve not supplied/nominated by DIPL require the written approval from the DIPL Superintendent before use. • DIPL's standard requirements for the operation of extraction areas are as follows: <u>Access</u> - Construct only one access road to each pit. Additional access roads require written approval from the Superintendent prior to construction, - Confine all transport operations to the access road, the extraction area, the site of the works and/or existing public roads, - Provide and maintain adequate road drainage to the access road. <u>Limit of excavation</u> - Not within 6m of any fence line or utility service line or point, - Not within any gas pipeline easement, - Not within 125m of any road or railway centre line, - Not within 25m of a water course (refer to Northern Territory Land Clearing Guidelines 2019 for water course buffers), - Not within 200m of a defined waterway crossing, - Not within vegetative buffers, - Pit should be 1ha maximum. - **Hold Point** – Obtain Superintendent approval to exceed 1ha pit size. <u>Extraction</u> - Stockpile cleared vegetation for use in pit rehabilitation, - Strip 100mm depth top layer throughout the extraction area of operation and stockpile,

Management Strategy	(Details site specific Management Strategy)
	- Stockpiled material to be clear of drainage lines, and other vegetated areas, to a maximum height of 2m, - Side slopes of sand or gravel to be no steeper than one vertical to two horizontal at any time when the excavation is unattended, alternatively benching of vertical batters is acceptable, - Remove or bury by-products of the excavation operation unless otherwise specified, - Progressively rehabilitate extraction areas i.e. rehabilitate one pit before moving to the next. • No deviation from the above requirements will be permitted without written approval from the DIPL Superintendent to proceed. • [The Department will require a Pit Management Plan be developed for large or high-risk projects. The Pit Management Plan is to provide detail as to how [name of Contractor] plans to clear, work and rehabilitate pits during the life of the project. The Pit Management Plan is to include, as a minimum, diagrams showing the pits to be used, location of stockpile sites, drainage lines and location and type of erosion and sediment controls, and details regarding pit staging and rehabilitation] • Rehabilitation of gravel extraction areas is to be undertaken as per Rehabilitation of Extraction Areas, Detours and Access Tracks outlined in the Environmental Management Standard Specifications. • [Add any additional items specific to the job] • The Gravel Pit Management Plan is to be developed by [name of Contractor] and appended to this CEMP using the relevant considerations provided within this CEMP framework, including: - Detail how [name of Contractor] plans to clear, work and rehabilitate pits during the life of the project. - Diagrams showing the pits to be used, location of stockpile sites, drainage lines and location and type of erosion and sediment controls, - Details regarding pit staging and rehabilitation. - During construction, gravel pit plans will be submitted to Tiwi Land Council for review and approval with works ongoing during the dry season with preparation for erosion and sediment control should works extend into the wet season. This will involve, only 1 ha cleared and rehabilitated at a time within each gravel pit location. - Gravel extraction will only occur from approximately 23 locations within the proposed gravel pit areas (total of approximately 23 ha) - Preference 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

Management Strategy	(Details site specific Management Strategy)
	- DIPL and its Contractors are committed to the progressive rehabilitation of each 1 ha gravel extraction area throughout the construction phase of the Project and beyond. This program is one of the key environment protection and management principals, developed with the existing environmental conditions and associated key risks of the Project in mind. • Gravel pit disturbance area is not to enter the biodiversity avoidance areas shown in Appendix G
Performance Indicator(s)	[Add detail] [e.g. extraction activities remain restricted to areas approved under AAPA/MEA/land owner. No complaints received from AAPA/Land Council/Land owner Extraction pits remain at the approved size, no over clearing occurs. No clearing occurs within the buffered 'no-go' zones around waterways. Rehabilitation activities have completed prior to the on-set of the Wet Season.]
Monitoring	[Add detail] [e.g. pit management monitored daily by plant operators during extractive activities. Pit management audited weekly by site supervisor/HSE officer. Progressive rehabilitation activities monitored on a weekly basis by HSE officer.]
Reporting	[Add detail] [e.g. plant operators to report all non-conformances to site supervisor. Project Manager/HSE Officer to provide monitoring reports to DIPL (frequency to be pre-approved by DIPL and [name of Contractor] prior to commencing works. Provide monthly progress report on rehabilitation to DIPL.]
Corrective Action(s)	[Add detail] [e.g. In instances of over clearing, immediately rehabilitate over cleared area. Provide a report, with photos, to DIPL Superintendent. Re-establish/re-flag clearing limits on site. Undertake tool box meeting to discuss clearing limits.] Corrective action shall be implemented to meet required outcomes of this CEMP (where required), this may include: - Hold point on mineral extraction until all relevant personnel can be re-briefed on proper mineral extraction management procedures

14.2.2. Water Extraction

Management Strategy	(Detail site specific Management Strategy)
Control(s)	[Delete all unnecessary management/control items]

Management Strategy	(Detail site specific Management Strategy)
	• Nominated water points are covered under AAPA CXXXXXX and permission to access the points has been granted by XXXX (approval attached as Appendix C) • NTG Road Bores are to be utilised where possible, and where not practical, private/pastoral bores may be nominated. Any approval to access private or leasehold land to extract water from a bore is the responsibility of the awarded contractor. • Notify the DIPL Superintendent of the location, expected water use and how it will be extracted for each and every proposed occasion. This must be done prior to extracting any water. The DIPL Superintendent will review the information prior to providing approval. Do not extract water until approval is granted. • For all water bodies, ensure that any water extraction will not reduce the supply utilised by local landholders and the environment, to the point where such users are adversely affected. For all water bodies, ensure that any water extraction will not reduce the supply to the natural environment to the point where the natural environment is adversely affected. The general guideline is that only 20% of any flow in a river or 20% of any standing water body should be used in the Top End and 5% for Southern Regions. Generally, construction of sumps or dams is not permitted. • Where a standing water body is less than 500mm deep or extraction from the water body (river or waterhole) is likely to exceed 20% as detailed above, source an alternative water supply. • Protect the banks and beds of any waterhole or river used for water extraction. Any damage is to be repaired immediately. Pads and tracks likely to contribute to erosion must be rehabilitated. • No fuels, lubricants or equipment, other than pumping equipment are permitted to enter or remain at the water body. • Non-permeable bunding in accordance with Australian Standard (AS 1940 – 2004) is to be provided around pump/generator equipment. • Those stated in section 2.1.3 of this document • 'Contractors will adhere to Section 23.4 and Section 24.2 of the DIPL Standard Specification for Environmental Management, current version. • Assessment of each natural water body source point will be assessed for suitability of access. • Vehicles will use new and existing tracks only. Driving through waterways with unmarked tracks or tracks without construction controls will not be permitted. • New and existing tracks will be gravel laid prior to use by water trucks to prevent erosion. • Tracks and turnarounds will be set well back from waterholes and creeks to protect bank integrity and keep sensitive riparian vegetation undisturbed. • Water extraction should be limited or concentrated towards the early part of the dry season when water demand will be less and water supply is greater.

Management Strategy	(Detail site specific Management Strategy)
	• No dams or bunds on a natural watercourse will be constructed. • Where a standing water body is <500 mm deep or extraction from a water body is likely to exceed 20%, an alternative water source will be sought. • Any water to be extracted from groundwater bores (new and existing) or surface water bodies requires the explicit permission of the necessary stakeholders including Tiwi Land Council, DEPWS and relevant sacred sites authorities, among others. • Gravel pit disturbance area is not to enter the biodiversity avoidance areas shown in Appendix G • [Add any additional items specific to the job]
Performance Indicator(s)	• No complaints received from AAPA/Land Council/Land owner • No erosion or sedimentation caused by access to water extraction points. • No disturbance to riparian vegetation, sensitive or significant vegetation, listed threatened species in or surrounding the water extraction points. • No water extracted from waterbodies with <500 mm water • No measurable impact on surface water and groundwater quality or aquatic ecosystems within the water extraction areas (natural water bodies and bores) or downstream of works areas
Monitoring	Water extraction points audited weekly by site supervisor/environmental officer for each of the performance indicators.
Reporting	Project Manager/HSE Officer to provide monitoring reports to DIPL (frequency to be pre-approved by DIPL and [name of Contractor] prior to commencing works. Provide monthly progress report to DIPL.
Corrective Action(s)	In instances of over clearing, immediately rehabilitate over cleared area. Provide a report, with photos, to DIPL Superintendent. Corrective action shall be implemented to meet required outcomes of this CEMP (where required), this may include: - Hold point on water extraction until all relevant personnel can be re-briefed on proper water extraction management procedures - Rehabilitation of disturbed areas

14.2.3. Cultural and Heritage Management

Management Strategy	(Detail site specific Management Strategy)
Control(s)	[Delete all unnecessary management/control items] • [Reference, and attach to the CEMP as an appendix, all relevant AAPA Certificates, Land Council clearances and Heritage Branch approvals] • [Name of Contractor] will make all personnel aware of a culturally significant site (yellow ochre collection area) in close proximity to the Pirlangimpi Road and provide maps for its location and avoidance zones.

Management Strategy	(Detail site specific Management Strategy)
	• AAPA certificate(s) C2013/103 and C2016/124 provide the Department and its Contractor, including sub-contractors, with indemnity from prosecution under the NTASS Act as long as the following are adhered to: - All works are confined to the 'subject land' identified on the certificate - All activities conducted by [name of Contractor] are covered in the 'Purpose of Use' on the certificate - All conditions on the certificate are adhered to - All contractors, employees and sub-contractors are aware of the conditions of the certificate. • **Hold Point** - Should any item be encountered which is suspected to be a relic of heritage value or any relic, artefact or material which might be of Aboriginal or Torres Strait Islander origin, all construction work that might affect the item will cease and the item protected from damage and disturbance by the Contractor. The Superintendent will be notified immediately, who will then arrange for appropriate specialists and community representatives to inspect the site. • No further works in the vicinity are to recommence until the DIPL Superintendent has provided further advice to do so. There may be a requirement for the Heritage Branch (Department of Tourism and Culture), Land Council or AAPA to investigate the findings. • All personnel working on site will receive training regarding their responsibilities related to cultural heritage and will be made aware of any sites or areas which must be avoided. • Sites or areas which must be avoided or protected during works must be identified on a site map. The map must be made available to all relevant personnel during the works. • The protection of sites may require the installation of temporary protection fencing and maintenance of the fencing. • Tiwi Rangers are proposed to be utilised in any land clearing operations to confirm approval of clearing area prior to clearing being undertaken. • [Add any additional items specific to the job]
Performance Indicator(s)	• No complaints received from AAPA/Land Council/Land owner • No disturbance to known or unknown cultural heritage values or sacred sites as part of the works.
Monitoring	Known cultural heritage values and sacred sites visited weekly by site supervisor/environmental officer and inspected for signs of disturbance.
Reporting	Project Manager/HSE Officer to provide monitoring reports to DIPL (frequency to be pre-approved by DIPL and [name of Contractor] prior to commencing works. Provide monthly progress report to DIPL.
Corrective Action(s)	Corrective action shall be implemented to meet required outcomes of this CEMP (where required), this may include:

Management Strategy	(Detail site specific Management Strategy)
	- Hold point on all works until all relevant personnel can be re-briefed on proper management procedures - TLC to be notified of any disturbance and further corrective actions to be agreed upon by all stakeholders.

14.2.4. Site Control / Clearing / Stockpiling

Management Strategy	(Detail site specific Management Strategy)
Control(s)	[Delete all unnecessary management/control items] • **[Hold Point** - Provide a copy/copies of permit(s) to clear native vegetation, for the execution of the works, from the permit authority under the *Planning Act* and/or the *Pastoral Land Act*, before commencing works.] • **[Hold Point** - Provide a copy/copies of written permission to clear native vegetation from the owner(s) or lessee(s) of the land, proposed to be cleared for the execution of the works, before commencing works.] • [**Witness Point** - Obtain written approval from the Superintendent for the establishment and use of any detours, turnarounds or equipment lay down areas. Use existing cleared areas where possible.] • Do not form any new tracks, alter any existing tracks, erect any camps, remove any trees or shrubs, cut any fences or water, sewer, power or telecommunications lines or perform other activities not specified or indicated on the drawings or otherwise required under the Contract without the prior written approval of the DIPL Superintendent. • All works are to be staged appropriately to minimise potential risks and impacts to the environment. Staging of the works must be addressed in the project timeline. • All works within waterways/drainage lines will be completed and the site stabilised prior to the start of the Wet Season (by 30 September). • Install all necessary erosion and sediment control measures to effectively manage sediment laden runoff or wind erosion from stockpile areas. • Do not place stockpiled materials inside vegetation protection areas or within 10 metres of retained trees or within the drip line of any trees. • Do not place stockpiles within 50 metres of any drains, drainage lines, creeks or other waterways. • Locate the stockpiles so that any slump of the stockpile would not affect erosion and sediment control measures or infringe upon specified minimum clearance requirements. • Topsoil stockpiles are not to be more than 2 metres in height. All other stockpiles are not to be more than 3 metres in height (unless approved by the Superintendent). • Topsoil that is not contaminated by noxious weeds must be stockpiled for later spreading on batters and other disturbed areas. Other material may also be stockpiled but separated from the topsoil stockpiles.

Management Strategy	(Detail site specific Management Strategy)
	• Stockpiles in residential areas or adjacent to sensitive receivers are not to exceed 2 metres in height. • Maintain the stockpiles to prevent the growth of weeds on the stockpiles. • Long term stockpiling in the urban environment is to include protection to reduce the risk of wind (dust) and/or rain (sedimentation). • Mulch stockpiles are to be monitored for tannin leachate. In the event leachate is identified, controls will be installed to prevent run-off from site/into waterways. • Those specified in section 2.1 of this document • [Add any additional items specific to the job]
Performance Indicator(s)	• No complaints received from AAPA/Land Council/Land owner • No erosion or sedimentation caused by construction works. • No disturbance to riparian vegetation, sensitive or significant vegetation, listed threatened species in or surrounding the construction works. • No stockpile management or vegetation clearing works conducted in a way that breaches the management strategies listed above • No incidents of stockpile containment failure including unacceptable levels of sediment released into the drainage lines. • No complaints are received in relation to stockpile issues.
Monitoring	Gravel pits and active roadworks sites audited weekly by site supervisor/environmental officer for each of the performance indicators. Undertake visual assessment and/or monitoring, with particular attention to stockpile positioning, height, containment, and detection of odours.
Reporting	Project Manager/HSE Officer to provide monitoring reports to DIPL (frequency to be pre-approved by DIPL and [name of Contractor] prior to commencing works. Provide monthly progress report on rehabilitation to DIPL.
Corrective Action(s)	In instances of over clearing, immediately rehabilitate over cleared area. Provide a report, with photos, to DIPL Superintendent. Corrective action shall be implemented to meet required outcomes of this CEMP (where required), this may include: - Hold point on works until all relevant personnel can be re-briefed on proper stockpile and vegetation clearing management procedures

14.2.5. Erosion and Sediment Control

Management Strategy	(Detail site specific Management Strategy)
Control(s)	• [Prepare and submit a site specific and project specific Erosion and Sediment Control Plan (ESCP) when required as per Section 6 of the Standard Specification for Environmental Management.]

Management Strategy	(Detail site specific Management Strategy)
	• Temporary erosion and sediment control measures will be kept on site at all time. • It is the responsibility of (project role) to monitor local weather and determine the requirement to install temporary controls on site. • Temporary controls to be utilised on site include: [list controls i.e. sediment fence, rock check dam etc. include as an appendix standard drawings for each control] • Erosion and sediment control measures will not be removed until disturbed areas have been stabilised. • Disturbed areas will be stabilised progressively with vegetation during construction, where necessary, and stabilisation will be undertaken after works are complete and prior to demobilization from site. • All controls specified within section 2.1.1 of this document • 'Contractors will adhere to Section 6 of the DIPL Standard Specification for Environmental Management (current version) • Contractors will adhere to Section 3 of the Standard Specification for Roadworks (current version) • The construction works are aimed to be undertaken in the dry season (April to October). For any works outside of this period, [name of Contractor] is required to develop an approved Erosion and Sediment Control Plan by a suitably qualified professional in erosion and sediment control and implement on site. • Preference 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 • Each section of road constructed each year will be sealed to protect the pavement, provide a safe driving surface and prevent erosion. That is, it will not be left incomplete prior to wet season and contractors demobilising from the site. • The sections of the roads that are 'relocated' will be scarified and rehabilitated to prevent access and encourage vegetation growth. Topsoil from the new alignments will be stockpiled at the laydown area or pits and be utilised in spreading across the decommissioned sections of road to increase the potential for native species seed bank germination and recruitment. • The gravel extraction area "floor" is to be ripped using dozer or grader tyres to a depth of 100 mm to 200 mm to loosen the floor to encourage new plants to establish. Ripping is to be carried out along contour lines to reduce erosion. • Erosion and sediment control measures comply with the following requirements: a.) Early installation of all drainage erosion and sediment control measures. b.) Control measures will be in place prior to the commencement of works c.) All erosion and sediment control measures are to be installed and maintained in good working order. d.) Any runoff from the site will comply with the requirements of the DEPWS Guidelines and relevant legislation.

Management Strategy	(Detail site specific Management Strategy)
	e.) Contractor daily site inspections will consist of visual assessment of erosion and sediment control structures to verify their condition and effectiveness. Records of inspections will be kept and made available upon request. f.) Control measure will be inspected throughout the duration of works and particularly following each rain event. g.) Control measures will be rearranged and repositioned as required to maintain their efficiency. h.) Sediment collected by control measures will be handled and disposed of in a manner approved by the Superintendent. i.) All temporary control measures will be removed following rehabilitation or when otherwise no longer required. • (Add any additional items specific to the job)
Performance Indicator(s)	• No complaints received from AAPA/Land Council/Land owner • No complaints are received in relation to erosion and sediment control issues. • No erosion or sedimentation caused by construction works. • To minimise impacts of any sediment runoff into adjacent wetlands, floodplains and bushland outside the works areas • To minimise leachate generation as much as practicable • All works are managed in accordance with the International Erosion Control Association Best Practice Erosion & Sediment Control Guidelines, the NT Waste Management & Pollution Control Act 2016 and the Australian Government National Water Quality Management Strategy (NWQMS).
Monitoring	All gravel pit extraction areas and major works areas to be visually inspected daily by site supervisor/environmental officer for each of the performance indicators. Undertake ongoing visual inspections for assessment of water quality including turbidity exiting the facility, downstream of sediment traps.
Reporting	Project Manager/HSE Officer to provide monitoring reports to DIPL (frequency to be pre-approved by DIPL and [name of Contractor] prior to commencing works. Provide monthly progress report to DIPL.
Corrective Action(s)	In instances of over clearing, immediately rehabilitate over cleared area. Provide a report, with photos, to DIPL Superintendent. Corrective action shall be implemented to meet required outcomes of this CEMP (where required), this may include: - Hold point on water extraction until all relevant personnel can be re-briefed on proper water extraction management procedures Rehabilitation of disturbed areas

14.2.6. Weed Management

Management Strategy	(Detail site specific Management Strategy)
Control(s)	Delete all unnecessary management/control items] • [For all projects, Contractors must: - Survey for declared weeds and assess risk of spread - Consult with Local Council and Department of Environment, Parks and Water Security (DEPWS) Weed Management Branch about management procedures to be implemented by [name of Contractor] - Eliminate the seed source where possible - Establish weed protocols to prevent spread of weeds and their seeds offsite if handling of weed contaminated materials is unavoidable and - Practice on-going weed hygiene.] • [If declared weeds or Weeds of National Significance (WONS) are known to be present or have potential to be established and/or spread on site, a Weed Management Plan (WMP) is required: - Prioritise declared weed species and locations for control based on previous mapping and any site survey (if available) - Detail chemical type, rates, method of application and process to collect data for priority species - Address seasonal restrictions to access and weed reproductive cycles to prevent weed seeding - Integrate chemical control with slashing and burning requirements - Incorporate monitoring so control effectiveness and spread prevention can be evaluated - Enforce weed hygiene protocols. Ensure that vehicles and plant are steam cleaned or high pressure water cleaned removing all earth/soil/seeds to prevent the spread of weeds and pest animals entering the works site.] • [**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.] • **[Witness Point** - Provide evidence that the area is weed free or provide advice of the weeds present in the areas of the works.] • **[Witness Point** - Provide evidence that the vehicles and plant brought on to the site of the works are free of weeds and their seeds and are soil free.] • **[Witness Point** - Provide evidence that organic matter transported to site is free of weeds and/or their seeds.] • **[Witness Point:** Provide the Superintendent with a signed statement certifying that cleaning took place.] • The reuse of weed contaminated topsoil by surface spreading is not permitted. • Topsoil that is contaminated with weed seeds will be quarantined with visible barriers and a notice, then treated appropriately. Alternatively, it will be buried under 300mm depth of clean, weed seed free fill.

Management Strategy	(Detail site specific Management Strategy)
	• The main methods to ensure that weeds are not spread are: - Clean machines before moving between sites - Don't use or move materials contaminated with weed seeds - Avoid travelling through weeds that are seeding. • Collection and disposal of the removed earth and organic material will be conducted in a method that will ensure that it does not infest any river, stream, wetland or property. • During the construction works, [name of Contractor] is required to implement an approved Weed and Pest Management Plan in line with NTG Standard Specification for Environmental Management which states the following: - Provide a copy of a site specific and project specific Weed Management Plan (WMP) in accordance with Australian Government and Northern Territory Government guidelines. A WMP is required if Declared Weeds or Weeds of National Significance (WoNS) are known to be present or have potential to be established and/or spread on site. - Land managers, including the Department and its Contractors, are legally responsible for the prevention of spread and control of Declared Weeds in accordance with the Weeds Management Act regardless of the size of project. • For all projects, Contractors must: - Survey for declared weeds and assess risk of spread, - Consult with Tiwi Land Council and the Department of Environment, Parks and Water Security (DEPWS) Weed Management Branch about management procedures to be implemented by [name of Contractor] - Eliminate the seed source where possible - Establish weed control protocols to prevent spread of weeds and their seeds - Practise on-going weed hygiene. - If DECLARED WEEDS (plants identified by DENR requiring control, eradication or prevention), and/or ALERT WEEDS (to be immediately reported to DEPWS), and/or Weeds of National Significance (WoNS), are identified on site, a detailed WMP is to be submitted with the CEMP." • Before entering the Tiwi Islands, all vehicles, plant and machinery will be steam or high-pressure water cleaned to remove all earth/soil to prevent the spread of weeds and pest animals. • Vehicles, plant and machinery will complete a weed hygiene declaration and undergo biosecurity checks prior to entering the Tiwi Islands • A Weeds and Pest Management Plan will be developed by [name of Contractor] as part of the CEMP and implemented during construction and decommissioning. This management plan will include the above mitigations in addition to the following:

Management Strategy	(Detail site specific Management Strategy)
	○ Regular and ongoing visual inspections (most importantly following soil disturbance and following rainfall) of the Project area and surrounds to identify, contain, and eradicate the emergence of weeds, as per NT Government Weed Management Handbook (DEPWS, 2018) • [Add any additional items specific to the job]
Performance Indicator(s)	• No complaints received from AAPA/Land Council/Land owner • No introduction, establishment or spread of weed or pest species • Objectives of WMP are achieved
Monitoring	• Undertake monitoring for the following: ○ Evidence of revegetation of native, species known to the area ○ No introduction, establishment or spread of weed or pest species • Regular and ongoing visual inspections (most importantly following soil disturbance and following rainfall) of the Project area and surrounds to identify, contain, and eradicate the emergence of weeds, as per NT Government Weed Management Handbook (DEPWS, 2018)
Reporting	• Project Manager/HSE Officer to provide monitoring reports to DIPL (frequency to be pre-approved by DIPL and [name of Contractor] prior to commencing works. • Vehicles, plant and machinery will complete a weed hygiene declaration and undergo biosecurity checks prior to entering the Tiwi Islands
Corrective Action(s)	• Where monitoring and ongoing visual inspection detects the introduction or spread of weeds, immediate control measures will be conducted include physical and chemical treatments appropriate for the weed species present. Seek advice from Weeds Branch of NT EPA if required for weed identification or control advice • In instances of over clearing, immediately rehabilitate over cleared area. Provide a report, with photos, to DIPL Superintendent. • If objectives or WMP or performance indicators are not met, [name of Contractor] to consult with DIPL to formulate appropriate corrective action. • Where investigations show restricted/declared weeds, and pests present, revision to management plans shall be undertaken and further controls implemented, as necessary. Controls may include use of contracted licensed weed eradicator or pest exterminator.

14.2.7. Water Quality

Management Strategy	(Detail site specific Management Strategy)
Control(s)	[Delete all unnecessary management/control items]

Management Strategy	(Detail site specific Management Strategy)
	• Comply with all relevant legislative requirements and requirements of local water authorities and all other relevant laws and by-laws in force in the Northern Territory. • Provide controls, including soil erosion and sediment controls, to ensure that all water leaving the site complies with any water quality criteria. (This includes streams/waterways, bores, hydrants and stand pipes). • Water quality of the downstream environment is to remain as close as possible in quality as those upstream environments above the designated works area. • In the urban environment measures are to be implemented to prevent contaminated water leaving the worksite and entering stormwater infrastructure. • Water quality monitoring is to follow basic scientific methodology and base line measures are to be undertaken prior to commencement of work. During construction monitoring is to occur at the same location upstream and downstream at approximately 100m away from either side of the boundary of the works area and at the same time weekly to ensure consistency • The water testing is to include the upstream and downstream flow rates, turbidity and pH levels. • The weekly reporting is to include: - The date and time the monitoring was undertaken at each location - The details of the person undertaking the monitoring (name, title and contact phone number) - The GPS location of the sampling site - The flow rate in m^3/s - The quantity of water extracted from the waterway during the previous week (if any) - The turbidity in Nephelometric Turbidity Units (NTUs) - The pH level. • The natural channel geometry and meander form of perennial and non-perennial streams must not be altered, nor riparian vegetation disturbed except where written approval is given by the DIPL Superintendent. • Temporary hydraulic structures such as open channels, drainage lines, batter chutes, release points into streams, and vehicle crossings, are to be designed to carry flows and remain stable, without causing erosion damage, in at least the 5-year Average Recurrence Interval (ARI) event of critical duration. • Flow in channels and drainage lines must be managed to non-erosive velocities, or channels lined with suitable protective material as necessary to prevent scouring. • Works in waterways and stormwater drainage lines are to be timed to minimise the potential for exposure to rain or flood events, have minimal disruption with disturbed areas and be rehabilitated within 10 days following completion of works in these areas. • Table drains are to be top-dressed with stripped topsoil from the project to promote the re-establishment of grasses along batters. Where

Management Strategy	(Detail site specific Management Strategy)
	specified in the project RFT/RFQ the batters are to be hydro-mulched with native or exotic species as listed in the document. • Conduct all dewatering activities in a manner that does not pollute the environment. • Water quality is to be adequately and continuously protected through all phases of development/construction of the project. Water discharged from the site is to be of a standard to ensure no detrimental impacts on water quality and the environment occur during the construction phase. An increase in suspended solids within surface waters discharged from a work site is not to exceed a 10% increase from upstream to downstream of the site. • (Add any additional items specific to the job)
Performance Indicator(s)	• No complaints received from AAPA/Land Council/Land owner • No sedimentation or spread of contaminants caused by access to water extraction points or water extraction process • No visible change to water quality following the extraction of water • No measurable impact on surface water and groundwater quality, or aquatic ecosystems within the water extraction areas (natural water bodies and bores) or downstream of works areas
Monitoring	Water extraction points audited weekly (and by regular and ongoing visual inspection) by [name of Contractor] site supervisor/environmental officer for each of the performance indicators.
Reporting	Project Manager/HSE Officer to provide monitoring reports to DIPL (frequency to be pre-approved by DIPL and [name of Contractor] prior to commencing works.
Corrective Action(s)	Corrective action shall be implemented to meet required outcomes of this CEMP (where required), this may include: - Hold point on water extraction until all relevant personnel can be re-briefed on proper water extraction management procedures - Rehabilitation of disturbed areas

14.2.8. Vegetation Management

Management Strategy	(Detail site specific Management Strategy)
Control(s)	[Delete all unnecessary management/control items] • Do not destroy, remove or clear vegetation to an extent greater than is necessary for the execution of works and/or identified in the design drawings. • Identify environmentally sensitive areas within or that maybe impacted on by the project works. EG. Riparian vegetation, swamps or wetlands, escarpments, gorges and Sites of Conservation Significance, etc • Minimise environmental risks by following vegetation management strategies such as: - Excluding access to significant vegetation areas

Management Strategy	(Detail site specific Management Strategy)
	- Excluding sacred sites/trees - Selecting appropriately sized clearing machinery and equipment - Minimising worksite area - Protecting vegetation driplines - Locating ancillary activities (e.g. stockpile sites, camps, parking locations, vehicle hardstands) within existing disturbed areas. • Where trees are to remain on site within the construction zone, AS4970-2009 Protection of Trees on Development Sites is to be applied. • Should a threatened species be identified onsite, stop works in the immediate area, notify the DIPL Superintendent, and install a temporary protective barrier to protect the species. • Prior to clearing any area it is to be demarcated with fencing, flagging tape, spray paint or other method approved by the DIPL Superintendent. • Ensure the demolition indicators (tapes, spray paint or other) do not go outside of the clearing limits shown on the drawings OR the clearing limits approved in writing by the DIPL Superintendent. Ensure that all site personnel observe the limits of clearing and are made aware of the importance of any vegetation of significant value. • Should works or disturbance be proposed in areas outside the previously approved works boundaries, permission must be obtained in writing from the DIPL Superintendent. • If any areas of vegetation within the limits of clearing are to be retained, fence off with temporary fencing. • Clearing will be staged so that land disturbance is confined to minimum areas of manageable size, thereby limiting the extent and duration of exposure. Control measures will be applied progressively as each stage is cleared. • All areas to be cleared or used as turnaround or laydown areas will be identified on clearing plans, approved by the Superintendent, provided to the personnel undertaking the clearing works, and flagged on the ground prior to any clearing activities commencing. • Methods and timing of clearing is to be implemented in a manner that minimises the potential for erosion to occur. All machinery operators will be trained in best practises for clearing to minimise erosion. • Cleared vegetation, excluding weeds, may be stockpiled and reused on site for rehabilitation of disturbed areas such as, extraction areas, vehicle turn around areas, detours etc. • Cleared vegetation can also be mulched on site and re-used on site where appropriate as ground cover or environmental control measures, if suitable. • Storage of cleared vegetation and stripped topsoil is not to impact on areas outside of that required for project works. • Clearing of native vegetation, particularly within extraction areas is to adhere to the buffer requirements to waterways referenced in the NT Land Clearing Guidelines 2019.

Management Strategy	(Detail site specific Management Strategy)
	• Any variation to the buffers distances outlined in the NT Land Clearing Guidelines will require prior written approval from the DIPL Superintendent. • There are numerous listed threatened flora and fauna species (and their habitat) within the works areas. These values have been mapped and avoidance areas have been applied. Vegetation clearing is not to occur within the biodiversity avoidance areas shown in Appendix G or the cultural heritage and sacred sites shown in Figure 11 and Appendix B • [Add any additional items specific to the job]
Performance Indicator(s)	• No complaints received from AAPA/Land Council/Land owner • Vegetation clearing does not to occur within the biodiversity avoidance areas shown in Appendix G or the cultural heritage and sacred sites shown in Figure 11 and Appendix B
Monitoring	• Undertake monitoring (regular and ongoing visual inspection) for the following: ○ No clearing within biodiversity avoidance areas ○ No disturbance to riparian vegetation, sensitive or significant vegetation within or surrounding the water extraction points. ○ No introduction or spread of weed species within or surrounding works areas
Reporting	Project Manager/HSE Officer to provide monitoring reports to DIPL (frequency to be pre-approved by DIPL and [name of Contractor] prior to commencing works.
Corrective Action(s)	In instances of over clearing, immediately rehabilitate over cleared area. Provide a report, with photos, to DIPL Superintendent. Corrective action shall be implemented to meet required outcomes of this CEMP (where required), this may include: - Hold point on vegetation clearing until all relevant personnel can be re-briefed on proper vegetation clearing management procedures

14.2.9. Fauna Management

Management Strategy	(Detail site specific Management Strategy)
Control(s)	• (Delete all unnecessary management/control items) • All native wildlife must be protected. • All trees to be removed are to be inspected to establish whether nesting native fauna are present. If present, disturbance will only proceed after approval from the DIPL Superintendent. • Fauna spotters/handlers are required where projects require the clearing of mature trees that have a high risk of nesting or roosting opportunities for wildlife and/or where greater than 1 hectare of native vegetation is required to be cleared.

Management Strategy	(Detail site specific Management Strategy)
	• Should a threatened species be identified onsite, stop works in the immediate area, notify the DIPL Superintendent, and install temporary protective barriers to protect the species. • Should any species require relocation/handling or an injured species is found on site, a certified wildlife carer is to be contacted immediately (e.g. Wildcare NT). • There are numerous listed threatened flora and fauna species (and their habitat) within the works areas. These values have been mapped and avoidance areas have been applied. Vegetation clearing is not to occur within the biodiversity avoidance areas shown in Appendix G or the cultural heritage and sacred sites shown in Figure 11 and Appendix B • Prior to vegetation clearing, avoidance buffers will be implemented in the event active Masked Owl or Red Goshawk nests are located near the proposed vegetation clearing areas • A pre-clearance survey will be conducted prior to the clearing and development of the site by a qualified ecologist to identify, protect and translocate any native wildlife animals within the site. • Should a threatened species be identified onsite, all works the immediate area will be stopped, the Superintendent will be notified, and the most appropriate course of action will be determined and documented. • During clearing activities, a qualified snake handler will be present to relocate any snakes found in the project area • The [name of Contractor] qualified environmental officer is to be on hand to inspect excavations each morning and remove any fauna trapped in trenches/pits etc. • Environmental risks will be minimised by following vegetation management strategies: a.) Excluding access to significant vegetation areas or areas with known significant populations of threatened species b.) Selecting appropriately sized clearing machinery and equipment c.) Minimising worksite area d.) Protecting vegetation driplines e.) Locating ancillary activities (e.g. stockpile sites, camps, parking locations, vehicle hardstands) within existing disturbed areas. f). Progressive rehabilitation of disturbed areas at the end of each season of constructions works • 'At the completion of construction and decommissioning, all areas where ponding of water is likely will be altered to ensure they are free draining. • (Add any additional items specific to the job)
Performance Indicator(s)	• No complaints received from AAPA/Land Council/Land owner • No instances of injury or death of native fauna during works • All trapped native fauna safely captured and released by [name of Contractor] environment officer without injury or death

Management Strategy	(Detail site specific Management Strategy)
	• No vegetation clearing or disturbance does occurs within the biodiversity avoidance areas shown in Appendix G or the cultural heritage and sacred sites shown in Figure 11 and Appendix B • No change to the population distribution or abundance of flora and fauna, particularly listed threated species • No night works during breeding season of listed threatened species
Monitoring	• Undertake monitoring (regular and ongoing visual inspection) for the following: o No clearing within biodiversity avoidance areas o Pits, trenches and fenced areas to be inspected each morning for presence of trapped native fauna prior to commencing works
Reporting	• Project Manager/HSE Officer to provide monitoring reports to DIPL (frequency to be pre-approved by DIPL and [name of Contractor] prior to commencing works. • Personnel to report any significant fauna sightings to DIPL. Liaise with DIPL and NT EPA if any significant species are confirmed.
Corrective Action(s)	• In instances of over clearing, immediately rehabilitate over cleared area. Provide a report, with photos, to DIPL Superintendent. • Corrective action shall be implemented to meet required outcomes of this CEMP (where required), this may include: - Hold point on all works until all relevant personnel can be re-briefed on proper fauna management procedures • Where investigations identify environmental nuisance or potential to harm fauna, revision to management plans shall be undertaken and further controls implemented, as necessary.

14.2.10. Pest Animal Management

Management Strategy	(Detail site specific Management Strategy)
Control(s)	• (Delete all unnecessary management/control items) • Ensure that all necessary measures are undertaken to prevent and minimise the risk of the introduction and spread of pest animals. No domestic pets, including dogs, are to be brought to the construction site by construction personnel without written approval from the DIPL Superintendent. If approved, pets must be under control and safely secured at all times. • Provide evidence that pets will be under control and safely secured at all times. • All necessary measures are to be implemented to prevent the establishment of suitable environments for mosquito breeding habitat. Where works are undertaken in areas known for biting insects, personal protective measures are to be made available to workers and visitors.

Management Strategy	(Detail site specific Management Strategy)
	• All waste bins will have lids to prevent the attraction of pests and vermin. Where skips are used for food waste, covers are to be utilised to reduce the risk of attracting pests. • Before entering the Tiwi Islands, all vehicles, plant and machinery will be steam or high-pressure water cleaned to remove all earth/soil to prevent the spread of weeds and pest animals. • Vehicles, plant and machinery will complete a weed hygiene declaration and undergo biosecurity checks prior to entering the Tiwi Islands • A Weeds and Pest Management Plan will be developed by [name of Contractor] as part of the CEMP and implemented during construction and decommissioning. This management plan will include the above mitigations in addition to the following: • Regular and ongoing visual inspections (most importantly following soil disturbance and following rainfall) of the Project area and surrounds to identify, contain, and eradicate the emergence of weeds, as per NT Government Weed Management Handbook (DEPWS, 2018) • (Add any additional items specific to the job)
Performance Indicator(s)	• No complaints received from AAPA/Land Council/Land owner • No introduction, establishment or spread of pest species
Monitoring	Undertake monitoring for the following: • No introduction, establishment or spread of pest species • Regular and ongoing visual inspections (most importantly following importation of plant and machinery to site) of the Project area and surrounds to identify, contain, and eradicate the emergence of pests (particularly Cane Toads)
Reporting	Vehicles, plant and machinery will complete a weed hygiene declaration and undergo biosecurity checks prior to entering the Tiwi Islands
Corrective Action(s)	Project Manager/HSE Officer to provide monitoring reports to DIPL (frequency to be pre-approved by DIPL and [name of Contractor] prior to commencing works. • Where investigations show restricted/declared weeds, and pests present, revision to management plans shall be undertaken and further controls implemented, as necessary. Controls may include use of contracted licensed weed eradicator or pest exterminator.

14.2.11. Fire Management

Management Strategy	(Detail site specific Management Strategy)
Control(s)	• (Delete all unnecessary management/control items) • The lighting of fires for clearing of vegetation or disposal of rubbish is not permitted under any circumstances.

Management Strategy	(Detail site specific Management Strategy)
	• Where fires are accidentally started, extinguish the fires immediately if appropriate and safe to do so. Camp fires are not permitted on site without written consent from the DIPL Superintendent. Where campfires are permitted, control of campfires is strictly the Contractor's responsibility. Fires are not permitted during fire bans. • The provision of containers or sand buckets are required around workers compounds/camp sites and where practical in the worksite for the disposal of cigarette butts. • No hot works are to be undertaken on days of total fire ban or when high winds may result in sparks spreading to adjacent vegetation. • Fire extinguishers are to be located near chemical/dangerous goods stores, flammable materials and appropriately around the site/workers camp. • Fire extinguishers and fire hose reels are to be tested and tagged to show they are in good working condition. • Emergency response plans are to be developed in case of fire. • Mulch stockpiles are to be monitored on a daily basis to ensure that they have not spontaneously combusted. In the event that a much stockpile catches alight, it will be extinguished immediately. • Contractors will adhere to Section 26.5 of the DIPL Standard Specification for Environmental Management (current version). • Contractors will adhere to relevant sections in the Standard Specification for Roadworks. • (Add any additional items specific to the job)
Performance Indicator(s)	• No incidents of fire starting within or surrounding works areas • No smoking on site.
Monitoring	Visual inspections of works areas to ensure no fire hazards are present (include stockpile management actions listed in Section 14.2.4).
Reporting	• Any incidents involving fire will be recorded including time of incident, persons involved, details of incident, mitigation measures and actions taken to minimise the probability of recurrence. • Project Manager/HSE Officer to provide monitoring reports to DIPL (frequency to be pre-approved by DIPL and [name of Contractor] prior to commencing works.
Corrective Action(s)	• In the event of an incident, corrective or remedial action will be taken as is required to render the area safe and avoid or minimise further risk and harm. • In the event of an incident involving fire, work procedures and control measures shall be reviewed to ensure they are fit for purpose and revised where necessary. Corrective action shall be implemented to meet required outcomes of this CEMP (where required), this may include: ○ Hold point on water extraction until all relevant personnel can be re-briefed on proper water extraction management procedures

14.2.12. Air Quality

Management Strategy	(Detail site specific Management Strategy)
Control(s)	• (Delete all unnecessary management/control items) • Construction facilities are to be designed and operated to minimise the emission of smoke, dust, pesticides and other substances into the atmosphere. • Comply with the requirements of the WMPC Act and any conditions of licences, notifications, approvals or permits in relation to maximum air pollutant levels. • Where monitoring is required, the monitoring must comply with the NT EPA air quality guidelines. • Employ construction methods that will keep the air pollution to a minimum. Apply appropriate measures to ensure that airborne pollutants from all activities do not cause undue disruption or inconvenience in the vicinity of the Site. • The following measures, where applicable, are to be conducted to minimise this risk to the environment: - Spraying of earthwork formations and roads with water or other suitable liquids approved by the Superintendent - Removal of mud from the wheels and bodies of haulage equipment before it enters public roads or other sealed pavements - Quick removal of mud spilt or deposited by the transport of materials on to public roads or other sealed pavements - Limit vehicle speeds on unsealed roads/surfaces to control the generation of dust by vehicles - Establishment of suitable cover crop or provision of other covering over topsoil stockpiles - Erection of dust screens around and/or spraying of stockpiles with suitable stabilising agents - Stopping dust generating activities which cannot be adequately controlled by water or other means - Transportation of materials which are suitably covered and loaded in a manner that will prevent dropping of materials - Maintaining dust control equipment so that this equipment is available when required, including periods of dust generating activities or high wind speed - Maintaining exhaust systems of construction plant, vehicles and machinery in accordance with manufacturer's specifications and undertaking periodic visual checks of exhaust systems' emissions - Treating topsoil stripped areas with no scheduled activities within two weeks to prevent dust generation. • All earthwork formations, stockpiles and roads will be sprayed with water (or other suitable liquids) for dust suppression. • Dust generating activities will be stopped if they cannot be adequately controlled by water or dust suppressants.

Management Strategy	(Detail site specific Management Strategy)
	• Materials transported to and from the site are covered and loaded in a manner that will prevent dust generation and spillage of materials. • (Add any additional items specific to the job)
Performance Indicator(s)	• No complaints received from AAPA/Land Council/Land owner • No excessive dust or emissions caused by construction works that causes nuisance to adjacent community or adversely effects significant biodiversity values
Monitoring	Ongoing monitoring of works activities (regular and ongoing visual inspection) by [name of Contractor] site supervisor/environmental officer for and where the surrounding air quality is not suitable for works to continue, the works may be suspended until corrective actions can be employed.
Reporting	Project Manager/HSE Officer to provide monitoring reports to DIPL (frequency to be pre-approved by DIPL and [name of Contractor] prior to commencing works.
Corrective Action(s)	• Increased dust suppression methods where necessary • Corrective action shall be implemented to meet required outcomes of this CEMP (where required), this may include: - Hold point on all works until all relevant personnel can be re-briefed on proper management procedures

14.2.13. Noise and Vibration Control

Management Strategy	(Detail site specific Management Strategy)
Control(s)	• (Delete all unnecessary management/control items) • Operate within the requirements of the NT EPA Noise Guidelines for Development Sites in the Northern Territory and the WMPC Act, or where operation outside of these guidelines is required obtain approval from the DIPL Superintendent to do. • Take all practical precautions to minimise noise resulting from the work activities. Fit noise suppressors to all construction equipment so that noise is minimised. • Do not use loud hailers in built up areas. • Where applicable the following measures will be applied to minimise the impact of noise: - Substitution by an alternative process - Restricting times when noisy work is carried out - Placement of work compounds, parking areas, equipment and material stockpile sites away from noise-sensitive locations - Where noise barriers/walls are to be constructed, programming this as early as possible to reduce noise impacts from other construction work on neighbouring residents - Screening or enclosures - Consultation with affected residents.

Management Strategy	(Detail site specific Management Strategy)
	• Take due care in all construction activities to prevent damage to adjacent public utilities, structures and buildings resulting from construction vibration and air blast. To protect the amenity of the occupiers of buildings, the blasting activities shall be carried out to meet appropriate standards and guidelines. • Consult with affected residents before commencing any activities likely to cause ground vibration or air blasting. • (Add any additional items specific to the job)
Performance Indicator(s)	• No complaints received from AAPA/Land Council/Land owner • No excessive dust or emissions caused by construction works that causes nuisance to adjacent community or adversely effects significant biodiversity values • No night works during breeding season of listed threatened species
Monitoring	The Managing Contractor will undertake noise monitoring activities daily (only when in proximity to sensitive receptors such as Pirlangimpi or Pickertaramoor community) to ensure that noise levels will not create a nuisance to the existing facility or surrounding stakeholders.
Reporting	• Project Manager/HSE Officer to provide monitoring reports to DIPL (frequency to be pre-approved by DIPL and [name of Contractor] prior to commencing works. • Planned noisy works that will exceed the predetermine thresholds shall be notified to DIPL and affected stakeholders such as TLC ahead of time. • Any works required to be undertaken out of normal hours, will be communicated to DIPL and affected stakeholders such as TLC ahead of time.
Corrective Action(s)	• Increased noise and vibration reduction or suppression methods where necessary • Corrective action shall be implemented to meet required outcomes of this CEMP (where required), this may include: ○ Hold point on all works until all relevant personnel can be re-briefed on proper management procedures

14.2.14. Contamination Management

Management Strategy	(Detail site specific Management Strategy)
Control(s)	• (Delete all unnecessary management/control items) • Comply with the WMPC Act in relation to disturbance or treatment of potentially contaminated land. • Immediately implement any control measures needed to divert surface runoff away from contaminated land and to capture and manage any surface runoff contaminated by exposure to contaminated land. • Transportation of chemicals and dangerous goods is to be undertaken in accordance with relevant NT and National legislation, codes and standards.

Management Strategy	(Detail site specific Management Strategy)
	• Plan and execute all works to minimise the possibility of pollution of the site and adjoining areas from chemicals, dangerous goods and other potential contaminants. • Use, store and handle chemicals and dangerous goods in accordance with all relevant legislation, manufacturer's instructions and the relevant Safety Data Sheets (SDS). Employ transporting, handling, storage and application methods that will prevent chemical, fuel and lubricant spillage on the site and adjoining areas. • Contain and maintain on site an up to date SDS Register and copy of all SDSs for those materials stored on site. • Do not pollute or permit pollution of land or waterways by a chemical, fuel or lubricant, or any waste material or imported fill. • Storage of chemicals and fuels is to meet requirements under AS1940-2004 - The Storage and Handling of Flammable and Combustible Liquids. As a minimum the capacity of the bunded area (spillage containment compound) shall be at least 100% of the volume of the largest package plus 25% of the storage capacity up to 10,000 Litres (L), together with 10% of the storage capacity between 10,000 L and 100,000 L, and 5% above 100,000 L. • The bunded storage area shall be sufficiently impervious to retain spillage and to enable recovery of any such spillage. • Do not locate storage areas within 50 m of natural or built drainage lines, flood prone areas, or on slopes steeper than 1:10. • Do not leave refuelling operations unattended. • Do not refuel or maintain plant and equipment, mix cutting oil with bitumen, or carry out any other activity which may result in the spillage of a chemical, fuel or lubricant on any location with direct drainage to a waterway or environmentally sensitive areas without appropriate temporary bunding. • Vehicles and machinery are to be maintained to manufactures specifications to reduce the risk of fuel, oil or hydraulic fluid spills into the surrounding environment. • Where possible, workshops are to have impermeable floors to prevent hydrocarbon spills into the soils. If not, contaminated soils from the workshop area are to be disposed of in accordance with the WMPC Act. • Before discharging any water from bunded areas, verify that the water complies with any applicable legislation or water quality criteria nominated by the NT EPA and/or DENR. Arrange appropriate treatment if the water quality is not suitable for discharge. • Spill clean-up equipment and materials, appropriate for the type and quantities of chemicals used on site, must be kept on site at all times during the works and in a readily accessible location. • The equipment and materials for spill clean-up and containment must be maintained and replenished as needed. • All site personnel must be trained in the use of spill clean-up equipment, and containment of materials, including appropriate storage of chemicals if materials must be on site whilst any works are conducted. All site personnel must be aware of the location of spill kits on sites.

Management Strategy	(Detail site specific Management Strategy)
	• Clean up all chemical spills immediately. This may require the excavation of contaminated soil and appropriate remediation or disposal at waste disposal facility. If spills result in an environmental incident, ensure that the incident is reported in accordance with reporting procedures and legislative requirements. • Do not dispose of liquid paint materials or other hazardous materials by flushing down any sewer, stormwater system or natural waterway. • Keep records of all water quality checks, discharges and any remedial actions. • Report all chemical spills to the DIPL Superintendent. Where appropriate, also report spills to the NT Pollution Hotline, phone 1800 064 567. • An Asbestos Management Plan (AMP) is required if Contractors are engaged to conduct works at locations where the nature of their works will or are likely to disturb any asbestos or asbestos containing material. An AMP will also be required in the event Asbestos is unexpectedly exposed or discovered during works (ex. illegally dumped asbestos building demolition materials, etc). • Where Potential Acid Sulphate Soils (PASS) and actual ASS are likely to be present in sediments on the site, [name of Contractor] shall develop and implement procedures through an ASS Management Plan to prevent acidic discharge and odour from any exposed soils within the construction site or from soils removed from the site. • (Add any additional items specific to the job)
Performance Indicator(s)	• No complaints received from AAPA/Land Council/Land owner • No environmental harm occurs as a result of the use, storage and transport of contaminants of concern i.e. Petroleum, Oil & Lubricants (POL) • Manage contaminants so as to avoid contamination of surrounding soils and surface and groundwater • No complaints are received from regulatory authorities or the community in relation to the storage and utilisation of fuel and hazardous materials.
Monitoring	• Regular and ongoing visual inspections of site to ensure no oil leaks, hydraulic fluid leakages or fuel leakages/spills of any other hazardous material. • Regular and ongoing visual inspection of spoil piles for indicators of soil contamination (i.e. odour, colour, staining, etc.) shall be undertaken. • Any finds of contaminated land, hazardous substances, ASS or ACC will be documented and reported to DIPL. • Inform DIPL and NT EPA immediately of any incidents (spills, leaks) resulting in potential or actual environmental harm.
Reporting	• An incident register shall be maintained which includes time of incident, persons involved, details of incident, mitigation measures and actions taken to minimise the probability of recurrence and persons notified

Management Strategy	(Detail site specific Management Strategy)
	• If stormwater event or spill occurs that has the potential to cause environmental harm and/or breach the EPL, then notify NT EPA as soon as reasonable.
Corrective Action(s)	Corrective action shall be implemented to meet required outcomes of this CEMP (where required), this may include: - Hold point on all works until all relevant personnel can be re-briefed on proper management procedures - Rehabilitation of contaminated areas

14.2.15. Waste Management

Management Strategy	(Detail site specific Management Strategy)
Control(s)	• (Delete all unnecessary management/control items) • Comply with the requirements of the WMPC Act. • Remove from the site and dispose of all waste materials, including green waste, food scraps and other putrescible wastes, construction waste, chemicals and effluent in an appropriate manner, in approved legal waste disposal sites or facilities. • Recycle waste materials where appropriate. • Maintain a Waste Management Register for the duration of the Contract, to record the types, amounts and locations of waste reused, recycled, stockpiled and / or disposed of. The Waste Management Register must include the following details: - Type of waste and its classification (according to the WMPC Act and DENR Waste Classification Guidelines) (Schedule 2 of the Waste Management and Pollution Control Regulations) - Tonnes of waste - How and where the waste was reused, recycled, stockpiled or disposed - Date when the waste was reused, recycled, stockpiled or disposed - Name of the transporter used (Person or Business name) - Be able to produce receipt of commercial disposal if requested. • Implement measures to reduce, re-use and recycle construction waste products/materials including soil, road pavement materials, concrete, oils and vegetation. • Implement measures to recycle waste such as cardboard, plastic and glass bottles and aluminium cans. • Ensure that all effluent from amenities is discharged into an approved facility or, if permitted by the controlling authority, the local sewerage system. Effluent disposal direct to ground or water is NOT permitted. • Septic tanks and portable self-contained toilets of suitable capacity may be used subject to suitable arrangements for the disposal of effluent. • Where the use of septic tanks or portable toilets is not reasonable or practical, pit toilets may be used, but this requires the prior written approval of the DIPL Superintendent. Any pit toilets constructed must

Management Strategy	(Detail site specific Management Strategy)
	be at least 100m from any bore, at least 200m from any watercourse and sites appropriately rehabilitated on completion. • All septic tank installations or alternative septic systems servicing buildings both within and outside of building areas, apart from installations subject to the *Building Act*, must be approved by the Chief Health Officer (CHO) or the CHO's delegate for the area in which the works are to be carried out. • (Add any additional items specific to the job)
Performance Indicator(s)	• No complaints received from AAPA/Land Council/Land owner • To ensure no environmental harm occurs as a result of waste disposal • Manage wastes so as to avoid contamination of surrounding soils and watercourses • All wastes disposed of in accordance with the conditions of the CEMP
Monitoring	• Conduct litter and waste disposal visual inspections as part of ongoing assessments by [name of Contractor] environmental officer monitoring
Reporting	• If a trend above trigger levels or increasing contaminant levels that may cause environmental harm to surface water or groundwater is detected, immediately report to NT EPA and commence corrective actions • Liaise with NT EPA if an exceedance has occurred within a reasonable time period upon discovery
Corrective Action(s)	• If non-approved or hazardous waste is detected by staff, report to the Supervisor immediately and arrange for removal

14.2.16. Rehabilitation

Management Strategy	(Detail site specific Management Strategy)
Control(s)	• (Delete all unnecessary management/control items) • Progressively rehabilitate extraction areas to reduce the area of exposed soil during construction works. • Following excavation of the required material, any unused rock and gravel material will be spread back over the extraction area. The extraction area "floor" is to be ripped using dozer or grader tynes to a depth of 100mm to 200mm to loosen the floor to encourage new plants to establish. Ripping is to be carried out along contour lines to reduce or prohibit the extent of erosion. • The previously stripped and stockpiled material including topsoil and overburden will be pushed back over the excavation, detour or access track. The stockpiled topsoil is spread over the disturbed areas to encourage regrowth from the soils seed store. The surface of the topsoil will be scarified which will further enhance the ability of the material to trap mobile seeds, dust and moisture. • Where specified in the RFT/RFQ native seed will be broadcast either by hand or machine across disturbed areas.

Management Strategy	(Detail site specific Management Strategy)
	• Cleared vegetation from the project area, detours access tracks and extraction area will be spread prior to demobilisation to assist the re-colonisation of flora and fauna across the site. • DIPL and its Contractors are committed to the progressive rehabilitation of each 1 ha gravel extraction area throughout the construction phase of the Project and beyond. This program is one of the key environment protection and management principals, developed with the existing environmental conditions and associated key risks of the Project in mind. These principals will include, but not be limited to the following: ▪ Provide the conditions conducive to rehabilitation of pre-existing vegetation quickly upon completion of the works ▪ The extraction area "floor" is to be ripped using dozer or grader tyres to a depth of 100 mm to 200 mm to loosen the floor to encourage new plants to establish. Ripping is to be carried out along contour lines to reduce erosion. ▪ The previously stripped and stockpiled material including topsoil and overburden is to be pushed back over the excavation, detour or access track. The topsoil will contain a natural seedbank. The surface of the topsoil is to be scarified along the contours which will further enhance the ability of the material to trap mobile seeds, dust and moisture. ▪ Spreading of cleared and stockpiled vegetative matter over disturbed areas prior to demobilisation. This will provide micro-habitats to assist the re-colonisation of flora and fauna across the site as well as slow run-off. ▪ Progressively rehabilitate extraction areas i.e. rehabilitate one pit before moving to the next. ▪ On completion of the works remove all facilities, unless otherwise agreed in writing with the owner or lessee of the land and restore the site to a clean and tidy condition. ▪ Rehabilitate the site to the satisfaction of the TLC and DIPL, with the intention recruitment and regeneration of native species will return the site to pre-construction vegetation community. ▪ [name of Contractor] will assume all responsibility for any current and consequential damage caused to the site as a result of occupation and pay for all remedial action required. • (Add any additional items specific to the job)
Performance Indicator(s)	• No complaints received from AAPA/Land Council/Land owner • No introduction, establishment or spread of weed or pest species • The site is naturally revegetated by native species known to the area
Monitoring	• Undertake regular and ongoing monitoring (visual inspections) of the following: o Evidence of revegetation of native, species known to the area

Management Strategy	(Detail site specific Management Strategy)
	○ No introduction, establishment or spread of weed or pest species ○ No evidence of erosion or sedimentation within and surrounding the site
Reporting	Project Manager/HSE Officer to provide monitoring reports to DIPL (frequency to be pre-approved by DIPL and [name of Contractor] prior to commencing works.
Corrective Action(s)	In instances of over clearing, immediately rehabilitate over cleared area. Provide a report, with photos, to DIPL Superintendent. Should rehabilitation objectives or performance indicators not be met [Name of Contractor] environment officer to consult with DIPL to formulate corrective actions.

15. Appendices

15.1. Appendix A – Environmental Risk Assessment

ID	THEME	ENVIRON-MENTAL FACTOR	Environmental Objective	POTENTIAL IMPACT (How the Project interacts with assets, values, uses and location. Include clear description of the cause)	CONSEQUENCE (Clearly understand what is the final impact. Describe whether it is construction, operation or decommissioning)	EXISTING CONTROL MEASURES	INITIAL RISK RATING			ADDITIONAL CONTROL MEASURES	RESIDUAL RISK RATING		
							C	L	RR		C	L	RR
1. Land													
1.1.1		1.1 Landforms	Conserve the variety and integrity of distinctive physical landforms.	1.1.1 Stockpiling of soil, vegetation and road base material during construction leads to alteration of landforms via erosion and sedimentation.	1.1.1.1 Landscape function is degraded as vegetation stockpiles facilitate erosion and sedimentation. 1.1.1.2 Erosion of the landscape and build up of sediments in low-lying areas, drainage pathways and waterways.	Soil handling activities will primarily be conducted during the dry season, eliminating the impacts of significant rain events on soil handling and stockpiling activities. Buffer zones of 20 metres will be maintained between stockpiles and and around draining lines. All stockpiles are managed and handled in accordance with the Erosion Sediment Control Plan. Stockpiles are positioned on flat ground, and not in close proximity to natural vegetation (buffer of 20 metres). Green waste stockpiles are kept at a maximum height of 2 metres prior to the onset of wet season to reduce risk of debris being blown away or disturbed during extreme weather events. The toe of soil and road base material stockpiles is bunded prior to the onset of the wet season to prevent soil movement during wet weather events.	**3 - Moderate**	**3 – Possible**	**9 - Medium**	Contractors will adhere to Section 21 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 2.16.2 and 16.4.4 of the Standard Specification for Roadworks ver 4.2	**3 - Moderate**	**1 – Rare**	**3 - Low**
1.1.2				1.1.2 Vehicles accessing water resources (natural water bodies and bore locations) causing land and bank erosion on tracks accessing water points.	1.1.2.1 Erosion of the landscape and build up of sediments in low-lying areas, drainage pathways and waterways. Decline in surface water quality due to track erosion.	Construction and water resource management activities will primarily be conducted during the dry season, eliminating the impacts of significant rain events on vehicular access routes and minimising the potential of access track erosion and its consequences. Assessment of each natural water body source point will be assessed for suitability of access. Vehicles will use new and existing tracks only. Driving through waterways with unmarked tracks or tracks without construction controls will not be permitted. New and existing tracks will be gravel laid prior to use by water trucks to prevent erosion. Tracks and turnarounds will be set well back from waterholes and creeks to protect bank integrity and keep sensitive riparian vegetation undisturbed.	**3 - Moderate**	**2 – Unlikely**	**6 - Medium**	Contractors will adhere to Section 23.4 and Section 24.2 of the DIPL Standard Specification for Environmental Management ver 2.0	**3 - Moderate**	**1 – Rare**	**3 - Low**
1.1.3				1.1.3 The creation of gravel pits during construction leads to alteration of landforms via erosion and sedimentation.	1.1.3.1 Landscape function is degraded and surrounding habitats are fragmented, damaged and/or lost.	Gravel pit excavations will primarily be conducted during the dry season, eliminating the impacts of significant rain events on gravel handling and stockpiling activities. All bare ground earthworks are stabilised (by vehicular compaction) to progressively return the soil to a stable, non-eroding condition equal to or better than the existing condition. Toe of soil and gravel stockpiles will be bunded prior to the onset of the wet season to prevent soil movement during wet weather events.	**3 - Moderate**	**3 – Possible**	**9 - Medium**	Contractors will adhere to Section 19 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 4 of the Standard Specification for Roadworks ver 4.2 A gravel pit management plan will be developed by the contractor that will outline controls for erosion and sediment control, and progressive rehabilitation.	**3 - Moderate**	**1 – Rare**	**3 - Low**
1.2.1		1.2 Terrestrial environmental quality		1.2.1 Vegetation clearing of the project area leads to exposed soils, land degradation and soil erosion.	1.2.1.1 Soils are destabilised and eroded by wind and water. Erosion leads to changed landforms and sedimentation.	Vegetation clearing activities will be conducted during the dry season, eliminating the impacts of rain and wind events on vegetation stockpiling and exposed ground surfaces. All earthwork formations, stockpiles and roads will be sprayed with water (or other suitable liquids) for dust suppression. Dust generating activities will be stopped if they cannot be adequately controlled by water or dust suppressants. Materials transported to and from the site are covered and loaded in a manner that will prevent dust generation and spillage of materials. A Traffic Management Plan will be developed and implemented prior to project initiation. Soil erosion measures as specified in 1.1.2 will be implemented. Erosion and sediment control measures comply with the following requirements: a.) Early installation of all drainage erosion and sediment control measures. b.) Control measures will be in place prior to the commencement of works c.) All erosion and sediment control measures are to be installed and maintained in good working order. d.) Any runoff from the site will comply with the requirements of the DEPWS Guidelines and relevant legislation. e.) Contractor daily site inspections will consist of visual assessment of erosion and sediment control structures to verify their condition and effectiveness. Records of inspections will be kept and made available upon request. f.) Control measure will be inspected throughout the duration of works and particularly following each rain event. g.) Control measures will be rearrange and reposition as required to maintain their efficiency. h.) Sediment collected by control measures will be handled and disposed of in a manner approved by the Superintendent. i.) All temporary control measures will be removed following rehabilitation or when otherwise no longer required.	**3 - Moderate**	**3 – Possible**	**9 - Medium**	Contractors will adhere to Section 6 of the DIPL Standard Specification for Environmental Management ver 2.0. An approved Erosion and Sediment Control Plan (ESCP) to be implemented during construction. Contractors will adhere to Section 3 of the Standard Specification for Roadworks ver 4.2.	**3 - Moderate**	**2 – Unlikely**	**6 - Medium**

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							C	L	RR		C	L	RR
1.2.2		1.2 Terrestrial environmental quality	Protect the quality and integrity of land and soils so that environmental values are supported and maintained	1.2.2 Stockpiling of soil and vegetative material (e.g. logs) during construction leads to spontaneous combustion or increased fuel fire load.	1.2.2.1 Fire leads to loss of vegetation, loss of habitat for fauna and a safety hazard for construction personnel.	Lighting of fires for clearing of vegetation or disposal of rubbish is prohibited at all times. Accidental fires are extinguished immediately if appropriate and safe to do. Stockpiled vegetation and mulch height is kept under 2.25 meters and will be turned over every 2 weeks following placement to reduce risk of pyrolysis and spontaneous combustion. A designated smoking area will be provided at the site office with butt disposal bins. Appropriate and sufficient firefighting equipment is accessible, sign posted and inspected and maintained in accordance with relevant Australian Standards. All potential sources of sparks, flame or heat which may generate fire will be identified and eliminated. The Contractor will establish protocols to ensure early detection and communication of fires to appropriate authorities, including fire awareness training for staff and sub-contractors in high fire risk areas.	**3 - Moderate**	**2 – Unlikely**	**6 - Medium**	Contractors will adhere to Section 26.5 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 4 of the Standard Specification for Roadworks ver 4.2..	**3 - Moderate**	**1 – Rare**	**3 - Low**
1.2.3		1.2 Terrestrial environmental quality		1.2.3 Soil contamination (e.g. surface soils) by oil, fuels and lubricant spills.	1.2.3.1 Soil are contaminated during construction with fuels and other chemicals used for the construction of the roads.	Chemicals and dangerous goods will be applied, stored, transported and handled in accordance with all relevant legislation, manufacturer's instructions and the relevant Safety Data Sheets. Temporary bunding will be applied when refueling or maintaining plant and equipment, mix cutting oil with bitumen, or any other activity which may result in the spillage of a chemical, fuel or lubricant on any environmentally sensitive area. Any water discharged from bunded areas will comply with applicable legislation and if required be appropriately treated prior to discharge. Spill clean-up and containment equipment and materials, appropriate for the type and quantities of chemicals used on site, will be kept on site at all times during the works and in a readily accessible location and when fuel operated machinery is being used and machinery operators will be trained in the use of the spill kit. All chemical spills will be reported to the Superintendent. All chemical spills will be cleaned up immediately. This may require the excavation of contaminated soil and appropriate remediation or disposal at waste disposal facility. If spills result in an environmental incident, that incident will be reported in accordance with reporting procedures and legislative requirements.Where appropriate, spills will also be reported to the NT Pollution Hotline, phone 1800 064 567. All site personnel will be trained in containment of materials, including appropriate storage of chemicals if materials must be on site whilst any works are conducted on site. All site personnel will be aware of the location of spill kits on sites.	**2 - Minor**	**2 – Unlikely**	**4 - Low**	'Contractors will adhere to Section 33.1 and 33.2 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 1.13.3 of the Standard Specification for Roadworks ver 4.2	**2 - Minor**	**2 – Unlikely**	**4 - Low**
1.2.4		1.2 Terrestrial environmental quality		1.2.4 Construction excavation activities expose acid sulphate soils to the air.	1.2.4.1 Potential acid sulphate soils, when exposed to the air, can create sulfuric acid, which can be mobilised by rainfall and damage can damage local flora and fauna and wash it in to waterways.	Eliminate risk by avoiding gravel pits in potential acid sulfate soil (ASS)-containing locations Although currently not expected to encounter acid sulfate soils (ASS), Project areas that are in close proximity to modelled 'high probability' ASS will be undertaken prior to commencement of gound disturbing works. If areas designated for excavations (gravel pits or road corridors) exhibit signs of the presence of ASS, sampling will confirm the absence before excavation continues. Where ASS risks are found, an Acid Sulphate Soils Management Plan will be developed prior to commencement of ground disturbing works. The closest 'high propbability' ASS areas (mapped on NR MAPS: DEPWS, 2021) are a). approximately 400 m south of Pirlangimpi Road (one location associated with a first order intermittent stream draining to the Bremer River), and b). 250m either side of the barge landing road in Pirlangimpu community.	**3 - Moderate**	**1 – Rare**	**3 - Low**	Contractors will adhere to Section 7 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 1.26 of the Standard Specification for Roadworks ver 4.2	**2 - Minor**	**1 – Rare**	**2 - Low**
1.2.5		1.2 Terrestrial environmental quality		1.2.5 New weed species are introduced and established, and/or existing weed species spread into new areas, as a result of movement of machinery and equipment.	1.2.5.1 Increased pressure on surrounding environment through competition with weeds for resources and fauna through habitat changes.	Control and/or eradication of weeds within the site will occur in accordance with the Weeds Management Act. A Weeds and Pest Management Plan will be developed and implemented during construction. This will ensure that no declared weeds are spread or introduced within the site for the duration of the works. The reuse of weed contaminated topsoil by surface spreading is not permitted. Where necessary, horticultural advice will be sought to determine whether the type and/or proportion of weed cover is significant for the topsoil to be deemed weed contaminated. Vehicles and plant will be steam cleaned or high pressure water cleaned to remove all earth/soil to prevent the spread of weeds and pest animals before entering site from declared areas of weed and pest infestation. Excavated earth and organic material will be collected and disposed of the by a method that will ensure that it does not infest any river, stream, wetland or property. If declared weeds are present within the work area, all vehicles and mechanical plant will be steam cleaned or high pressure water clean to remove earth and organic matter before leaving the designated infested area.	**4- Major**	**3 – Possible**	**12 - High**	Contractors will adhere to Section 8 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 1.13.3 of the Standard Specification for Roadworks ver 4.2	**4- Major**	**2 – Unlikely**	**8 - Medium**

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							C	L	RR		C	L	RR
1.2.6	1. Land	1.2 Terrestrial environmental quality		1.2.6 Through construction, volumes of construction waste will be generated and will require disposal.	1.2.6.1 Waste which is not disposed appropriately leads to degradation of the surrounding environment. This negatively impacts on terrestrial environmental quality (contamination and ecosystem degradation), aquatic ecosystems (contamination and degradation) and social aspects (visual amenity and potential degradation to hunting grounds).	Illegal dumping is strictly prohibited. All waste materials, including green waste food scraps and other putrescible wastes, construction waste, chemicals and effluent waste will be removed from the site and disposed of in an appropriate and timely manner. Waste materials will be recycled where practical. A Waste Management Register will be maintained to record the types, amounts and location of waste recycled, stockpiled and/or disposed of for the duration of the Project. Designated disposal areas (covered, do not discard into natural areas) will be applied. A waste management hierarchy will be applied when dealing with waste (avoid, reduce, reuse, recycle, recover, treat, dispose).	**2 - Minor**	**3 – Possible**	**6 - Medium**	Contractors will adhere to Section 33 and 34 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 1.9.2 of the Standard Specification for Roadworks ver 4.2	**2 - Minor**	**1 – Rare**	**2 - Low**
1.2.7		1.2 Terrestrial environmental quality		1.2.7 Construction personnel waste is released into the environment impacting on amenity and impacts on local fauna. Construction workers personal waste inappropriately disposed on site.	1.2.7.1 Waste which is not disposed appropriately leads to degradation of the surrounding environment. This negatively impacts terrestrial environmental quality (contamination and ecosystem degradation, Fauna attracted to waste on site leading to injury in proximity to construction activities), aquatic ecosystems (contamination and degradation) and social aspects (visual amenity and potential degradation to hunting grounds).	Illegal dumping is strictly prohibited. All waste materials, including green waste food scraps and other putrescible wastes, construction waste, chemicals and effluent waste will be removed from the site and disposed of in an appropriate and timely manner. Waste materials will be recycled where practical. A Waste Management Register will be maintained to record the types, amounts and location of waste recycled, stockpiled and/or disposed of for the duration of the Project. Designated disposal areas (covered, do not discard into natural areas) will be applied. A waste management hierarchy will be applied when dealing with waste (avoid, reduce, reuse, recycle, recover, treat, dispose).	**2 - Minor**	**4 – Likely**	**8 - Medium**	Contractors will adhere to Section 33 and 34 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 1.9.2 of the Standard Specification for Roadworks ver 4.2	**2 - Minor**	**2 – Unlikely**	**4 - Low**
1.3.0				1.3.0 Pest species are introduced and established.	1.3.0.1 Pest species cause increased competition with native species for some food types and habitat resources. Pest species also predate on native species. 1.3.0.2 Melville island is currently free of Cane Toads. Introduced Cane Toads cause mortality of a suite of fauna (including listed threatened species) from poisoning following predation.	A Weeds and Pest Management Plan will be developed and implemented during construction and decommissioning. Vehicles, plant and machinery will complete a weed hygiene declararion and undergo biosecurity checks prior to entering the Tiwi Islands. Vehicles and plant will be steam cleaned or high pressure water cleaned to remove all earth/soil to prevent the spread of weeds and pest animals before being transported to the island. Domestic pets are not permitted on site by construction personnel without written approval. If pets are approved, pets will be under control and safely secured at all times. All waste materials, including green waste, food scraps and other putrescible wastes, construction waste chemicals and effluent will be removed from the site and disposed of in an appropriate and timely manner.	**4- Major**	**3 – Possible**	**12 - High**	Contractors will adhere to Section 8 and 28 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 1.6.3 of the Standard Specification for Roadworks ver 4.2	**4- Major**	**2 – Unlikely**	**8 - Medium**
1.3.1				1.3.1 Construction and decommissioning activities (e.g. vehicle movements, digging) impact on biodiversity through loss and/or disturbance of threatened flora species	1.3.1.1 Direct (mortality) and indirect (Loss or disturbance of habitat) impacts to flora from vegetation clearing required for construction. 1.3.1.2 Impact on individual or population of flora (including listed threatened species) that will: - lead to a long-term decrease in the size of a population - reduce the area of occupancy of the species - fragment an existing population into two or more populations - adversely affect habitat critical to the survival of a species - disrupt the breeding cycle of a population - modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	Vegetation will not be destroyed, removed or cleared to an extent greater than is necessary for the execution of the works. Micro-siting of gravel pit extraction areas to avoid and minimise impacts to known populations of threatened flora species. Environmental risks will be minimised by following vegetation management strategies: a.) Excluding access to significant vegetation areas or areas with known significant populations of threatened species b.) Selecting appropriately sized clearing machinery and equipment c.) Minimising worksite area d.) Protecting vegetation driplines e.) Locating ancillary activities (e.g. stockpile sites, camps, parking locations, vehicle hardstands) within existing disturbed areas. f). Progressive rehabilitation of disturbed areas at the end of each season of constructions works	**3 - Moderate**	**2 – Unlikely**	**6 - Medium**	Contractors will adhere to Section 26 and 27 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 3 and 16.4.2 of the Standard Specification for Roadworks ver 4.2 Contractors will adhere to NT Land Clearing Guidelines (DENR, 2021) avoidance restrictions	**3 - Moderate**	**1 – Rare**	**3 - Low**

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							C	L	RR		C	L	RR
1.3.2		1.3 Terrestrial ecosystems	Protect terrestrial habitats to maintain environmental values including biodiversity, ecological integrity and ecological functioning	1.3.2 Construction and decommissioning activities impact on biodiversity through loss and/or disturbance of threatened fauna species	1.3.2.1 Direct (mortality) and indirect (Loss or disturbance of potential foraging, sheltering and breeding habitat) impacts to fauna from vegetation clearing and increased traffic volumes required for construction. 1.3.2.2 Impact on individual or population of fauna (including listed threatened species) that: - leads to a long-term decrease in population size; reduces area of occupancy of the species; fragments an existing population; adversely affects habitat critical to the survival of a species; disrupts the breeding cycle of a population; modifies, destroys, removes, isolates or decreases the availability or quality of habitat to the extent that the species declines.	A pre-clearance survey will be conducted prior to the clearing and development of the site by a qualified ecologist to identify, protect and translocate any native wildlife animals within the site. Should a threatened species be identified onsite, all works the immediate area will be stopped, the Superintendent will be notified, and the most appropriate course of action will be determined and documented. During clearing activities, a qualified snake handler will be present to relocate any snakes found in the project area A qualified ecologist to be on hand to inspect excavations each morning and remove any fauna trapped in trenches/pits etc. Environmental risks will be minimised by following vegetation management strategies: a.) Excluding access to significant vegetation areas or areas with known significant populations of threatened species b.) Selecting appropriately sized clearing machinery and equipment c.) Minimising worksite area d.) Protecting vegetation driplines e.) Locating ancillary activities (e.g. stockpile sites, camps, parking locations, vehicle hardstands) within existing disturbed areas. f). Progressive rehabilitation of disturbed areas at the end of each season of constructions works	**3 - Moderate**	**2 – Unlikely**	**6 - Medium**	Contractors will adhere to Section 26 and 27 of the DIPL Standard Specification for Environmental Management ver 2.0 Contractors will adhere to Section 3 and 16.4.2 of the Standard Specification for Roadworks ver 4.2	**3 - Moderate**	**1 – Rare**	**3 - Low**
1.3.3				1.3.3 Over-extracting from waterholes and creeks impacting some fauna which depend on year-round waterholes	1.3.3.1 Direct (mortality) and indirect (Loss or disturbance of potential foraging, sheltering and breeding habitat) impacts to flora and fauna (including GDEs) from reduction in availability of surface water supply.	Water extraction should be limited or concentrated towards the early part of the dry season when water demand will be less and water supply is greater. Only 20% of flow or volume of a waterbody will be utilised in the Top End. No dams or bunds on a natural watercourse will be constructed. Where a standing water body is <500mm deep or extraction from a water body is likely to exceed 20%, an alternative water source will be sought. Any water to be extracted from groundwater bores (new and existing) or surface water bodies requires the explicit permission of the necessary stakeholders including Tiwi Land Council, DEPWS and relevant sacred sites authorities, among others.	**3 - Moderate**	**1 – Rare**	**3 - Low**	Contractors will adhere to Section 23 and 24 of the DIPL Standard Specification for Environmental Management ver 2.0	**3 - Moderate**	**1 – Rare**	**3 - Low**
1.3.4				1.3.4 Increased traffic volumnes for construction increase likelihood of fauna vehicle collisions	1.3.4.1 Impact on individual or population of fauna (including listed threatened species) that: - leads to a long-term decrease in the size of a population - disrupts the breeding cycle of a population	A CEMP will be developed that includes approproate speed limits on the roads within and surrounding the construction area. Contractor and workforce awareness of fauna vehicle collisions to encourage appropriate speeds and avoidance of night, diusk and dawn driving to reduce likelihood of this impact occuring.	**2 - Minor**	**3 – Possible**	**6 - Medium**		**2 - Minor**	**2 – Unlikely**	**4 - Low**
1.3.5				1.3.5 Lowering surface water levels by over-pumping can potentially cause springs and wetlands to dry up, and nearby streams to cease to flow	1.3.5.1 Direct (mortaily) or indirect (reduction in health or quailty of habitat) impacts to GDE ecosystems	'For this reason, it is important to concentrate the roadworks to the early periods in the dry when water demand will be less, and water supplies more. In general, an average wet season will replenish aquifers, waterholes, and creeks. Utilise construction water bores with a sustainable yield and monitor flow rates. Cease use if flow rate drops 20%.	**3 - Moderate**	**1 – Rare**	**3 - Low**	Contractors will adhere to Section 23 and 24 of the DIPL Standard Specification for Environmental Management ver 2.0	**3 - Moderate**	**1 – Rare**	**3 - Low**
1.3.6				1.3.6 Over-extraction of groundwater during the dry season may lower groundwater levels	1.3.6.1 Direct (mortality) and indirect (Loss or disturbance of potential habitat) impacts to GDEs from reduction in availability of surface water supply.	Water extraction to the early part of the dry season when water demand will be less and water supply is greater. Only 20% of flow or volume of a waterbody will be utilised in the Top End.	**3 - Moderate**	**1 – Rare**	**3 - Low**	Contractors will adhere to Section 23 and 24 of the DIPL Standard Specification for Environmental Management ver 2.0	**3 - Moderate**	**1 – Rare**	**3 - Low**

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							C	L	RR		C	L	RR
1.3.7				1.3.7 Noise, dust and vibration generated during construction and decommissioning impact on native fauna and flora.	1.3.7.1 Direct (mortality) and indirect (Loss or disturbance of potential foraging, sheltering and breeding habitat) impact on flora and fauna from vegetation clearing, increased use of plant and machinery and higher traffic volumes during construction and decommissioning. 1.3.7.2 Impact on individual or population of fauna (including listed threatened species) that: - leads to a long-term decrease in population size; reduces area of occupancy of the species; fragments an existing population; adversely affects habitat critical to the survival of a species; disrupts the breeding cycle of a population; modifies, destroys, removes, isolates or decreases the availability or quality of habitat to the extent that the species declines.	Earthwork formations, stockpiles and roads will be sprayed with water or other suitable liquids for dust suppression. Dust generating activities which cannot be adequately controlled by water or other means will be stopped until adequate controls can be put in place. All materials transported on and/or off site will be suitably covered and loaded in a manner that will prevent dropping of materials. Exhaust systems of construction plant, vehicles and machinery will be maintained in accordance with manufacturer's specification and exhaust systems will be periodically inspected. Any equipment that is found to be defective will be decommissioned. A Traffic Management Plan will be developed and implemented prior to the commencement of construction and decommissioning activities. Where applicable the following measures will be applied to minimise the impact of noise: a.) Substitution by an alternative process b.) Restricting times when work is carried out c.) Screening or enclosures.	**3 - Moderate**	**2 – Unlikely**	**6 - Medium**	Contractors will adhere to Section 33 and 34 of the DIPL Standard Specification for Environmental Management ver 2.0	**3 - Moderate**	**1 – Rare**	**3 - Low**
2. Water													
2.1.1		2.1 Hydrological processes	Protect the hydrological regimes of groundwater and surface water so that the environmental values including ecological health, land uses and the welfare and amenity of people are maintained.	2.1.1 Changes to local hydrology pathways and processes due to placement of construction materials, equipment and final road built form.	2.1.1.1 Reduced water flow and changes to flow patterns leads to direct (mortality) and indirect (Loss or disturbance of potential foraging, sheltering and breeding habitat) impacts on flora and fauna	The Project area does not intersect any waterbodies. Buffers and no-go areas will be applied to permanent and intermittent drainage areas. Tracks and turnarounds will be set well back from waterholes and creeks to protect bank integrity and keep sensitive riparian vegetation undisturbed.	**3 - Moderate**	**1 – Rare**	**3 - Low**	Contractors will adhere to Section 23 and 24 of the DIPL Standard Specification for Environmental Management ver 2.0	**3 - Moderate**	**1 – Rare**	**3 - Low**
2.1.2				2.1.2 Over-extraction of surface water	2.1.2.1 Creek ceases to flow or waterhole dries up, or hydrology altered. If surface water body is in connection with underlying aquifer, groundwater tables nearby may be lowered causing bores to fork.	Only 20% of flow or volume of a waterbody should be utilised in the Top End. Do not construct dams or bunds on a natural watercourse. Where a standing water body is <500mm deep or extraction from a water body is likely to exceed 20%, an alternative water source should be sought, or if none are available, consult the Departments Environmental Services Branch for guidance.	**2 - Minor**	**2 – Unlikely**	**4 - Low**	Contractors will adhere to Section 23 and 24 of the DIPL Standard Specification for Environmental Management ver 2.0	**2 - Minor**	**1 – Rare**	**2 - Low**
2.1.3				2.1.3 Reduced flows in creek due to water extraction for dust suppression.	2.1.3.1 Reduced water flow and changes to flow patterns affects the health of native flora and fauna.	Only 20% of flow or volume of a waterbody should be utilised in the Top End. Do not construct dams or bunds on a natural watercourse. Streams are either spring fed or ephemeral.	**2 - Minor**	**2 – Unlikely**	**4 - Low**	'Contractors will adhere to Section 23 and 24 of the DIPL Standard Specification for Environmental Management ver 2.0	**2 - Minor**	**1 – Rare**	**2 - Low**
2.1.4				2.1.4 Degrading river banks and edges of waterbodies from traffic and use of plant.	2.1.4.1 Erosion and destabilisation of banks and surrounding areas. Degradation of local vegetation and fauna. Degradation of water quality from siltation.	Protect the banks and beds of any waterhole or river used for water extraction. Existing access tracks to surface water soures should be used. Keep vehicles away from the edge as much as possible by setting turnarounds away from water source and running layflat. Any damage incurred in the course of water extraction should be immediately repaired and the area rehabilitated. Access tracks should be prepared in order to prevent erosion and degradation.	**2 - Minor**	**2 – Unlikely**	**4 - Low**	Contractors will adhere to Section 21 - 24 of the DIPL Standard Specification for Environmental Management ver 2.0	**2 - Minor**	**1 – Rare**	**2 - Low**
2.1.5				2.1.5 Degrading water quality	2.1.5.1 Use and storage of fuels, lubricants near water bodies.	No fuels, lubricants or equipment other than pumping equipment are permitted to enter or remain at the water body. Non-permeable bunding in accordance with AS 1940 is to be provided around pump and generator equipment.	**3 - Moderate**	**1 – Rare**	**3 - Low**	Contractors will adhere to Section 21 - 24 of the DIPL Standard Specification for Environmental Management ver 2.0	**3 - Moderate**	**1 – Rare**	**3 - Low**
2.1.6				2.1.6 Groundwater extraction may cause a decline in local groundwater levels. Pumping a bore causes a cone of depression to form around the bore which decreases away from the bore.	2.1.6.1 Death or desctruction native flora	For this reason, it is important to concentrate the roadworks to the early periods in the dry when water demand will be less, and water supplies more. In general, an average wet season will replenish aquifers, waterholes, and creeks. Utilise construction water bores with a sustainable yield and monitor flow rates. Cease use if flow rate drops 20%.	**3 - Moderate**	**1 – Rare**	**3 - Low**	Contractors will adhere to Section 23 of the DIPL Standard Specification for Environmental Management ver 2.0	**3 - Moderate**	**1 – Rare**	**3 - Low**

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							C	L	RR		C	L	RR
2.1.7	2. Water			2.1.7 Over-extraction of water	2.1.7.1 Over-extraction of groundwater during the dry season may lower groundwater levels in some places, potentially jeopardising the health of groundwater dependent ecosystems.	For this reason, it is important to concentrate the roadworks to the early periods in the dry when water demand will be less, and water supplies more. In general, an average wet season will replenish aquifers, waterholes, and creeks. Utilise construction water bores with a sustainable yield and monitor flow rates. Cease use if flow rate drops 20%.	**3 - Moderate**	**1 – Rare**	**3 - Low**	Contractors will adhere to Section 21 - 24 of the DIPL Standard Specification for Environmental Management ver 2.0	**3 - Moderate**	**1 – Rare**	**3 - Low**
2.2.1		2.2 Inland water environmental quality	Protect the quality of groundwater and surface water so that environmental values inclduing ecological health, land uses and the welfare and amenity of people are maintained.	2.2.1 Decline in water quality as a result of accidental releases of hydrocarbon or other hazardous chemicals enter adjacent waterways.	2.2.1.1 Decline in the health of inland environmental water quality as a result declined water quality.	All control measures listed in 1.2.3.1 will be employed with the addition of the below: Discharge of chemical, fuel or lubricant, or any waste material or imported fill near or into waterways will be strictly prohibited Chemical and other dangerous goods storge areas will be located greater than 50 metres of natural or built drainage lines, flood prone areas, or on slopes steeper than 1:10. Temporary bunding will be applied when refuelling or maintaining plant and equipment, mix cutting oil with bitumen, or any other activity which may result in the spillage of a chemical, fuel or lubricant on any location with direct drainage to a waterway or environmentally sensitive area. Any water discharged from bunded areas will comply with applicable legislation and if required be appropriately treated prior to discharge. Liquid paint materials or other hazardous materials will not be disposed of by flushing down any sewer, stormwater system or natural waterway. Records of all water quality checks, discharges and any remedial actions will be kept. All chemical spills will be reported to the Superintendent. Where appropriate, spills will also be reported to the NT Pollution Hotline, phone 1800 064 567.	**3 - Moderate**	**1 – Rare**	**3 - Low**	Contractors will adhere to Section 19 and 33 of the DIPL Standard Specification for Environmental Management ver 2.0	**3 - Moderate**	**1 – Rare**	**3 - Low**
2.2.2				2.2.2 the creation of gravel pits during construction results in impacts to groundwater flows and water quality.	2.2.2.1 Loss of habitat and declined health of native flora and fauna.	An Erosion and Sediment Control Plan (ESCP) will be developed and implemented during construction and decommissioning Effective precautions will be taken to prevent erosion of soil from all lands used or occupied by the Contractor. Erosion and sediment control measures will comply with the following requirements: a.) Early installation of all drainage erosion and sediment control measures. b.) Control measures will be in place prior to the commencement of works c.) All erosion and sediment control measures are to be installed and maintained in good working order. d.) Any runoff from the site will comply with the requirements of the DENR Guidelines and relevant legislation. e.) Contractor daily site inspections will consist of visual assessment of erosion and sediment control structures to verify their condition and effectiveness. Records of inspections will be kept and made available upon request. f.) Control measure will be inspected throughout the duration of works and particularly following each rain event. g.) Control measures will be rearrange and reposition as required to maintain their efficiency. h.) Sediment collected by control measures will be handled and disposed of in a manner approved by the Superintendent. i.) All temporary control measures will be removed following rehabilitation or when otherwise no longer required.	**3 - Moderate**	**1 – Rare**	**3 - Low**	Contractors will adhere to Section 19 and 24 of the DIPL Standard Specification for Environmental Management ver 2.0	**3 - Moderate**	**1 – Rare**	**3 - Low**
2.2.3				2.2.3 Vegetation clearing and disturbance of the project area leads to exposed soils and sedimentation of waterways.	2.2.3.1 Exposed soils are destablilised and eroded by water. This causes sedimentation in waterways. Whilst the soils in the project area are predominantly vertosols (which are unlikely to erode given its high clay content and low position in the landscape) sheet erosion can occur when groundcover is removed.	An Erosion and Sediment Control Plan (ESCP) will be developed and implemented during construction and decommissioning.	**3 - Moderate**	**1 – Rare**	**3 - Low**	Contractors will adhere to Section 6, 19, 21 and 26 of the DIPL Standard Specification for Environmental Management ver 2.0	**3 - Moderate**	**1 – Rare**	**3 - Low**
2.2.4				2.2.4 Construction of creek crossing leads to changes in water quality	2.2.4.1 Loss of habitat for native fauna and flora and decline in native fauna and flora health.	No creek crossings occur	**3 - Moderate**	**1 – Rare**	**3 - Low**	Contractors will adhere to Section 23 and 24 of the DIPL Standard Specification for Environmental Management ver 2.0	**3 - Moderate**	**1 – Rare**	**3 - Low**
2.2.5				2.2.5 Water diversion during construction leads to changes to water quality.	2.2.5.1 Loss of habitat for native fauna and flora and decline in native fauna and flora health.	No water diversion to occur	**3 - Moderate**	**1 – Rare**	**3 - Low**	Contractors will adhere to Section 23 and 24 of the DIPL Standard Specification for Environmental Management ver 2.0	**3 - Moderate**	**1 – Rare**	**3 - Low**
3. Air													

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							C	L	RR		C	L	RR
3.1.1	3. Air	3.1 Air quality	Protect the air quality and minimise emissions and their impact so that environmental values are maintained.	3.1.1 Air pollution as a result of dust generated by the movement of construction vehicles and equipment on unsealed roads.	3.1.1.1 Dust reduces visibility and impacts on road safety for both road users and construction personnel.	Earthwork formations, stockpiles and roads will be sprayed with water or other suitable liquids for dust suppression. Dust generating activities which cannot be adequately controlled by water or other means will be stopped until adequate controls can be put in place. All materials transported on and/or off site will be suitably covered and loaded in a manner that will prevent dropping of materials. Exhaust systems of construction plant, vehicles and machinery will be maintained in accordance with manufacturer's specification and undertaking periodic visual checks of exhaust systems' emissions. A Traffic Management Plan will be developed and implemented prior to the commencement of construction and decommissioning activities.	**2 - Minor**	**3 – Possible**	**6 - Medium**	Contractors will adhere to Section 30 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 1.13.3 of the Standard Specification for Roadworks ver 4.2.	**2 - Minor**	**2 – Unlikely**	**4 - Low**
3.1.2				3.1.2 Air pollution as a result of dust generated as a result of vegetation clearance and topsoil excavation.	3.1.2.1 Loss of habitat and decline in health of native fauna and flora.	Earthwork formations, stockpiles and roads will be sprayed with water or other suitable liquids for dust suppression. Dust generating activities which cannot be adequately controlled by water or other means will be stopped until adequate controls can be put in place. All materials transported on and/or off site will be suitably covered and loaded in a manner that will prevent dropping of materials. A Traffic Management Plan will be developed and implemented prior to the commencement of construction and decommissioning activities.	**2 - Minor**	**2 – Unlikely**	**4 - Low**	Contractors will adhere to Section 30 of the DIPL Standard Specification for Environmental Management ver 2.0	**2 - Minor**	**2 – Unlikely**	**4 - Low**
3.2.1		3.2 Atmospheric processes	Minimise greenhouse gas emissions so as to contribute to the NT governments aspirational target of achieving net zero greenhouse gas emissions by 2050.	3.2.1 Reduced visibility as a result of vehicle and equipment exhaust emissions.	3.2.1.1 Reduced visibility impacts on road safety for both road users and construction personnel.	A Traffic Management Plan will be developed and implemented prior to the commencement of construction and decommissioning activities. Exhaust systems of construction plant, vehicles and machinery will be maintained in accordance with manufacturer's specification and undertaking periodic visual checks of exhaust systems' emissions.	**2 - Minor**	**2 – Unlikely**	**4 - Low**	Contractors will adhere to Section 30 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 1.13.3 of the Standard Specification for Roadworks ver 4.2	**2 - Minor**	**2 – Unlikely**	**4 - Low**
3.2.2				3.2.2 Reduced visibility as a result of dust generated by the movement of vehicles and equipment.	3.2.2.1 Reduced visibility impacts on road safety for both road users and construction personnel.	A Traffic Management Plan will be developed and implemented prior to the commencement of construction and decommissioning activities. Exhaust systems of construction plant, vehicles and machinery will be maintained in accordance with manufacturer's specification and undertaking periodic visual checks of exhaust systems' emissions.	**2 - Minor**	**2 – Unlikely**	**4 - Low**	Contractors will adhere to Section 30 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 1.13.6 and 2.18.2 of the Standard Specification for Roadworks ver 4.2	**2 - Minor**	**2 – Unlikely**	**4 - Low**
4. People													
4.1.1		4.1 Communities and economy	Enhance communities and the economy and foster resilience to a changing climate, for the welfare, amenity and benefit of current and future generations of Territorians	4.1.1 Unexpected early termination of the Project due to delays, weather or other unexpected issues.	4.1.1.1 Project is not completed resulting in access issues and economic losses for the local community.	Works are undertaken during the dry season only 'Open communication with contractors is facilitated. Weather forecasts are monitoried and where possible works are scheduled or rescheduled around inclement weather. Road diversions are in place to maintain access.	**3 - Moderate**	**2 – Unlikely**	**6 - Medium**	Contractors will adhere to Section 2.6 of the Standard Specification for Roadworks ver 4.2	**3 - Moderate**	**1 – Rare**	**3 - Low**
4.1.2				4.1.2 Access and traffic flows to adjacent areas are restricted and/or delayed during construction.	4.1.2.1 Disruption to daily activities of local residents, landowners and users due to inability to gain access into and out of sites adjacent to the roadworks.	A Traffic Management Plan will be developed and implemented prior to the commencement of construction and decommissioning activities.	**2 - Minor**	**3 – Possible**	**6 - Medium**	Contractors will adhere to Section 29 of the DIPL Standard Specification for Environmental Management ver 2.0	**2 - Minor**	**2 – Unlikely**	**4 - Low**
4.1.3				4.1.3 Water supplies to communities are in short supply as a result of groundwater extraction and surface water extraction	4.1.3.1 Community health and wellbeing is affected as result of water supply shortages	Use of existing bores requires the permission of the current owner/user. Bores within 2km of existing community borefileds run by the PWC are strictly out of bounds unless special permission is granted	**3 - Moderate**	**1 – Rare**	**3 - Low**	Contractors will adhere to Section 23 of the DIPL Standard Specification for Environmental Management ver 2.0	**3 - Moderate**	**1 – Rare**	**3 - Low**
4.1.4				4.1.4 Bore pumping impacts water quality and water quality of community production bores	4.1.4.1 Local businesses and industries suffer financial loss as result of water supply shortages	Use of existing bores requires the permission of the current owner/user. Bores within 2km of existing community borefileds run by the PWC are strictly out of bounds unless special permission is granted	**3 - Moderate**	**1 – Rare**	**3 - Low**	Contractors will adhere to Section 23 and 24 of the DIPL Standard Specification for Environmental Management ver 2.0	**3 - Moderate**	**1 – Rare**	**3 - Low**

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							C	L	RR		C	L	RR
4.2.1		5.2 Culture and heritage	Protect sacred sites, culture and heritage.	4.2.1 Known indigenous cultural heritage sites are disturbed or damaged during road construction, operation and/or decommissioning.	4.2.1.1 Loss, disruption and/or damage of indigenous heritage.	Sites or areas which must be avoided or protected during works will be identified on a site map. The map will be made available to all relevant personnel during the works. Where practicable temporary protection fencing is installed and maintained around known or suspected indigenous cultural heritage sites. An AAPA Authority Certificate will be obtained and the following will be adhered to: - All works are confined to the 'subject' land identified on the certificate. - All activities conducted by the Contractor are covered in the 'Purpose of Use' on the certificate - All conditions on the certificate are adhered to. - All contractors, employees and sub-contractors are aware of the conditions of the certificate. - Should any item be encountered which might be an artefact of heritage value or any relic, artefact or material which might be of Aboriginal origin, cease all construction work that might affect the item and protect the item from damage or disturbance. Notify the Superintendent immediately, who will then arrange for appropriate specialists and community representatives to inspect the site. - Ensure that all personnel working on site have received training regarding their responsibilities regarding cultural heritage and are made aware of any sites/areas which must be avoided or protected including Sacred Sites identified on the AAPA Authority Certificates.	**4- Major**	**2 – Unlikely**	**8 - Medium**	'Contractors will adhere to Section 14 and 15 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 1.26 and 1.4.1 of the Standard Specification for Roadworks ver 4.2	**4- Major**	**2 – Unlikely**	**8 - Medium**
4.2.2				4.2.2 Unknown indigenous cultural heritage sites are disturbed or damaged during road construction, operation and/or decommissioning.	4.2.2.1 Loss of indigenous heritage.	Should any item be encountered which might be an artefact of heritage value or any relic, artefact or material which might be of Aboriginal or Torres Strait Islander origin, all construction work that might affect the item will cease and will protect the item from damage or disturbance. The Superintendent will be notified immediately, who will then arrange for appropriate specialists and community representatives to inspect the site.	**4- Major**	**3 – Possible**	**12 - High**	'Contractors will adhere to Section 14 and 15 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 1.26 and 1.4.1 of the Standard Specification for Roadworks ver 4.2	**4- Major**	**2 – Unlikely**	**8 - Medium**
4.3.1				4.3.1 Construction personnel are exposed to unexploded ordnance (UXO) during construction.	4.3.1.1 Human injury and/or fatality.	Should any item be encountered which might be a UXO, all construction work that might affect the item will cease and will protect the item from damage or disturbance. The Superintendent will be notified immediately, who will then contact police to arrange for appropriate specialists to inspect the site.	**4- Major**	**1 – Rare**	**4 - Low**	Contractors will follow Defence UXO policy on encountering any item	**4- Major**	**1 – Rare**	**4 - Low**
4.3.2				5.3.2 Noise generated during construction and decommissioning impacts on the physical and mental health of adjacent land users.	5.3.2.1 Impacts to mental and/or physical health of nearby land users and construction personnel.	A Traffic Management Plan will be developed and implemented prior to the commencement of construction and decommissioning activities. Access will be maintained to properties throughout construction.	**3 - Moderate**	**2 – Unlikely**	**6 - Medium**	Contractors will adhere to Section 4, 30 and 31 of the DIPL Standard Specification for Environmental Management ver 2.0	**3 - Moderate**	**1 – Rare**	**3 - Low**
4.3.3	5. People			5.3.3 Dust generated during construction and decommissioning causes physical and mental health impacts to adjacent land users.	5.3.3.1 Impacts to mental and/or physical health of nearby land users and construction personnel.	Earthwork formations, stockpiles and roads will be sprayed with water or other suitable liquids for dust suppression. Dust generating activities which cannot be adequately controlled by water or other means will be stopped until adequate controls can be put in place. All materials transported on and/or off site will be suitably covered and loaded in a manner that will prevent dropping of materials. A Traffic Management Plan will be developed and implemented prior to the commencement of construction and decommissioning activities. Where applicable the following measures will be applied to minimise the impact of noise: a.) Substitution by an alternative process. b.) Restricting times when work is carried out c.) Screening or enclosures.	**3 - Moderate**	**2 – Unlikely**	**6 - Medium**	Contractors will adhere to Section 4, 30 and 31 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 2.18.2 of the Standard Specification for Roadworks ver 4.2	**3 - Moderate**	**1 – Rare**	**3 - Low**
4.3.4				5.3.4 Increased numbers of mosquitos and biting insects (as a result of new breeding habitats water ponds created during construction and decommission activities) impacts on the mental and physical health of adjacent land users and construction site personnel.	5.3.4.1 Impacts to mental and/or physical health of nearby land users and construction personnel.	At the completion of construction and decommissioning, all areas where ponding of water is likely will be altered to ensure they are free draining.	**3 - Moderate**	**2 – Unlikely**	**6 - Medium**	Contractors will adhere to Section 28 of the DIPL Standard Specification for Environmental Management ver 2.0	**3 - Moderate**	**1 – Rare**	**3 - Low**
4.3.5		5.3 Human health	Protect the health of the Northern Territory	4.3.5 On-site accidental fires cause risk to health and safety of adjacent land users and on-site personnel.	4.3.5.1 Fire leads to loss of vegetation and loss of habitat for fauna. It is also poses safety hazard for construction personnel and nearby land users.	Lighting of fires for clearing of vegetation or disposal of rubbish will not be permitted under any circumstances. When fires are accidentally started, these will be extinguished immediately if appropriate and safe to do.	**3 - Moderate**	**1 – Rare**	**3 - Low**	Contractors will adhere to Section 18 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 3.1 of the Standard Specification for Roadworks ver 4.2	**3 - Moderate**	**1 – Rare**	**3 - Low**

ID	THEME	ENVIRON-MENTAL FACTOR	Environmental Objective	POTENTIAL IMPACT (How the Project interacts with assets, values, uses and location. Include clear description of the cause)	CONSEQUENCE (Clearly understand what is the final impact. Describe whether it is construction, operation or decommissioning)	EXISTING CONTROL MEASURES	INITIAL RISK RATING			ADDITIONAL CONTROL MEASURES	RESIDUAL RISK RATING		
							C	L	RR		C	L	RR
4.3.6			population.	4.3.6 Compromised public access to on-site hazardous materials results in physical and mental health impacts on site visitors (authorised and unauthorised), construction personnel and adjacent land users.	4.3.6.1 Unauthorised access to fuel leading to health impacts.	Appropriate storage of hazardous material will be implemented. Site fencing and security will be implemented and monitored during construction and decommissioning.	**3 - Moderate**	**1 – Rare**	**3 - Low**	Contractors will adhere to Section 5 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 1.7 and 22.6.1 of the Standard Specification for Roadworks ver 4.2	**3 - Moderate**	**1 – Rare**	**3 - Low**
4.3.7				4.3.7 Impeded access for emergency services as a result of temporary road closures impacts the physical and mental health of site personnel and adjacent land users. Road closure or diversion.	4.3.7.1 Loss of life or further impact to human mental and physical health.	A Traffic Management Plan will be developed and implemented prior to the commencement of construction and decommissioning activities. Emergency management controls.	**4- Major**	**2 – Unlikely**	**8 - Medium**	Contractors will adhere to Section 5 and 29 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 22.7 of the Standard Specification for Roadworks ver 4.2	**4- Major**	**1 – Rare**	**4 - Low**
4.3.8				4.3.8 Unauthorised access during construction or decommission results in mental or physical injury to the perpetrator, site personnel or adjacent land users.	4.3.8.1 Human injury	Site fencing and security will be implemented and monitored during construction and decommissioning. The site will be locked up after completion of shifts as per the site protocols.	**3 - Moderate**	**1 – Rare**	**3 - Low**	Contractors will adhere to Section 5 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 2.22 of the Standard Specification for Roadworks ver 4.2	**3 - Moderate**	**1 – Rare**	**3 - Low**
4.3.9				4.3.9 Accidental damage to utilities or services during construction or decommissioning results in physical or mental injury to site personnel or adjacent land users.	4.3.9.1 Human injury or fatality.	Service utilities locations will be identified and communcated to contractors. Protection measures put in place to ensure services are not damaged.	**4- Major**	**2 – Unlikely**	**8 - Medium**	Contractors will adhere to Section 5 of the DIPL Standard Specification for Environmental Management ver 2.0. Contractors will adhere to Section 1.13.3 of the Standard Specification for Roadworks ver 4.2	**4- Major**	**1 – Rare**	**4 - Low**
4.3.10				4.3.10 Accidental damage to utilities during construction or decommissioning results in service delivery disruptions for adjacent land users.	4.3.10.1 Economic losses or inconvenience for local community.	Service utilities locations will be identified and communcated to contractors. Protection measures put in place to ensure services are not damaged.	**3 - Moderate**	**2 – Unlikely**	**6 - Medium**	Contractors will adhere to Section 1.13.3 of the Standard Specification for Roadworks ver 4.2	**3 - Moderate**	**1 – Rare**	**3 - Low**

15.2. Appendix B - AAPA Certificates

Daryl Browne

From: Dianne Bensley
Sent: Wednesday, 11 November 2020 11:18 AM
To: Daryl Browne
Subject: RE: Heritage matters Melville Island Roads

Hi Daryl,
I have conducted a search of my maps and databases for those areas on Melville Island undergoing road upgrades. It looks like there has never really been any archaeological surveys conducted of much of the Tiwi Islands. I can confirm that there are no declared heritage places located within the vicinity of any of the roadworks and there are also no previously recorded Aboriginal archaeological sites near any of the proposed roadworks.
Because the proposed roadworks are largely to be in the existing road corridors, I won't recommend that any archaeological surveys be conducted. I note however, that there are some areas that will require vegetation/land clearing, particularly the gravel pits and the bores. I will advise that the usual care be taken during those activities, and if any archaeological sites are discovered, then all works in the immediate vicinity cease and Heritage Branch contacted for comment.

Regards,
Di

Dianne Bensley
Senior
Heritage
Officer,
Heritage
Branch
Heritage,
Libraries
and Sport
Department of Territory Families, Housing and Communities

Floor 1, JHV2- Jape Home Maker
Village, 356 Bagot Road, Millner
GPO Box 1448, Darwin, NT 0801

t. 08 8999 5051
e. dianne.bensley@nt.gov.au
w. **nt.gov.au**

From: Daryl Browne <Daryl.Browne@nt.gov.au>
Sent: Tuesday, 10 November 2020 12:28 PM
To: Dianne Bensley <Dianne.Bensley@nt.gov.au>
Cc: Environment DIPL <Environment.DIPL@nt.gov.au>; Josefa Tchong <Josefa.Tchong@nt.gov.au>
Subject: Heritage matters Melville Island Roads

Hi Di

DIPL are proposing to increase safety and upgrade road conditions along Pickertaramoor, Pirlangimpi and Milikapiti Roads, Melville Island. You have previously responded to works along Paru Road.

The majority of the road construction for the roads is within the existing road formation, however there are a number of bends that have been identified that would require the curve to be realigned.

To allow the road upgrades to be undertaken grave lpits have been nominated along the length of the roads and future bore locations have been nominated. These will likely involve clearing for a dam/turkeys nest for filling purposes.

I have attached a zip file with shapefiles, kmz files and jpeg maps of the locations of the proposed realignments, gravel pits and water points.

Four Aboriginal Areas Protection Authority (AAPA) Certificates have been identified that cover the roadworks, water points and gravel pits.

Can you please conduct a search of Heritage and Cultural matters that may occur within the subject land associated with the proposal as shown on the attached map. Can you please provide advice as to whether you think an archaeological study would be required for these areas so we can plan for them in a referral to the NT EPA if necessary.

If you need any further information please call.

Regards

Daryl Browne
A/Manager Projects
Engineering and Environment Services
Department of Infrastructure, Planning and Logistics
Northern Territory Government
Level 3, Highway House, Palmerston Circuit, Palmerston
PO Box 61, Palmerston, NT 0831

p ... 08 8999 4440
m ... 0417 749 364
e ... daryl.browne@nt.gov.au
w ... www.nt.gov.au

15.3. Appendix C – Landowner Permission

15.4. Appendix D – Department of Health Kitchen Approval

15.5. Appendix E – Department of Health Approval for Septic / Plumber Certification

15.6. Appendix F – Gravel Pit Management Plan

GRAVEL PIT MANAGEMENT PLAN

Road **[name of main road]**

Chainage **[chainage along main road of pit access road]**

Map

[include map showing pit and access road and labelled corners (corresponding coordinates to be provided in the table below)]

Coordinates *[decimal degrees]*

	Latitude	Longitude
1	-14.343504	129.839613
2	-14.363056	129.817169
3	-14.356434	129.813268
4	-14.348999	129.821856
5	-14.352348	129.828573
6	-14.343299	129.838573

Land Owner

[Provide details of the Land Owner. Details to include:

- *Owner Name*
- *Contact details*
- *Property name*
- *Details of any discussions held with the Land Owner*
- *Permissions to be attached as an Appendix (this can be an email, letter, etc)]*

Aboriginal Areas Protection Authority Certificates

[Details of any relevant AAPA Certificate and information regarding any Restricted Work Areas (RWAs), including mitigation measures to ensure the protection of any sacred site.

Relevant AAPA Certificates to be attached as Appendix.]

Pit Details

[Detail should include, but not be limited to:

- *Total gravel pit area (as outlined by the coordinates above)*
- *Number of extraction areas within the pit (current and planned) within the extraction area (including area and depth)*
- *Total area already disturbed*
- *Areas already rehabilitated/exhausted*
- *Location and estimate of volume of any stockpiles (current and planned) of vegetation, overburden, gravel, rock, etc*
- *Photographs]*
- *Quality of material? Have geotechnical surveys been undertaken.*

Environmental Risk Assessment

[An Environmental Risk Assessment should identify potential environmental risks and list management measures to reduce the risk.

The following is a list of things to consider when identifying environmental risks:

Operational Requirements

- *Does the site provide sufficient land area for present and future requirements?*
- *Is there easy access and transport networks of an appropriate standard?*
- *Does the site provide for safe truck entry and exit and on-site queuing of trucks?*

Topographic and Meteorological Assessment

- *Are the rainfall patterns or prevailing wind directions likely to cause management difficulties?*
- *Are the local climatic conditions in combination with the topography likely to result in impacts on road users and/or the nearest residents? IE. Dust.*

Water Issues

- *Are there any site constraints which make on-site water management difficult?*

- *Are there risks of surface water pollution because of the proximity or pathways to waterbodies? Can any required separation distances from waterbodies under any existing legislation or guidelines be complied with? IE. NT Land Clearing Guidelines.*
- *Are there risks of groundwater pollution because of shallow or rising groundwater tables, or proximity to groundwater recharge areas, or areas with a high vulnerability to pollution? (This will require consultation with the Department of Environment and Natural Resources)*
- *Is the site susceptible to flooding?*

Flora and Fauna Issues

- *Can clearing of natural vegetation be avoided?*
- *Can clearing of vegetation of high significance be avoided e.g. vegetation used for visual screening, riparian vegetation, vegetation used as corridors for the movement of fauna?*
- *Are threatened flora or fauna species, populations and ecological communities or their habitats likely to be affected?*
- *Are there any Declared Weeds or Weeds of National Significance on the site?*

Geological or Soil Issues

- *Are there any topographic or geological characteristics which will cause difficulties in managing impacts (subsidence, slippage, seismic)?*
- *Are the soils highly erodible? Identify any potential sediment management problems?*
- *Are there existing soils problems e.g. contaminated soils, acid sulfate or saline soils?*

Transport Issues

- *Can truck traffic avoid residential areas, hospitals, schools and commercial areas?*
- *If inadequacies exist, can the road network or traffic management be changed to minimise any impacts particularly on residential areas?*

Community Issues

- *Is the proposal likely to be compatible with surrounding existing or proposed land uses, particularly any residential, special uses (such as schools, hospitals, community buildings) and any sites of outstanding natural or environmental value?*
- *Is there likely to be a problem in meeting sustained compliance with dust, noise or water quality requirements due to the proximity and nature of nearby land uses?*
- *Is the proposal likely to pose health risks?*
- *Is the proposal likely to affect the heritage significance of any Aboriginal or non-Aboriginal heritage items found or likely to be found on the site? Is the site highly visible? Will there be significant visual impacts?*

Cumulative Issues

- *Is the proposal at this site likely to contribute to any existing cumulative problems?]*

Pit Management

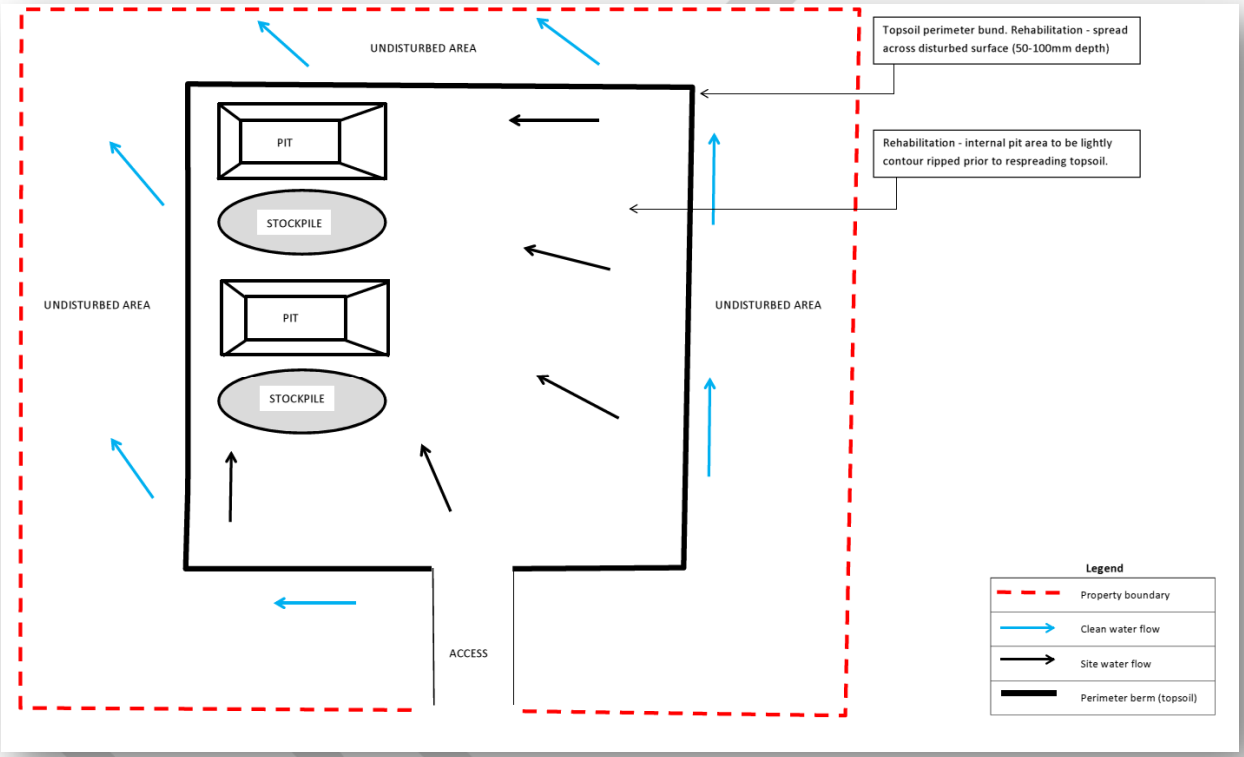
[Detail on how the Contractor will manage the extraction of material from the pit (ie working one area at a time, stockpiling topsoil, material for works and overburden/unsuitable material, progressive clearing/rehabilitation, retaining 25m vegetated buffers between open areas, etc]

Identify laydown areas, workers camp (if required), storage of chemicals, fuel, dangerous goods, etc

Erosion and Sediment Control Plan

[Provide and Erosion and Sediment Control Plan (ESCP) for the gravel pit. The level of detail required in the ESCP will reflect the level of risk the area represents. An ESCP should contain as a minimum:

- *Map of area showing pit and surrounding area, drainage lines, flow directions, location of roads/tracks, extraction areas, stockpiles and any other infrastructure, and location of erosion and sediment controls – Basic example below*
- *Standard drawings showing construction information for the erosion and sediment controls*[1]
- *Notes on construction, monitoring and maintenance of erosion and sediment controls.]*

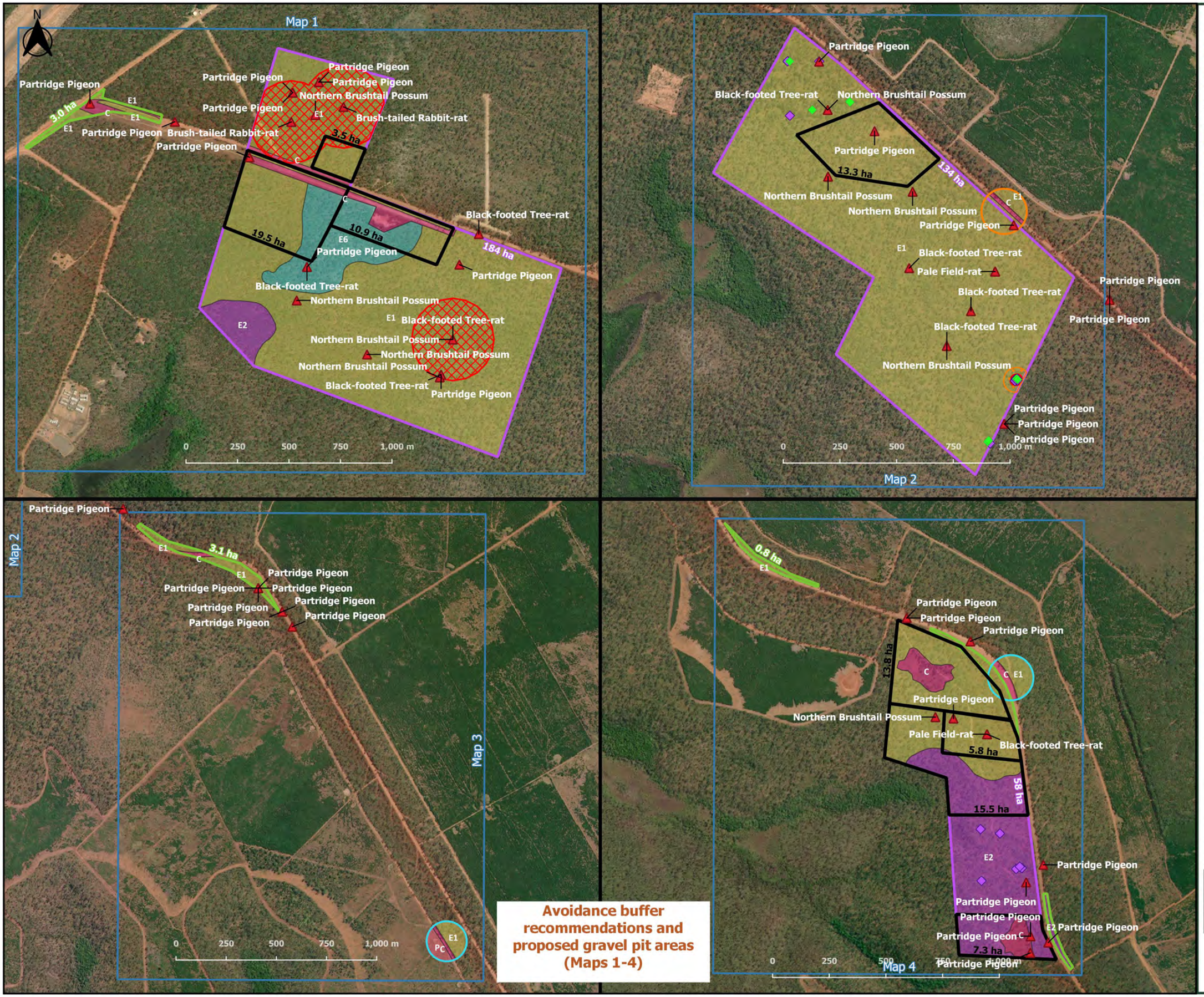


Pit Rehabilitation Plan

[Details on how and when areas within the gravel pit will be rehabilitated. IE, ripping along contours, spreading topsoil to 100mm, spread clear vegetation across disturbed surfaces. (Refer to our rehab notes in the ERAs)]

[1] Refer https://www.austieca.com.au/publications/book-6-standard-drawings

15.7. Appendix G – Biodiversity avoidance areas


Map 1
Partridge Pigeon
Brush-tailed Rabbit-rat
3.0 ha
E1
C
3.5 ha
Northern Brushtail Possum
Black-footed Tree-rat
19.5 ha
10.9 ha
E6
184 ha
E2
Pale Field-rat
0
250
500
750
1,000 m
Map 2
13.3 ha
134 ha
Map 3
3.1 ha
Map 4
0.8 ha
13.8 ha
5.8 ha
58 ha
15.5 ha
7.3 ha
Pc
Avoidance buffer recommendations and proposed gravel pit areas (Maps 1-4)
Key
Level 1 avoidance recommendations
Level 2 avoidance recommendations
Map areas
Proposed gravel pit area
Potential gravel pit survey areas
Existing bores 100 m buffer
Water points 100 m buffer
Road realignment
Threatened fauna detections
Typhonium jonesii
Typhonium mirabile
Vegetation communities
E1 - E. miniata, E. tetrodonta, C. nesophila tall open forest
E2 - C. nesophila, E. miniata tall open forest (on edge of plateau)
E3 - E. tetrodonta and E. miniata mid sparse to open woodland
E4 - E. miniata, E. tetrodonta tall open forest
E5 - C. nesophila, E. miniata tall open forest (plateau lower footslopes
E6 - E. miniata, C. nesophila, C. latifolia mid open forest
E7a - C. bleeseri, C. nesophila mid woodland
E7b - E. miniata, C. bleeseri mid woodland
W1a - Pandanus spiralis mid sparse shrubland
W1b - Grevillea pteridifolia low isolated tree over Sorghum spp. tall closed tussock grassland
W2a - Melaleuca viridiflora and / or M. nervosa low open forest
W2b - Lophostemon lactifluus, Melaleuca viridiflora, Buchanania obovata low woodland
W2c - Melaleuca viridiflora +/- M. nervosa, Grevillea pteridifolia low open woodland
W2d - Grevillea pteridifolia, G. heliosperma, Planchonia careya low open woodland
W3a - Corymbia porrecta, Melaleuca nervosa +/- M. viridiflora, Grevillea pteridifolia low open woodland
C - cleared
Background - ESRI Satellite
Project Name: Tiwi Islands Biodiversity Surveys (2020-030)
Client: GHD
Date: 19 October 2021
Datum: WGS84
CONNECT environmental

Map 5

Partridge Pigeon
E1
C
E1
Partridge Pigeon
Partridge Pigeon
C
E1
E1
0 250 500 750 1,000 m

Map 6

1.8 ha
Partridge Pigeon
Partridge Pigeon
E2
Partridge Pigeon
1.1 ha
W1a
W1a
W2c
111 ha
W2c
W2a
W2c
W3a
W2c
Black-footed Tree-rat
Pale Field-rat
C
Merten's Water Monitor
W2a
C
W2b
W2c
19.1 ha
Black-footed Tree-rat
Partridge Pigeon
Partridge Pigeon
Partridge Pigeon
E5
Partridge Pigeon
W2c
0 250 500 750 1,000 m

Map 7

E1
E1
C
E1
0 250 500 750 1,000

Map 8

1.1 ha
E4
C
5.3 ha
57 ha
7.6 ha
Northern Brushtail Possum
E2
Black-footed Tree-rat
7.9 ha
Partridge Pigeon
4.6 ha
C
7.7 ha
0 250 500 750 1,000 m

Avoidance buffer recommendations and proposed gravel pit areas (Maps 5-8)

Key

- Level 1 avoidance recommendations
- Level 2 avoidance recommendations
- Map areas
- Potential gravel pit survey area
- Proposed gravel pit area
- Existing bores 100 m buffer
- Water points 100 m buffer
- Road realignment
- Typhonium jonesii
- Typhonium mirabile

Vegetation communities

- E1 - E. miniata, E. tetrodonta, C. nesophila tall open forest
- E2 - C. nesophila, E. miniata tall open forest (on edge of plateau)
- E3 - E. tetrodonta and E. miniata mid sparse to open woodland
- E4 - E. miniata, E. tetrodonta tall open forest
- E5 - C. nesophila, E. miniata tall open forest (plateau lower footslopes
- E6 - E. miniata, C. nesophila, C. latifolia mid open forest
- E7a - C. bleeseri, C. nesophila mid woodland
- E7b - E. miniata, C. bleeseri mid woodland
- W1a - Pandanus spiralis mid sparse shrubland
- W1b - Grevillea pteridifolia low isolated tree over Sorghum spp. tall closed tussock grassland
- W2a - Melaleuca viridiflora and / or M. nervosa low open forest
- W2b - Lophostemon lactifluus, Melaleuca viridiflora, Buchanania obovata low woodland
- W2c - Melaleuca viridiflora +/- M. nervosa, Grevillea pteridifolia low open woodland
- W2d - Grevillea pteridifolia, G. heliosperma, Planchonia careya low open woodland
- W3a - Corymbia porrecta, Melaleuca nervosa +/- M. viridiflora, Grevillea pteridifolia low open woodland
- C - cleared
- P - Plantation

Background - ESRI Satellite

Project Name: Tiwi Islands Biodiversity Surveys (2020-030)
Client: GHD
Date: 30 June 2021
Datum: WGS84

CONNECT environmental

Map 9

Yellow ochre site

E4

Pirlangimpi Road

C

Pale Field-rat

E5

E4

Northern Brushtail Possum

E3

129 ha

E5

Northern Brushtail Possum

Brush-tailed Phascogale

Northern Brush-tailed Phascogale

Partridge Pigeon (eastern)

E4

Partridge Pigeon

Northern Brushtail Possum

Northern Brushtail Possum

E3

E2

C

E2

CH 42000

Pirlangimpi Road

11 ha

Northern Brushtail Possum

Pale Field-rat

E2

E3

E4

C

Masked Owl

E3

E2

0 250 500 750 1,000 m

Map 10

Pickertaramoor Road

C

E1

E1

Masked Owl

Masked Owl (Tiwi)

Masked Owl (Tiwi)

0 250 500 750 1,000 m

N

Map 11

E2

8.9 ha

116 ha

C

E2

E2

E3

E3

E4

E4

Pickertaramoor Road

Partridge Pigeon

C

E3

9.8 ha

E2

E3

CH 8500

E4

E3

E2

Northern Brushtail Possum

E5

E4

Northern Brushtail Possum

Northern Brushtail Possum

Northern Brushtail Possum

Partridge Pigeon

E5

0 250 500 750 1,000 m

Map 12

E1

E1 C

E1

E1

E1

C

Ch 12000

Pickertaramoor Road

Map 12

E1

E1

C

E1

Pickertaramoor Road

E1

CH 14000

P

P

n Brushtail Possum

E3

E2

Brush-tailed Phascogale

il Possum

Brushtail Possum

Partridge Pigeon

Northern Brushtail Possum

W1a

E4

E1

C

148 ha

16 ha

C

Northern Brushtail Possum

E2

0 250 500 750 1,000 m

Avoidance buffer recommendations and proposed gravel pit areas (Maps 9-12)

Key

- Level 1 avoidance recommendations
- Level 2 avoidance recommendations
- Threatened fauna detections (this survey)
- Threatened fauna - existing records (NT Fauna Atlas)
- Map areas
- Proposed gravel pit area
- Potential gravel pit survey area
- Existing bores 100 m buffer
- Water points 100 m buffer
- Road realignment

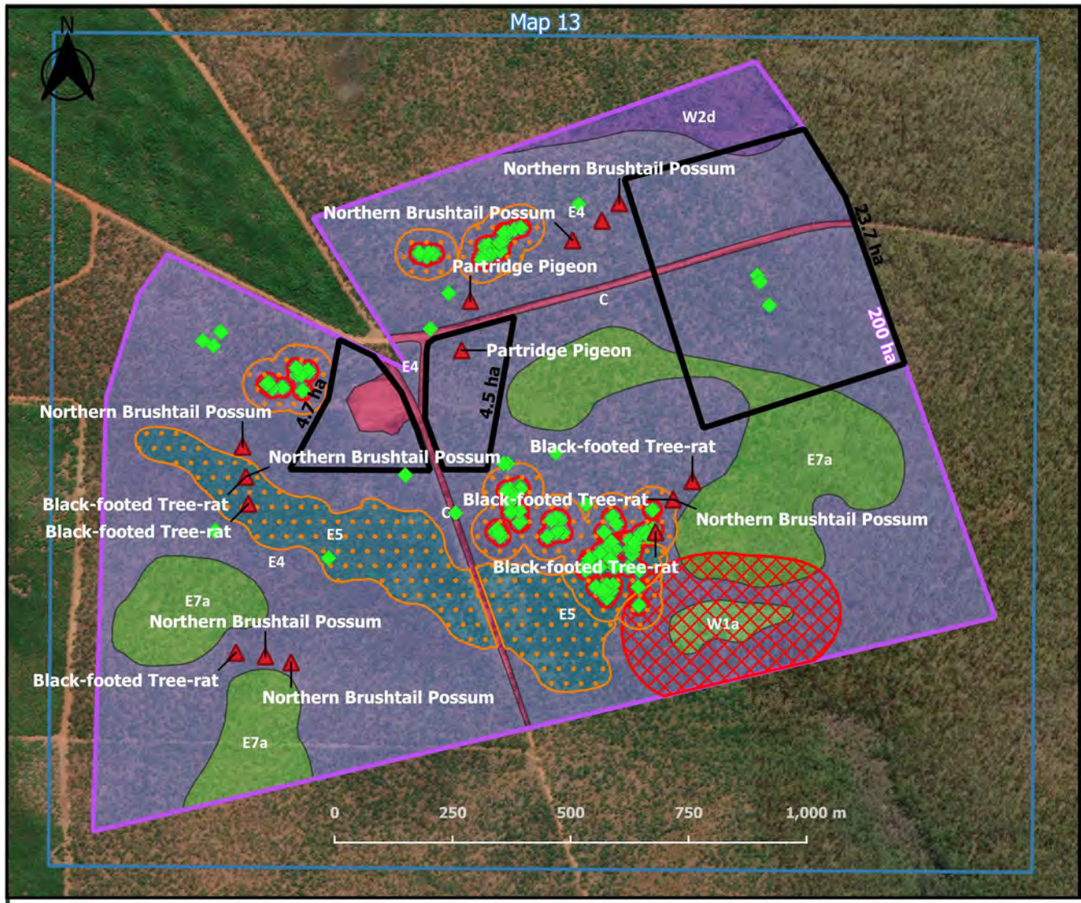
Vegetation communities

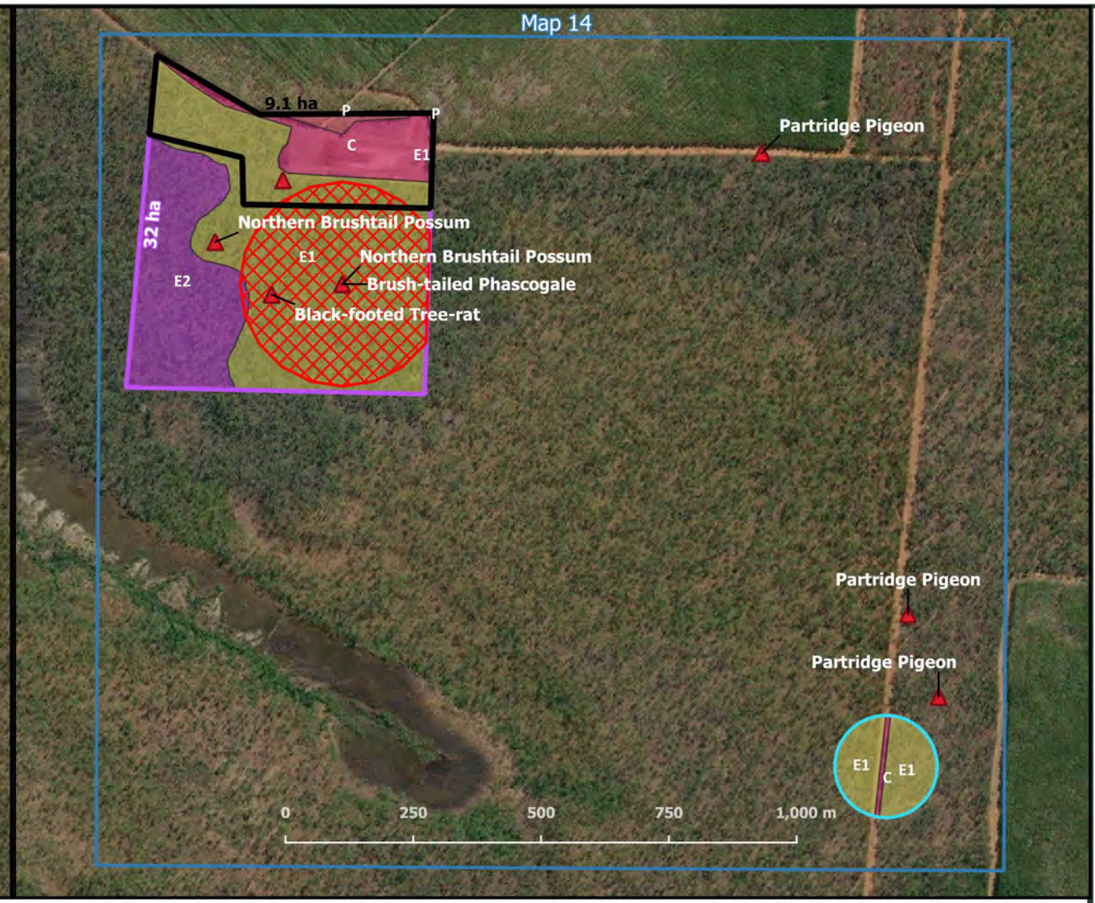
- E1 - E. miniata, E. tetrodonta, C. nesophila tall open forest
- E2 - C. nesophila, E. miniata tall open forest (on edge of plateau)
- E3 - E. tetrodonta and E. miniata mid sparse to open woodland
- E4 - E. miniata, E. tetrodonta tall open forest
- E5 - C. nesophila, E. miniata tall open forest (plateau lower footslopes
- E6 - E. miniata, C. nesophila, C. latifolia mid open forest
- E7a - C. bleeseri, C. nesophila mid woodland
- E7b - E. miniata, C. bleeseri mid woodland
- W1a - Pandanus spiralis mid sparse shrubland
- W1b - Grevillea pteridifolia low isolated tree over Sorghum spp. tall closed tussock grassland
- W2a - Melaleuca viridiflora and / or M. nervosa low open forest
- W2b - Lophostemon lactifluus, Melaleuca viridiflora, Buchanania obovata low woodland
- W2c - Melaleuca viridiflora +/- M. nervosa, Grevillea pteridifolia low open woodland
- W2d - Grevillea pteridifolia, G. heliosperma, Planchonia careya low open woodland
- W3a - Corymbia porrecta, Melaleuca nervosa +/- M. viridiflora, Grevillea pteridifolia low open woodland
- C - cleared
- P - Plantation

Background - ESRI Satellite

Project Name: Tiwi Islands Biodiversity Surveys (2020-030)
Client: GHD
Date: 19 February 2022
Datum: WGS84

CONNECT environmental





Key

- Level 1 avoidance recommendations
- Level 2 avoidance recommendations
- Map areas
- Potential gravel pit survey area
- Proposed gravel pit area
- Existing bores 100 m buffer
- Water points 100 m buffer
- Road realignment
- Typhonium jonesii
- Typhonium mirabile

Vegetation communities

- E1 - E. miniata, E. tetrodonta, C. nesophila tall open forest
- E2 - C. nesophila, E. miniata tall open forest (on edge of plateau)
- E3 - E. tetrodonta and E. miniata mid sparse to open woodland
- E4 - E. miniata, E. tetrodonta tall open forest
- E5 - C. nesophila, E. miniata tall open forest (plateau lower footslope
- E6 - E. miniata, C. nesophila, C. latifolia mid open forest
- E7a - C. bleeseri, C. nesophila mid woodland
- E7b - E. miniata, C. bleeseri mid woodland
- W1a - Pandanus spiralis mid sparse shrubland
- W1b - Grevillea pteridifolia low isolated tree over Sorghum spp. tall closed tussock grassland
- W2a - Melaleuca viridiflora and / or M. nervosa low open forest
- W2b - Lophostemon lactifluus, Melaleuca viridiflora, Buchanania obovata low woodland
- W2c - Melaleuca viridiflora +/- M. nervosa, Grevillea pteridifolia low open woodland
- W2d - Grevillea pteridifolia, G. heliosperma, Planchonia careya low open woodland
- W3a - Corymbia porrecta, Melaleuca nervosa +/- M. viridiflora, Grevillea pteridifolia low open woodland
- C - cleared
- P - Plantation

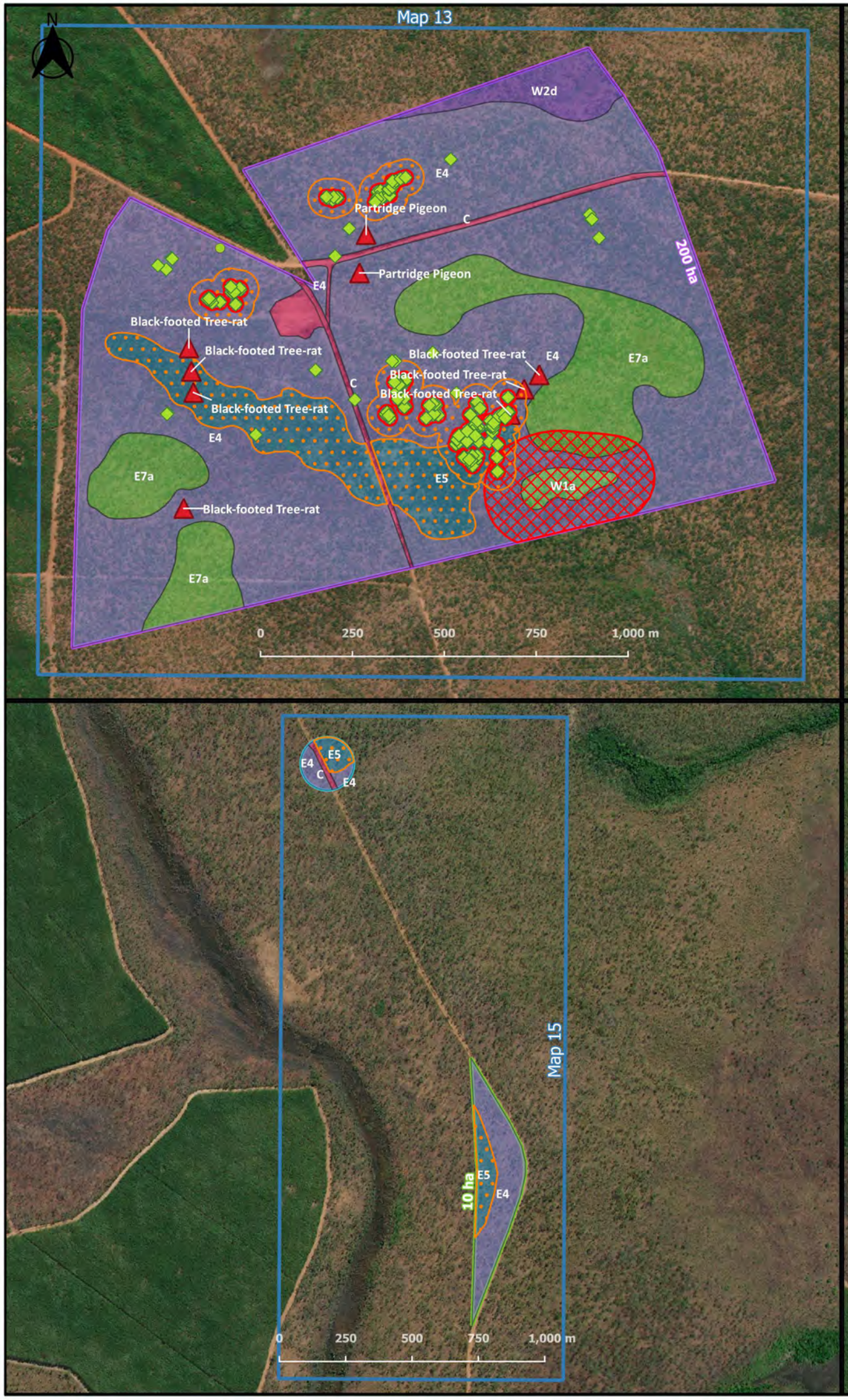
Background - ESRI Satellite

Project Name: Tiwi Islands Biodiversity Surveys (2020-030)
Client: GHD
Date: 19 October 2021
Datum: WGS84

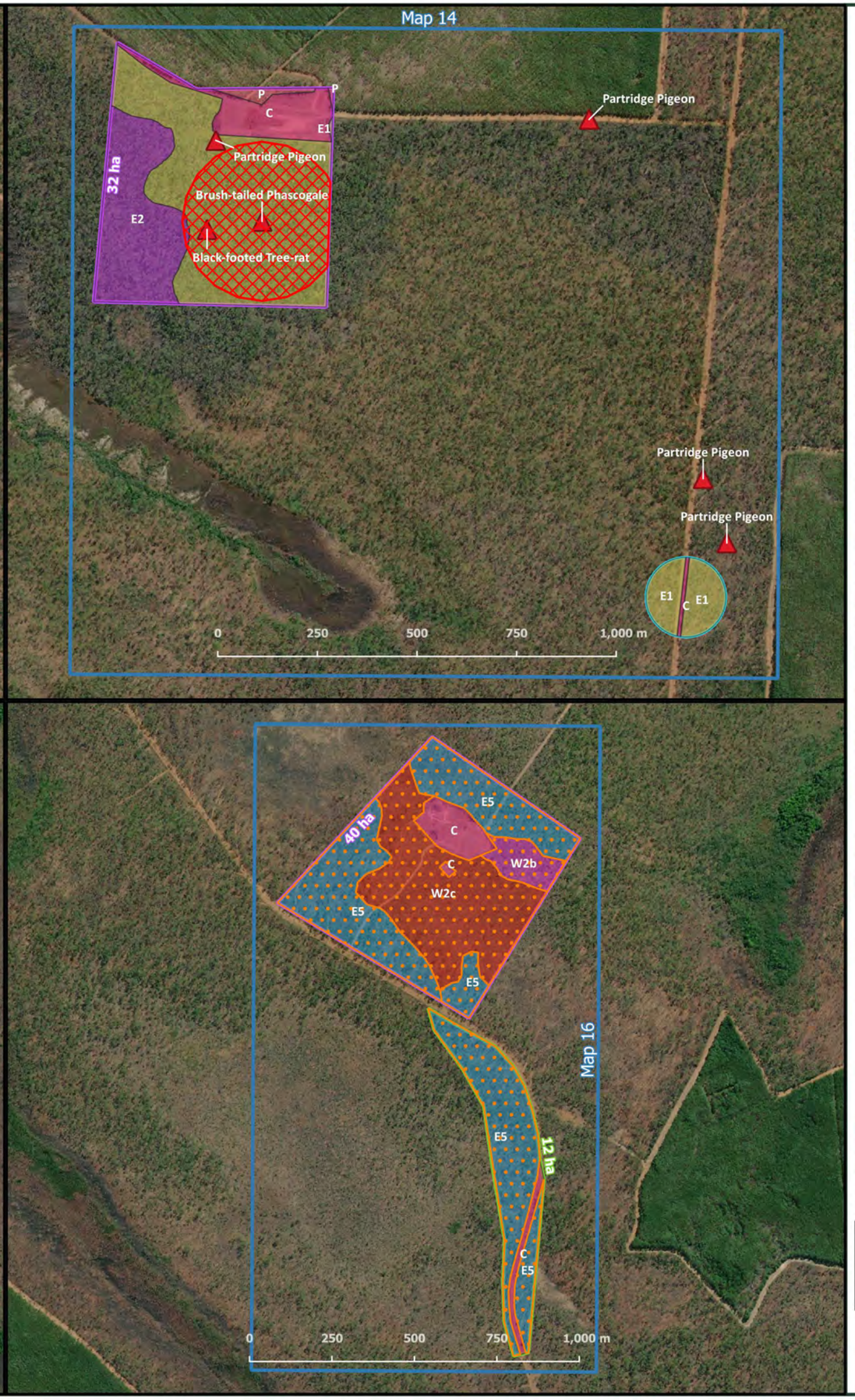
CONNECT environmental

Avoidance buffer recommendations and proposed gravel pit areas (Maps 13-14)

Map 13



Map 14



Map 15

Map 16

Avoidance buffer recommendations (Maps 13-16)

Key

- Level 1 avoidance recommendations
- Level 2 avoidance recommendations
- Map areas
- Existing bores 100 m buffer
- Water points 100 m buffer
- Gravel extraction area
- Road realignment

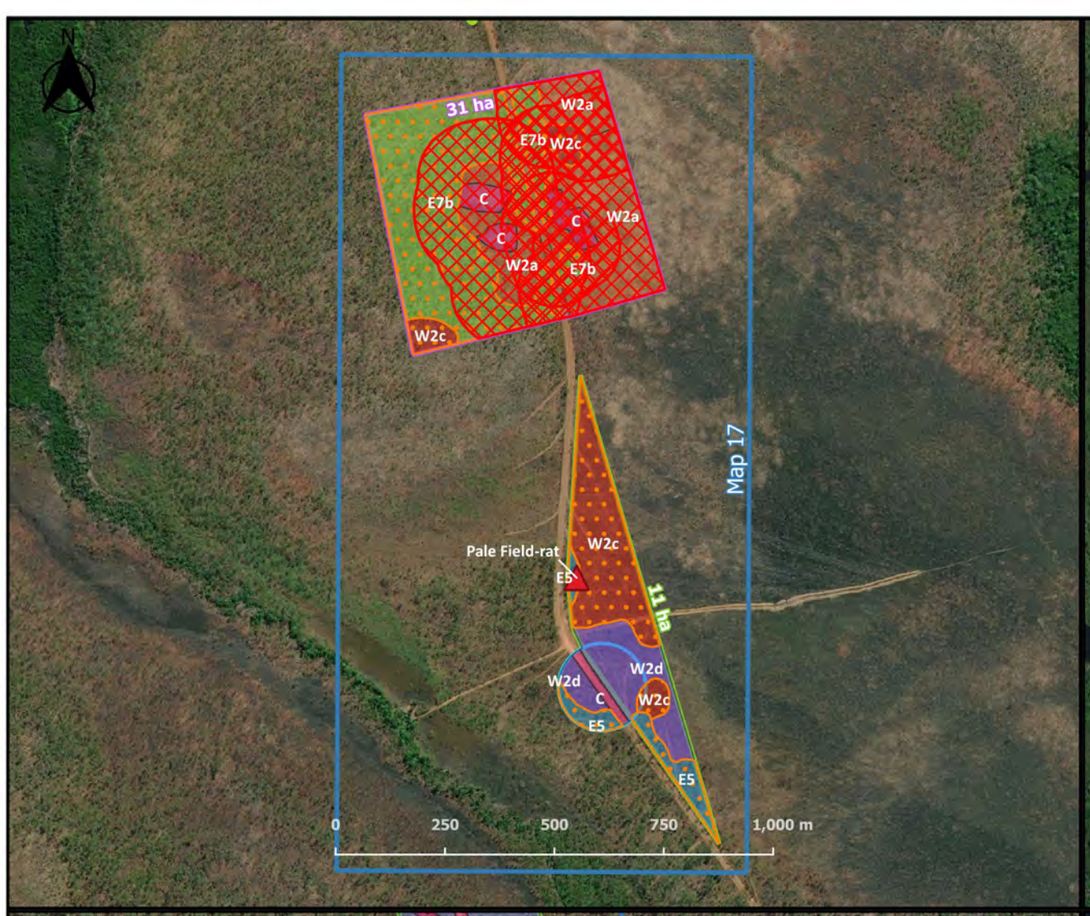
Vegetation communities

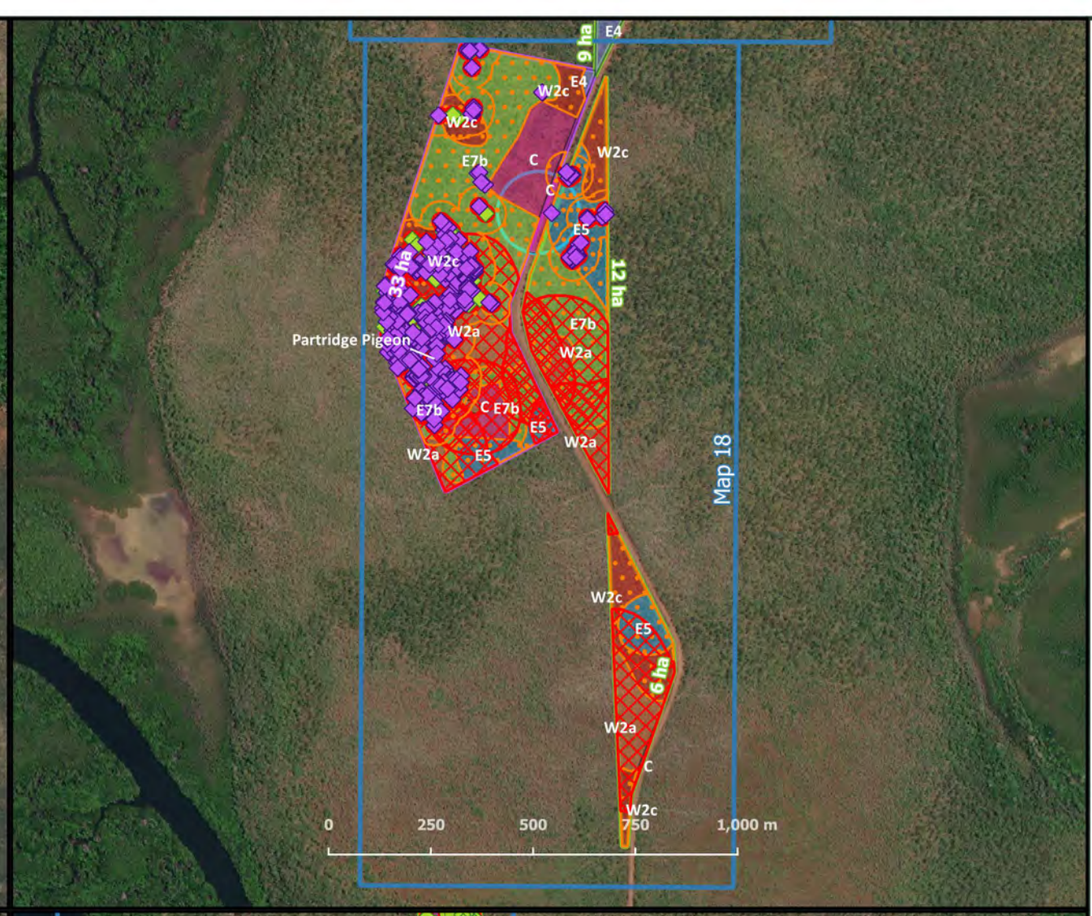
- E1 - E. miniata, E. tetrodonta, C. nesophila tall open forest
- E2 - C. nesophila, E. miniata tall open forest (on edge of plateau)
- E3 - E. tetrodonta and E. miniata mid sparse to open woodland
- E4 - E. miniata, E. tetrodonta tall open forest
- E5 - C. nesophila, E. miniata tall open forest (plateau lower footslopes
- E6 - E. miniata, C. nesophila, C. latifolia mid open forest
- E7a - C. bleeseri, C. nesophila mid woodland
- E7b - E. miniata, C. bleeseri mid woodland
- W1a - Pandanus spiralis mid sparse shrubland
- W1b - Grevillea pteridifolia low isolated tree over Sorghum spp. tall closed tussock grassland
- W2a - Melaleuca viridiflora and / or M. nervosa low open forest
- W2b - Lophostemon lactifluus, Melaleuca viridiflora, Buchanania obovata low woodland
- W2c - Melaleuca viridiflora +/- M. nervosa, Grevillea pteridifolia low open woodland
- W2d - Grevillea pteridifolia, G. heliosperma, Planchonia careya low open woodland
- W3a - Corymbia porrecta, Melaleuca nervosa +/- M. viridiflora, Grevillea pteridifolia low open woodland
- C - cleared
- P - Plantation

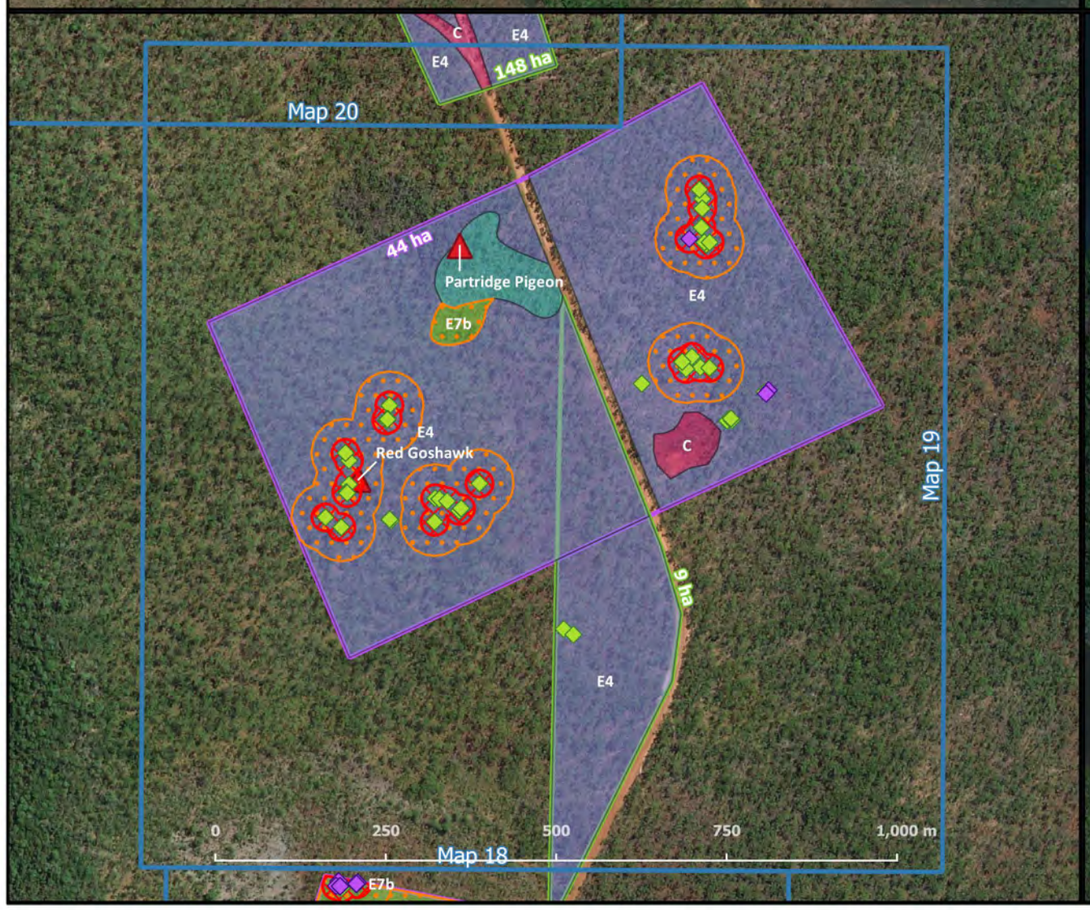
Background - ESRI Satellite

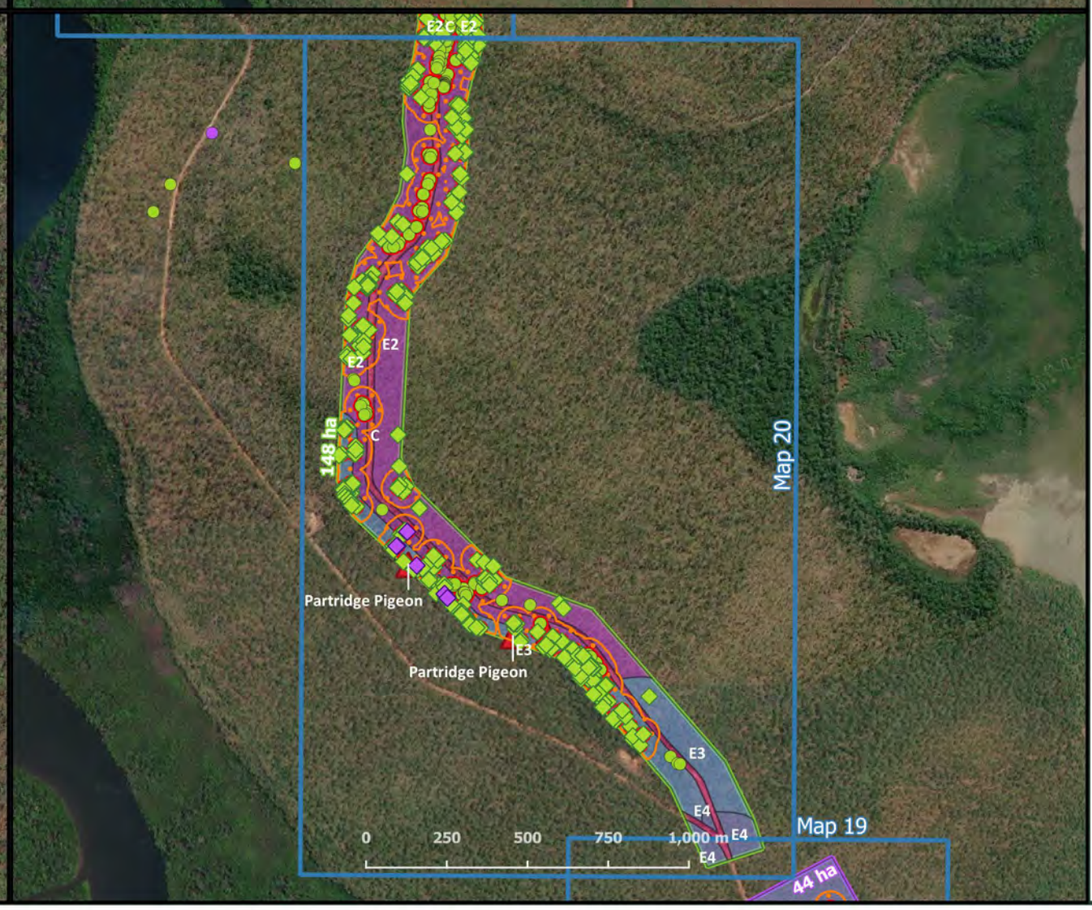
Project Name: Tiwi Islands Biodiversity Surveys (2020-030)
Client: GHD
Date: 30 June 2021
Datum: WGS84

CONNECT environmental









Avoidance buffer recommendations (Maps 17-20)

Key

- Level 1 avoidance recommendations
- Level 2 avoidance recommendations
- Map areas
- Existing bores 100 m buffer
- Water points 100 m buffer
- Gravel extraction area
- Road realignment

Vegetation communities

- E1 - E. miniata, E. tetrodonta, C. nesophila tall open forest
- E2 - C. nesophila, E. miniata tall open forest (on edge of plateau)
- E3 - E. tetrodonta and E. miniata mid sparse to open woodland
- E4 - E. miniata, E. tetrodonta tall open forest
- E5 - C. nesophila, E. miniata tall open forest (plateau lower footslope
- E6 - E. miniata, C. nesophila, C. latifolia mid open forest
- E7a - C. bleeseri, C. nesophila mid woodland
- E7b - E. miniata, C. bleeseri mid woodland
- W1a - Pandanus spiralis mid sparse shrubland
- W1b - Grevillea pteridifolia low isolated tree over Sorghum spp. tall closed tussock grassland
- W2a - Melaleuca viridiflora and / or M. nervosa low open forest
- W2b - Lophostemon lactifluus, Melaleuca viridiflora, Buchanania obovata low woodland
- W2c - Melaleuca viridiflora +/- M. nervosa, Grevillea pteridifolia low open woodland
- W2d - Grevillea pteridifolia, G. heliosperma, Planchonia careya low open woodland
- W3a - Corymbia porrecta, Melaleuca nervosa +/- M. viridiflora, Grevillea pteridifolia low open woodland
- C - cleared
- P - Plantation

Background - ESRI Satellite

Project Name: Tiwi Islands Biodiversity Surveys (2020-030)
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CONNECT environmental

Avoidance buffer recommendations (Maps 21-22)

Key

- Level 1 avoidance recommendations
- Level 2 avoidance recommendations
- Map areas
- Existing bores 100 m buffer
- Water points 100 m buffer
- Gravel extraction area
- Road realignment

Vegetation communities

- E1 - E. miniata, E. tetrodonta, C. nesophila tall open forest
- E2 - C. nesophila, E. miniata tall open forest (on edge of plateau)
- E3 - E. tetrodonta and E. miniata mid sparse to open woodland
- E4 - E. miniata, E. tetrodonta tall open forest
- E5 - C. nesophila, E. miniata tall open forest (plateau lower footslopes
- E6 - E. miniata, C. nesophila, C. latifolia mid open forest
- E7a - C. bleeseri, C. nesophila mid woodland
- E7b - E. miniata, C. bleeseri mid woodland
- W1a - Pandanus spiralis mid sparse shrubland
- W1b - Grevillea pteridifolia low isolated tree over Sorghum spp. tall closed tussock grassland
- W2a - Melaleuca viridiflora and / or M. nervosa low open forest
- W2b - Lophostemon lactifluus, Melaleuca viridiflora, Buchanania obovata low woodland
- W2c - Melaleuca viridiflora +/- M. nervosa, Grevillea pteridifolia low open woodland
- W2d - Grevillea pteridifolia, G. heliosperma, Planchonia careya low open woodland
- W3a - Corymbia porrecta, Melaleuca nervosa +/- M. viridiflora, Grevillea pteridifolia low open woodland
- C - cleared
- P - Plantation

Background - ESRI Satellite

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CONNECT environmental

Map 22
Map 21
Map 20
148 ha
Partridge Pigeon
Black-footed Tree-rat
0 250 500 750 1,000 m