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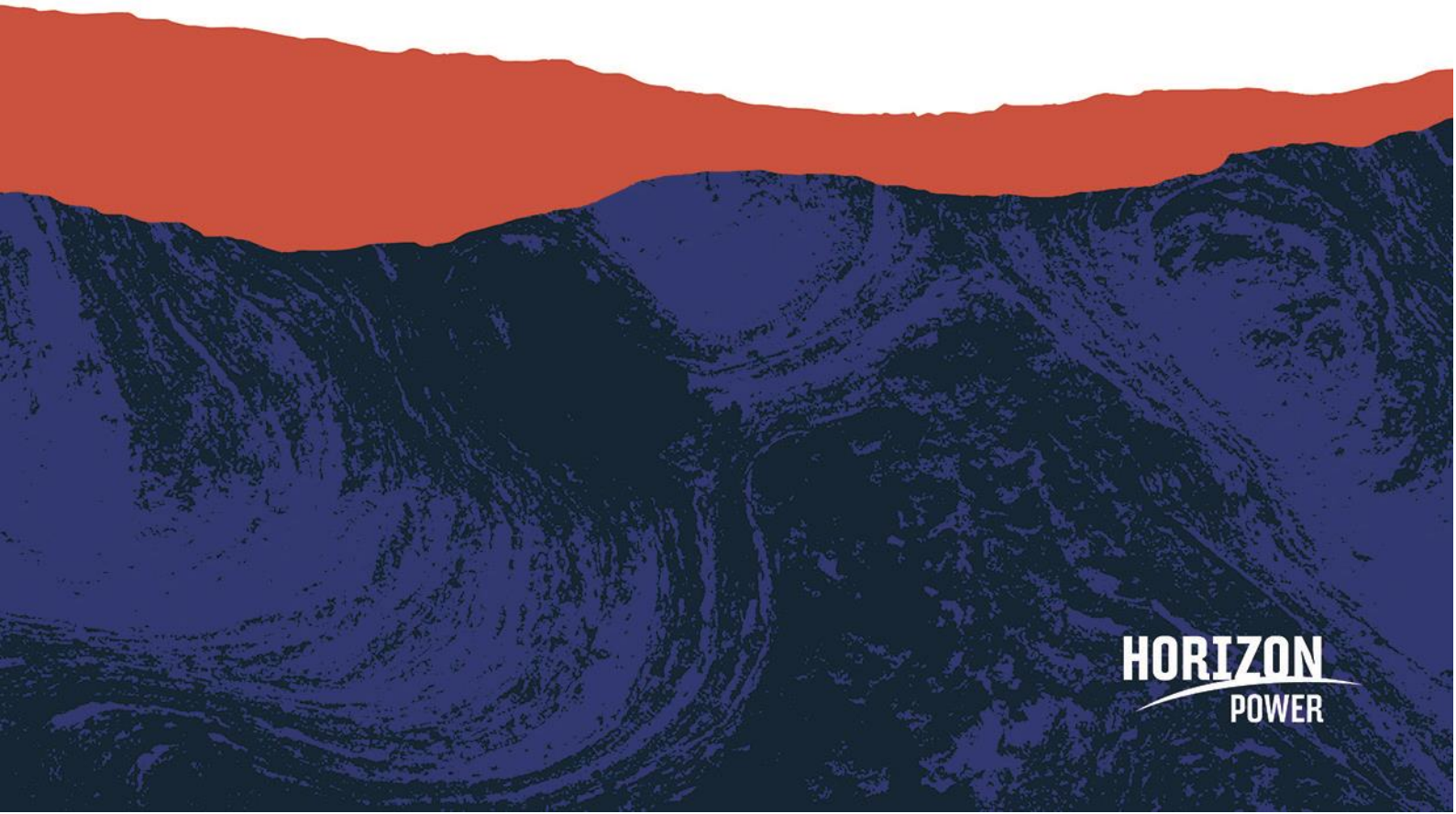
Burrup Common User Transmission Infrastructure - Native Vegetation Clearing Permit

Supporting Document

October 2023



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1 Introduction

1.1 Project Context

Regional Power Corporation, trading as (T/A) Horizon Power, is a Western Australian (WA) Government Trading Enterprise (GTE) and the state's regional and remote energy provider. Horizon Power operates under the *Electricity Corporations Act 2005* and is governed by a Board of Directors accountable to the Minister for Energy.

Horizon Power is proposing to construct the Burrup Common User Transmission Infrastructure ('the Project') which expands the North-West Interconnected System (NWIS) via construction of an approximately 7 km long 132 kilovolt (kV) overhead transmission line, between the Dampier substation and the Burrup Strategic Industrial Area (SIA) within the Pilbara region (see Figure 1). The Project will require the clearing of native vegetation.

The Project will provide common user transmission infrastructure (electricity transmission infrastructure such as overhead lines and substations to provide grid connection for an area) owned and operated by Horizon Power. As a result, the Project will also provide opportunities for tenants on the Burrup Peninsula to access the higher efficiency generation portfolio, including proposed renewable energy resources available on the NWIS. Land constraints on the Burrup Peninsula limit the feasibility of large-scale renewables, therefore the project represents an important pathway for decarbonisation on the peninsula. The Project is considered the first step to providing enabling infrastructure to the Burrup SIA to support the transition towards State and Federal Government emission reduction targets.

Horizon Power referred the Project to the WA Environmental Protection Authority (EPA) under Part IV (Section 38) of the *Environmental Protection Act 1986* (EP Act) in November 2022 (EO number: APP-0000116), as the Project is a significant Proposal that has the potential to impact on one or more of the EPA's key environmental factors. The assessment work concluded that all factors can be managed through avoidance and mitigation measures to meet the EPA's objectives. The EPA responded on 14 August 2023, confirming that the project does not require further assessment under Part IV of the Act.

Horizon Power referred the Project to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) under the *Environment Protection and Biodiversity Act 1999* (EPBC Act) in November 2022 (EPBC 2022/09407), due to potential impacts to a National Heritage Place and listed threatened species. DCCEEW responded on 3 April 2023, confirming that the Project is considered to be a Controlled Action and that the project will require assessment and approval under the EPBC Act before it can proceed. The Preliminary Documentation is currently expected to be submitted in October 2023.

The Clean Energy Finance Corporation (CEFC) is administering $19 billion of low-cost finance for Rewiring the Nation. CEFC will ensure the effective management of financial resources to support this initiative. Horizon Power's proposal to construct common user transmission infrastructure to connect Woodside's Maitland Solar Farm to the Pluto LNG Facility (Pluto LNG) on the Burrup Peninsula is expected to be one of the first projects funded under this initiative for Western Australia. Horizon Power is currently in the process of negotiating terms with CEFC.

1.2 Scope and Purpose

This document has been prepared to support a Native Vegetation Clearing Permit (NVCP) application (Purpose permit) for the Project. Specifically, this document provides further detail regarding the proposed activities and related clearing (including application of the mitigation hierarchy), and ecological surveys undertaken within and near to the clearing footprint.

An assessment of the 10 Clearing Principles as outlined in '*A guide to the assessment of applications to clear native vegetation*' (DER, 2014) has been undertaken and is presented Section 8.

A Construction Environment Management Plan (CEMP) was prepared in support of the EPA referral and is provided as Attachment A.

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2 Description of the Activity

2.1 Project Location

The Project is located in Murujuga (referred to as the Burrup Peninsula here after), Western Australia, approximately 1.5 km east of the Dampier township. The NVCP application area is referred to as the 'Development Envelope (DE)' throughout, and is shown on Figure 1. The primary land use of the DE is Strategic Industry. The remainder of the land within the DE is zoned as District Roads as per the local planning scheme.

The DE has a total extent of 85.54 ha, which represents the boundary within which all development will be contained. The detailed design for the Project has not yet been finalised, however no more than 14.40 ha of clearing (including up to 11.50 ha of permanent clearing and 2.90 ha of temporary disturbance) is proposed for construction of the transmission line, new Burrup substation, access tracks, associated electrical infrastructure and the extension of the existing Dampier substation.

The DE also contains an avoidance area footprint covering 5.37 ha (referred to as 'avoidance areas' also displayed on Figure 1) in order to avoid impacts to significant environmental and heritage values identified within the area. Therefore, the proposed clearing of up to 14.40 ha will take place within 85.54 ha DE. It should be noted that the northern quarter of the DE is highly constrained by Aboriginal cultural heritage values and environmental values (namely the Priority 1 'Burrup Peninsula rock pile communities' PEC). In the unlikely event that construction of the Project is constrained by Aboriginal cultural heritage (i.e. an unexpected find during initial ground disturbing works) within this area, minor clearing within a section of the 'avoidance areas' may be required. This is discussed further in Table 5.

Land details for the relevant land parcels have been provided in the NVCP Application Form and are summarised below (Table 1).

Table 1 Site locations and land uses

Site locations	Shire	Previous Clearing	Neighbouring land uses
Volume LR3003 Folio 200 Lot 640 on Deposited Plan 29300	Shire of Roebourne	6.63 ha	Surrounded by industrial land uses and the Murujuga National Park. Also situated in close proximity to heritage places of interest.
Volume LR3062 Folio 334 Lot 24 on Deposited Plan 241372			
Volume LR3103 Folio 188 Lot 366 on Deposited Plan 215500			
Volume LR3115 Folio 940 Lot 464 on Deposited Plan 194584			
Volume LR3121 Folio 892 Lot 156 Dampier Road, BURRUP (on Deposited Plan 215598)			
Volume LR3122 Folio 48 (Subject to Dealing) Lot 538 on Deposited Plan 221364			
Volume LR3126 Folio 50 (Subject to Dealing) Lot 644 on Deposited Plan 28840			
Volume LR3139 Folio 36 (Subject to Dealing) Lot 3013 on Deposited Plan 42282			
Volume LR3155 Folio 804 Lot 669 on Deposited Plan 32484			
Volume LR3155 Folio 805 Lot 678 on Deposited Plan 32810			
Volume LR3167 Folio 955 Lot 550 on Deposited Plan 406755			
Volume LR3167 Folio 956 Lot 551 on Deposited Plan 406755			
Volume LR3167 Folio 957 Lot 552 on Deposited Plan 406755			
Volume LR3167 Folio 959 Lot 554 on Deposited Plan 406755			
Volume LR3167 Folio 960 Lot 555 on Deposited Plan 406755			
Volume LR3167 Folio 963 Lot 558 on Deposited Plan 406755			
Volume LR3167 Folio 964 Lot 559 on Deposited Plan 406755			

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DAMPIER ARCHIPELAGO

Mof Rd

Rob Vitenbergs Dr

King Bay Rd

Griffin Rd

Village Rd

Hammonds Rd

Hearson Cove Rd

BURRUP

Burrup Rd

Dampier Rd

DAMPIER

Legend

- Major Road
- Minor Road
- Development Envelope
- Avoidance Areas

0 250 500 1,000
Meters

N

Scale: 1:20,000 (A3 Print)

Project Name: Burrup Common User Transmission Infrastructure – NVCP
Projection: GDA2020 MGA Zone 50
Sources: Jacobs - Development Envelope; Landgate - Roads, WA Now accessed September 2023
Map Produced: 9/13/2023.
Project Number: IS472900
Rev A

Jacobs
JACOBS, Mia Yellagonga Tower 2, Level 5, 5 Spring Street,
(GPO Box H615) | Perth WA 6000 | Australia
Tel: +61 8 9469 4400 Fax: +61 8 9469 4488

Figure 1 - Project Location

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2.2 Activity Overview and Timelines

The Project proposes construction of an approximately 7 km long 132 kV overhead transmission line between the Dampier substation and the Burrup SIA, which is not currently connected via transmission infrastructure to the NWIS. This new transmission line will connect into a new substation on the Burrup, and the Dampier substation will be expanded at the southern extent of the DE.

Construction of the Project will include the following permanent and temporary elements, all within the DE:

- Permanent elements:
  - approximately 7 km long 132 kV overhead transmission line;
  - approximately 40 poles and cleared pole access pads (40 m x 20 m), and associated pole stays along the transmission line route;
  - cleared, unsealed access track along the transmission line route required for maintenance during operations;
  - Burrup substation (inclusive of 33 kV and 132 kV switchgear, large scale battery, transformers, fencing and ancillary equipment);
  - Dampier substation expansion (inclusive of 132 kV switchgear, fencing and ancillary equipment); and
  - associated electrical infrastructure.
- Temporary elements:
  - additional areas required to construct the transmission line;
  - cleared access track (4 m wide) for the purpose of stringing the transmission line; and
  - 50 m x 40 m winch sites as required.

Construction of the Project is planned to commence in Q3 2024 for a period of approximately 18 months, subject to approvals.

Upon completion of construction, the Project will be incorporated into the NWIS operations. The completed transmission line will be subject to normal routine, recurrent and periodic maintenance during operation.

2.3 Land Access

As an 'energy operator', Horizon Power has certain rights under Sections 46 and 49 of the *Energy Operators (Powers) Act* 1979 which allow it to access and use land for the purpose of constructing, maintaining and operating electricity infrastructure. Horizon Power will utilise these powers for the transmission line portion of the works. A Management Order is being obtained for the substation.

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3 Description of Proposed Clearing

3.1 Proposed Clearing Area

An area of up to 14.40 ha within the DE is required to be cleared for the Project. This area includes both temporary and permanent clearing.

The DE has a total extent of 85.54 ha, which represents the boundary within which all development will be contained (Figure 1). The detailed design for the Project has not yet been finalised, however to ensure the Project avoids impacts to significant environmental and heritage values identified within the DE, an avoidance area footprint covering 5.37 ha has been developed (referred to as 'avoidance areas') within the DE. The finalised detailed design will avoid these 'avoidance areas' to minimise impacts to environmental and Aboriginal cultural heritage values as far as possible.

As the location of disturbance is not yet determined, the DE (85.54ha) reflects the overall area in which the clearing may occur to allow for flexibility to avoid existing 'avoidance areas' and any Aboriginal heritage sites if identified by monitors during clearing. Horizon Power has committed to clearing no more than 14.40 ha of vegetation, therefore, the maximum area of disturbance for the Project is 14.40 ha within the DE. It should be noted that the 14.40 ha clearing extent represents the maximum area of clearing required to construct and install the Project, and where opportunities are available, clearing will be minimised.

In the unlikely event that construction of the Project is constrained by Aboriginal cultural heritage (i.e. an unexpected find during initial ground disturbing works) within this area, minor clearing within a section of the 'avoidance areas' may be required. This is discussed further in Table 5.

Of the 14.40 ha clearing proposed, 2.90 ha would be temporary clearing to facilitate construction, and 11.5 ha would be permanent clearing.

Permanent mechanical clearing is required for the following:

- pole footings;
- Pole access pads;
- Installation of the stay wires;
- Installation of substation components; and
- Access tracks.

Temporary clearing will also be required for the following:

- Winch sites – winch sites may be required at sections of the overhead transmission line depending on the selected installation methodology; and
- Construction machinery and vehicle movements.

3.2 Proposed Clearing Method

Permanent clearing of native vegetation will primarily be undertaken by mechanical methods. Temporary clearing includes driving over vegetation during construction and mechanical removal as required.

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4 Ecological Survey

Five surveys have been undertaken within and adjacent to the Project (Appendix B), which provide full survey data coverage for the DE:

- Woodside Power Project Flora and Vegetation Surveys (Desktop assessment report) (VLA, 2019)
- Horizon Power 124-KRT-DMP 132kV Line Upgrade Project (Flora and Fauna Survey) (GHD, 2019)
- Horizon Power Burrup Expansion Project (Flora and Vegetation Survey) (GHD, 2020a)
- Woodside Power Pty Ltd – Hybrid Renewable Power Plant (Fauna Survey) (GHD,2020b)
- Technical Memorandum – Rev-0 Burrup Additional Areas Reconnaissance/Basic Survey (GHD, 2022)

These surveys are summarised in Table 2.

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Table 2 Summary of Ecological Surveys Relevant to the Survey Area

Survey	Summary of Findings
Woodside Power project – Flora and Vegetation Survey (Desktop Assessment Report) (VLA, 2019)	**Survey Dates:** 10 to 14 June 2019 and 23 July 2019 **Survey Area:** 1489.9 ha **Flora / Vegetation Findings:** – No *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed Threatened flora were recorded within the survey area. – No *Biodiversity Conservation Act 2016* (BC Act) listed Threatened flora were recorded within the survey area. – No ecological communities listed under the EPBC Act or BC Act were recorded within the survey area. – One vegetation type was considered by the field botanist to be of high conservation value (AcAx?Tt) due to the low number of occurrences. – Three Priority (P) flora species listed by the Department of Biodiversity, Conservation and Attractions (DBCA) were recorded during the survey: • *Vigna tridiophila* (P3); • *Terminalia supranitifolia* (P3); and • *Rhynchosia bungarensis* (P4). – 48 vegetation types were recorded within the survey area. – Eight vegetation types were disturbance and weed free, hence in excellent condition. One of the most represented along the northern section, GpTeBaTs, was classified as being generally in excellent condition but the gas pipeline running immediately parallel to it was totally degraded by weeds, indicating the susceptibility of vegetation to disturbance. Rockpile vegetation in some cases had been invaded by weeds spreading from these previously disturbed areas, hence vegetation condition scores were lower than would be expected. Vegetation condition over much of the southern area was difficult to estimate due to the dormancy of grasses and weed species. However, from rootstock present, it was apparent that the DBNGP alignment housed varying amounts of buffel grass (**Cenchrus ciliaris*) and some kapok (**Aerva javanica*). Buffel grass was also found along some drainage lines, around some of the stonier scalds throughout the area and in areas of disturbance within or in close proximity to the Rio Tinto Dampier Salt lease. In General, most of the extent in the survey area are Excellent to Good condition, however, there is also an expressive extent of Cleared area (19.2ha) – Riparian vegetation was not recorded within the survey area.
Horizon Power 124-KRT-DMP 132kV Line Upgrade Project (Flora and fauna Survey) (GHD, 2019) *IBSA Number: IBSA-2019-0160*	**Survey Dates:** 5 and 4 June 2019, and 22 and 23 July 2019. **Survey Area:** 39.36 ha **Flora / Vegetation Findings:** – No EPBC Act or BC Act listed Threatened flora were recorded within the survey area. – No ecological communities listed under the EPBC Act were recorded within the survey area. – Two ecological communities listed under the BC Act were recorded within the survey area – Burrup Peninsula rock pile communities (P1) PEC, and Horseflat land system of the Roebourne Plains (P3) PEC. – One Priority flora species listed by the DBCA was recorded during the survey: • *Rhynchosia bungarensis* (P4).

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Survey	Summary of Findings
	– Nine vegetation types were recorded within the survey area. – The vegetation condition throughout the survey area was generally Very Good (10.3 ha) to Good (7.31ha) condition. The exceptions were areas that had been previously cleared (14.81 ha) or disturbed (1.14 ha and 1.23ha) such as roads and access tracks, roadsides, and along the existing pipelines and power lines, where the weed species *_Cenchrus ciliaris_ (Buffel grass) and *_Aerva javanica_ (Kapok bush) were more common. Fire has also had an impact on the structure and condition of the vegetation throughout the survey area. – Riparian vegetation was recorded within the survey area (VT 05). **Fauna / Fauna Habitat Findings:** – Six fauna habitats were recorded within the survey area. – No EPBC Act or BC Act listed fauna species were recorded during the survey. – No Priority listed fauna species were recorded during the survey. – The following additional conservation listed species are considered likely to occur within the survey area: • Peregrine Falcon (*Falco Peregrinus*) – Other specially protected; • Osprey (*Pandion haliaetus*) – Migratory species (BC Act, EPBC Act, Bonn); • Northern Quoll (*Dasyurus hallucatus*) – Endangered; • Water-rat (*Hydromys crysohaster*) – Priority species (P4); • Pilbara Olive Phython (*Liasis olivaceus subsp. Barroni*) – Vulnerable; and • Lined soil-crevice skink (Dampier) (*Notoscincus butleri*) – Priority species (P4).
Horizon Power Burrup Expansion Project (Flora and Vegetation Survey) (GHD, 2020a) *IBSA Number: IBSA-2022-0353*	**Survey Dates:** 23 to 28 April 2020 **Survey Area:** 805.87 ha **Flora / Vegetation Findings:** – No EPBC Act listed Threatened flora were recorded within the survey area. – No BC Act listed Threatened flora were recorded within the survey area. – No ecological communities listed under the EPBC Act were recorded within the survey area. – Two ecological communities listed under the BC Act were recorded within the survey area – Burrup Peninsula rock pile communities (P1) PEC, and Horseflat land system of the Roebourne Plains (P3) PEC. – Four Priority flora species listed by the Department of Biodiversity, Conservation and Attractions (DBCA) were recorded during the survey: • *Rhynchosia bungarensis* (P4); • *Terminalia supranitifolia* (P3); • *Vigna triodiophila* (P3); and • *Oldenlandia* sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3). – Nineteen vegetation types were recorded within the survey area.

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Survey	Summary of Findings
	– The majority of the survey area contained vegetation of Good to Very Good condition, considering historical clearing for development on the Burrup Peninsula and surrounds. Areas of Excellent condition vegetation were found in the southern portion of the survey area, which were completely undisturbed (i.e. no access tracks, existing power lines or exploration). – Riparian vegetation was not recorded within the survey area.
Woodside Power Pty Ltd – Hybrid Renewable Power Plant (Fauna Survey) (GHD, 2020b)	**Survey Dates:** 10th to 13th June and 22nd to 24th July 2019 **Survey Area:** 1,367.38 ha **Fauna / Fauna Habitat Findings:** – Nine fauna habitats were recorded within the survey area – Four migratory species listed under the EPBC Act and BC Act were recorded including Whimbrel (*Numenius phaeopus*), Gull-billed Tern (*Gelochelidon nilotica*), Caspian Tern (*Hydroprogne caspia*), and Crested Tern (*Thalasseus bergii*). Two priority listed species (under DBCA) the Western Pebble-mound Mouse (*Pseudomys chapmani*) and North-western Free-tail Bat (*Mormopterus (Ozimops) cobourgianus*) were also recorded. – The following additional conservation listed species are considered likely to occur within the survey area: • Northern Quoll (*Dasyurus hallucatus*) – Endangered; • Pilbara Olive Python (*Liasis olivaceus barroni*) – Vulnerable; • Peregrine Falcon (*Falco peregrinus*) – Other specially protected; • Northern Short-tailed Mouse (*Leggadina lakedownensis*) – Priority species (P4); • Lined Soil-crevice Skink (*Notoscincus butleri*) – Priority species (P4); • Bridled Tern (*Onychoprion anaethetus*) – Migratory species (BC Act, EPBC Act, CAMBA, JAMBA; • Wood Sandpiper (*Tringa glareola*) – Migratory species (BC Act, EPBC Act, Bonn, CAMBA, JAMBA, ROKAMBA; • Common Greenshank (*Tringa nebularia*) – Migratory species (BC Act, EPBC Act, Bonn, CAMBA, JAMBA, ROKAMBA); • Oriental Pratincole (*Glareola maldivarum*) – Migratory species (BC Act, EPBC Act, CAMBA, JAMBA, ROKAMBA; • Oriental Plover (*Charadrius veredus*) – Migratory species (BC Act, EPBC Act, Bonn, CAMBA, JAMBA, ROKAMBA; and • Common Sandpiper (*Actitis hypoleucos*) – Migratory species (BC Act, EPBC Act, Bonn, CAMBA, JAMBA, ROKAMBA.
Technical Memorandum – Rev-0 Burrup Additional Areas Reconnaissance/Basic Survey (GHD, 2022) *IBSA Number: IBSA-2022-0393*	**Survey Dates:** 3 and 4 August, 2022 **Survey Area:** 13.67 ha **Flora / Vegetation Findings:** – No EPBC Act listed Threatened flora were recorded within the survey area. – No BC Act listed Threatened flora were recorded within the survey area. – No ecological communities listed under the EPBC Act or BC Act were recorded within the survey area. – One Priority flora species listed by the Department of Biodiversity, Conservation and Attractions (DBCA) were recorded during the survey:

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Survey	Summary of Findings
	• *Terminalia supranitifolia* (P3). – Four vegetation types were recorded within the survey area. – Vegetation condition within the additional survey areas ranges from Very Good (2.50 ha) to Good (8.77 ha). The vegetation structure across the additional survey areas is identified as being in Good to Very Good condition, due to the minimal signs of disturbance and presence of little to no weeds. – Riparian vegetation was not recorded within the survey area. **Fauna / Fauna Habitat Findings:** – Three fauna habitats were recorded within the survey area. – No EPBC Act or BC Act listed fauna species were recorded during the survey. – No Priority listed fauna species were recorded during the survey. – The following additional conservation listed species are considered likely to occur within the survey area: • North-western Free-tail Bat (*Mormopterus (Ozimops) cobourgianus*) – Priority species (P1); • Western Pebble-mound Mouse (*Pseudomys chapmani*) – Priority species (P4); • Whimbrel (*Numenius phaeopus*) – Migratory species (BC Act, EPBC Act, Bonn, CAMBA, JAMBA, ROKAMBA); • Gull-billed Tern (*Gelochelidon nilotica*) – Migratory species (BC Act, EPBC Act, CAMBA); • Caspian Tern (*Hydroprogne caspia*) – Migratory species (BC Act, EPBC Act, JAMBA); and • Crested Tern (*Thalasseus bergii*)– Migratory species (BC Act, EPBC Act, JAMBA).

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5 Existing Environment

The existing environment is summarised in Table 3.

Table 3 Existing environment

<table>
<tr><th>Environmental value</th><th>Assessment</th></tr>
<tr><td>Vegetation associations, types and condition</td><td>
The Project is located within Pre-European Vegetation Association 117 (Abydos Plain – Roebourne). More than 96.36% of this vegetation association remains in the State, with 14.79% in DBCA managed lands. In the Interim Biogeographic Regionalisation for Australia (IBRA) Roebourne subregion, 92.03% of this vegetation association remains, with 37.53% in land managed by DBCA.
<table>
<tr><th>Vegetation association</th><th>Scale</th><th>Pre-European extent (ha)</th><th>Current extent (ha)</th><th>% Remaining</th><th>% of current extent in all DBCA managed land (proportion of current extent)</th></tr>
<tr><td rowspan="4">Abydos Plain – Roebourne (117)</td><td>State: WA</td><td>919,517.05</td><td>886,005.79</td><td>96.36</td><td>14.79</td></tr>
<tr><td>IBRA Bioregion: Pilbara</td><td>82,705.78</td><td>78,096.64</td><td>94.43</td><td>22.54</td></tr>
<tr><td>IBRA Subregion: Roebourne</td><td>50,962.94</td><td>46,901.57</td><td>92.03</td><td>37.53</td></tr>
<tr><td>Local Government Authority (LGA): City of Karratha</td><td>41,173.74</td><td>31,921.58</td><td>77.53</td><td>58.03</td></tr>
</table>
The 85.54 ha DE comprises 78.98 ha of native vegetation representing thirteen vegetation types (VTs) (VLA 2019, GHD 2019, 2020a & 2022). The remaining land within the DE (6.63 ha) is cleared, with these areas containing roads (and associated infrastructure), tracks and areas cleared for pastoralism (GHD 2019, 2020a & 2022).
The vegetation within the DE is dominated by hummock grasslands of *Triodia epactia* and *T. wiseana* with scattered to open shrublands dominated by *Acacia, Hakea, Grevillea* and *Senna* species on rocky sandy loam plains and low undulating rocky rises and slopes.
The surveys (GHD 2019, 2020a & 2022) also recorded vegetation condition across the DE. The DE comprises 78.97 ha native vegetation, of which 0.62 ha (0.7%) is in Excellent condition, 53.01 ha (53%) is in Very Good condition, 21.66 ha (25.1%) is in Good condition, 3.36 ha (3.9%) is in Poor condition, and the remaining 6.97 ha (8.1%) is in Degraded or worse condition.
Completely Degraded or Poor condition vegetation is associated with previously cleared and disturbed areas adjacent to roads and access tracks GHD (2020a). Areas of Excellent condition vegetation were found in areas which were completely undisturbed (i.e. no access tracks, existing power lines or exploration). Fire history did not have a significant impact on the structure and condition of vegetation within the DE, as the majority of the vegetation was long unburnt (6 years or longer) or of moderate age (3 to 5 years) (GHD 2020a).
The table below provides a summary of the VTs and vegetation condition within the DE.
<table>
<tr><th>Vegetation type</th><th>Vegetation description</th><th>Vegetation extent within the DE (ha)</th><th>Condition</th><th>Condition extent (ha) within the DE</th></tr>
<tr><td>AbCc</td><td>Acacia bivenosa tall open to shrubland over *Cenchrus ciliaris tussock grassland, sometimes closed tussock grassland, with patchy Triodia angusta.</td><td>0.02</td><td>Degraded</td><td>0.02</td></tr>
<tr><td>AbImTe</td><td>Acacia bivenosa, Acacia pyrifolia subsp morrisonii, Grevillea pyramidalis open shrubland over</td><td>0.02</td><td>Good</td><td>0.02</td></tr>
</table>
</td></tr>
</table>

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Environmental value	Assessment				
		Indigofera eschenau, Corchorus walcottii open low shrubland over *Triodia epactia* hummock grassland with patchy **Cenchrus ciliaris* tussock grassland.			
	EvAbTa	*Eucalyptus victrix* open to scattered low woodland with scattered *Corymbia hamersleyana* over *Acacia bivenosa* tall open shrubland over *Adriana tomentosa / Indigofera eschenau* open low shrubland over *Triodia angusta / T. epactia* open to hummock grassland.	0.02	Very Good	0.01
				Good	0.005
	GpCc	*Grevillea pyramidalis* (regenetrating) scattered to open tall shrubland over **Cenchrus ciliaris* tussock and *Triodia epactia* hummock grassland	0.02	Poor	0.02
	GpTeBaTs	*Grevillea pyramidalis* scattered to open tall shrubland, sometimes with scattered *Hakea lorea subsp lorea, Ipomoea costata, Acacia inaequilatera* over *Triodia epactia* hummock grassland, sometimes patchy *T. angusta*. There can be open low *Indigofera eschenau* shrubland.	0.36	Excellent	0.32
				Very Good	0.04
				Good	0.001
	TsIcTe	*Terminalia supranitifolia* low open woodland over *Ipomoea costata, Acacia coriacea, Dichrostachys spicata, Grevillea pyramidalis* mixed shrubland over scattered to open *Triodia epactia* hummock grass sometimes *Themeda triandra*. Scattered *Brachychiton acuminatus*	0.001	Excellent	0.001
	Tspp	*Tecticornia halocnemoides subsp tenuis, T. eschena, T. indica* subsp *leiostachya*, with *Muellerolimon salicorniaceum* open low shrubland with patchy *Avicennia marina* trees.	0.30	Excellent	0.29
				Good	0.01
	VT01	*Brachychiton acuminatus* scattered low trees over *Grevillea pyramidalis subsp. Pyramidalis, Terminalia supranitifolia* (P3) and *Flueggea virosa subsp. Melanthesoides* scattered shrubs over *Triodia epactia* open hummock grassland over *Cymbopogon eschenau* and **Cenchrus ciliaris* open tussock grassland and *Tinospora smilacina* and *Ipomoea costata* open vineland on rock piles.	1.74	Very Good	1.48
				Good	0.26
	VT02	*Corymbia hamersleyiana* open woodland over *Acacia bivenosa, Grevillea pyramidalis subsp. Pyramidalis* and *Hakea lorea subsp. Lorea* scattered shrubs over *Triodia epactia* open hummock grassland with **Cenchrus ciliaris* scattered grass over *Hybanthus aurantiacus, Cleome viscosa* and *Trichodesma zeylanicum var. zeylanicum* open forbland on brown sandy loam on elevated rocky plain.	2.42	Very Good	2.01
				Good	0.2
				Poor	0.21
	VT03	*Eucalyptus victrix* open woodland over *Terminalia circumalata* low open woodland over *Triodia wiseana* open hummock grassland with **Cenchrus ciliaris* and *Eriachne benthamii* scattered tussock grasslands over *Hybanthus aurantiacus, Indigofera trita* and *Gossypium austral* scattered herbs on rocky sandy loam on minor drainage lines.	6.57	Very Good	5.61
				Good	0.96
	VT04	*Tecticornia indica* subsp. *Leiostachya* and *Tecticornia pterygosperma* low chenopod	5.46	Very Good	4.79
				Good	0.67

<table>
<tr><th>Environmental value</th><th>Assessment</th></tr>
<tr><td></td><td>
<table>
<tr><td></td><td>shrubland with scattered Avicennia marina on saline flats with tidal inundation.</td><td></td><td>Poor</td><td>0.001</td></tr>
<tr><td>VT05</td><td>*Cenchrus ciliaris open grassland over Trianthema turgidifolia and Neobassia astrocarpa open chenopod shrubland on disturbed edges of saline flats.</td><td>3.23</td><td>Very Good</td><td>0.26</td></tr>
<tr><td></td><td></td><td></td><td>Good</td><td>2.06</td></tr>
<tr><td></td><td></td><td></td><td>Poor</td><td>0.91</td></tr>
<tr><td>VT06</td><td>Grevillea pyramidalis subsp. Pyramidalis and *Vachellia farnesiana scattered shrubs over Ipomoea costata, Indigofera eschenau and Scaevola spinescens open shrubland over Triodia epactia open hummock grassland over Cleome viscosa, Rhynchosia minima and Hybanthus aurantiacus scattered herbs on red/brown sandy loam on rocky slopes with frequent basalt outcropping.</td><td>58.86</td><td>Very Good</td><td>38.87</td></tr>
<tr><td></td><td></td><td></td><td>Good</td><td>17.36</td></tr>
<tr><td></td><td></td><td></td><td>Poor</td><td>2.32</td></tr>
<tr><td></td><td></td><td></td><td>Completely Degraded</td><td>0.31</td></tr>
<tr><td>Cleared</td><td>N/A – Cleared</td><td>6.52</td><td>N/A</td><td>6.52</td></tr>
<tr><td>Total</td><td></td><td>85.54</td><td>N/A</td><td>85.54</td></tr>
</table>
Significant ecological communities (Threatened and Priority Ecological Communities) are addressed in the ‘Ecological communities’ row of this table (Table 3). Other significant vegetation recorded in the DE is associated with the drainage lines that intersect the DE. Minor drainage lines which dissect the plain and rocky slopes are lined by Corymbia hamersleyana and Eucalyptus victrix (GHD 2020a). Within the DE, VT03 and EvAbTa are considered to represent riparian vegetation. There is 6.59 ha of riparian vegetation within the DE.
In addition, three vegetation types (Tspp, VT04 and VT05) growing in association with the tidal inlet between Hearson Cove and King Bay may have some significance due to their limited distribution and impacts from threatening processes such as clearing and development. There is 8.99 ha of intertidal adapted vegetation within the DE.
</td></tr>
<tr><td>Fauna habitat</td><td>
Five fauna habitat types (not including cleared and disturbed areas) have been mapped across 78.24 ha of the 85.54 ha DE. These fauna habitats align with the vegetation types identified above, and are associated with the rocky hills, grasslands, drainage lines and mudflats that are present within the DE. A summary of fauna habitat types present within the DE are detailed below. Disturbed areas cover 0.78 ha of the DE and are considered to be of minimal value to fauna. The remaining 6.52 ha within the DE is cleared and is not considered to provide habitat for fauna species.
<table>
<tr><th>Fauna habitat types</th><th>Fauna habitat value</th><th>Extent within the DE (ha)</th></tr>
<tr><td>Hummock Grassland on Rocky Plain
This habitat type is mostly dominated by a Triodia hummock grassland with heavy loam stony soils. The vegetation is a mosaic of shrubs however is dominated by Acacia, Hakea and Grevillia over hummock grasses. Litter, woody debris and branches were present in areas where shrubs were present. No logs or hollows were observed due to the vegetation structure present.</td><td>Moderate to High value
Habitat that typically supports high diversity of small vertebrate fauna and provides foraging habitat to Peregrine Falcon. The Northern Short-tailed Mouse and Lined Crevice Skink may also utilise this habitat.</td><td>9.48</td></tr>
<tr><td>Hummock Grassland on Low Rocky Hills
This habitat type is mostly dominated by a Triodia hummock grassland however does support tussock grasses and scattered Acacia shrubs. The crests of the low hills contain rocky substrates but lacks the extensive boulder piles in the surrounding taller hills. Limited litter and woody</td><td>Moderate to High value
Supportive habitat for species foraging and dispersal particularly the Northern Quoll and Pilbara Olive Python.</td><td>10.89</td></tr>
</table>
</td></tr>
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<table>
<tr><th>Environmental value</th><th>Assessment</th></tr>
<tr><td></td><td>
<table>
<tr><td>debris is present and no logs, branches or hollows are available.</td><td></td><td></td></tr>
<tr><td>Minor Drainage
Limited to the linear drainage systems which flow randomly amongst the rocky hills or on the plains. They primarily consist of a thin, linear corridor of denser vegetation which drain into the intertidal mudflats and coastline. This habitat type is mostly dominated by Eucalypt Woodland. Understorey includes Triodia hummock grassland and Buffel Grass (Cenchrus spp.) and mixed small shrub species.</td><td>High value
Linear corridor of habitat potentially utilised by Northern Quoll, Pilbara Olive Python, Peregrine Falcon, Northern Short-tailed Mouse and Lined Crevice Skink on the plain. A fauna corridor for all other species on the plain.</td><td>6.54</td></tr>
<tr><td>Mudflat with Tidal Inundation, Mangroves and Supportive Scattered Samphire
Vegetation is minimal except where the mudflats fringe mangroves and samphire. Areas become inundated with water during high tides and retracts to several small pools and a minor drainage line during the low period.</td><td>High value
Provides habitat for Migratory birds, North-western Free-tailed Bat and Peregrine Falcon.</td><td>7.76</td></tr>
<tr><td>Rocky Hills with Exposed Boulder Piles
This habitat type is mostly dominated by a Triodia hummock grassland however does support tussock grasses and scattered Acacia shrubs. The boulder rock piles are typically devoid of ground cover. The Ficus, Brachychiton and Acacia provided litter and scattered woody debris, however the boulder piles provide extensive cover via crevices, small caves and cavities.</td><td>High value
Core habitat for Northern Quoll and Pilbara Olive Python.
Foraging habitat for the Peregrine Falcon.</td><td>43.57</td></tr>
<tr><td colspan="2">Total</td><td>78.24</td></tr>
</table>

Fauna habitats within the DE have moderate to high habitat value in the context of the surrounding environment. Overall, the habitats contain a diversity of fauna, and all provide habitat for significant fauna species (mostly Migratory birds) that are present or likely to be present in the local area. There is only a small amount of habitat within the survey area for the Migratory bird species to utilise. There is habitat (tidal mudflats) available in King Bay and within Hearson Cove of much larger real estate for wading species to utilise in the region.</td></tr>
<tr><td>Significant fauna</td><td>Updated desktop searches have been undertaken for this assessment, which identified the presence/potential presence of 78 significance fauna within a 20 km radius of the DE. This total does not include those species that are exclusively marine as no marine habitat is present within the DE.
The desktop searches recorded:
– 22 species listed as Threatened under the EPBC Act and/or the BC Act;
– 49 species listed as Migratory under the EPBC Act and/or the BC Act;
– One species listed as Specially protected species (Other specially protected fauna) under the BC Act; and
– Six species listed as Priority by DBCA.
No Threatened or Priority fauna species were recorded within the DE during the GHD (2019 & 2022) surveys. The GHD (2020b) survey recorded evidence of three significant fauna species within the DE:
– Western Pebble-mound Mouse (Pseudomys chapmani) – DBCA: Priority 1;
– North-western Free-tail Bat (Mormopterus (Ozimops) cobourgianus) – DBCA: Priority 1; and
– Whimbrel (Numenius phaeopus) – EPBC Act: Migratory and BC Act: Protected under International Agreement.
Evidence of the Western Pebble-mound Mouse was limited to an old, inactive mound that was present on the rocky hills in the DE (GHD 2020b). Start (1996) surveys recorded very limited presence of active mounds on the Burrup Peninsula and the species is considered locally extinct.
A likelihood of occurrence assessment has been undertaken, which concluded that 26 significant fauna species have the potential to occur within the DE (Appendix C). This likelihood of occurrence assessment was</td></tr>
</table>

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Environmental value	Assessment

based on species biology, habitat requirements, the quality and availability of suitable habitat, and local occurrence. The remaining species identified during the desktop assessment were considered unlikely or highly unlikely to occur within the DE. Suitable habitat for these species is detailed below, including the extent of suitable habitat in the DE. No more than 14.4 ha of clearing is proposed.

Fauna species	EPBC Act Listing	BC Act / DBCA status	Extent of suitable habitat within the DE (ha)
Northern Quoll (*Dasyurus hallucatus*)	Endangered	Endangered	61.0
Pilbara Olive Python (*Liasis olivaceus barroni*)	Vulnerable	Vulnerable	61.0
Ghost Bat (*Macroderma gigas*)	Vulnerable	Vulnerable	34.67
Grey Falcon (*Falco hypoleucos*)	Vulnerable	N/A	78.24
Curlew Sandpiper (*Calidris ferruginea*)	Critically Endangered	Critically Endangered	7.76
Eastern Curlew (*Numenius madagascariensis*)	Critically Endangered	Critically Endangered	7.76
Greater Sand Plover (*Charadrius eschenaultia*)	Vulnerable	Vulnerable	7.76
Lesser Sand Plover (*Charadrius mongolus*)	Critically Endangered	Endangered	7.76
Red Knot (*Calidris canutus*)	Endangered	Endangered	7.76
Northern Siberian Bar-Tailed Godwit (*Limosa lapponica menzbieri*)	Critically Endangered	Protected under International Agreement	7.76
Australian Fairy Tern (*Sternula nereis nereis*)	Vulnerable	Vulnerable	7.76
Whimbrel (*Numenius phaeopus*)	Migratory	Protected under International Agreement	7.76
Oriental Plover (*Charadrius veredus*)	Migratory	Protected under International Agreement	7.76
Wood Sandpiper (*Tringa glareola*)	Migratory	Protected under International Agreement	7.76
Oriental Pratincole (*Glareola maldivarum*)	Migratory	Protected under International Agreement	7.76
Common Sandpiper (*Actitis hypoleucos*)	Migratory	Protected under International Agreement	7.76
Common Greenshank (*Tringa nebularia*)	Migratory	Protected under International Agreement	7.76
Gull-billed Tern (*Gelochelidon nilotica*)	Migratory	Protected under International Agreement	7.76
Caspian Tern (*Hydroprogne caspia*)	Migratory	Protected under International Agreement	7.76
Crested Tern (*Thalasseus bergii*)	Migratory	Protected under International Agreement	7.76
Bridled Tern (*Onychoprion anaethetus*)	Migratory	Protected under International Agreement	7.76

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<table>
<tr><th>Environmental value</th><th>Assessment</th></tr>
<tr><td></td><td>
<table>
<tr><td>Lined soil-crevice skink (Dampier) (Notoscincus butleri)</td><td>N/A</td><td>Priority 4</td><td>26.91</td></tr>
<tr><td>Northern short-tailed mouse (Leggadina lakedownensis)</td><td>N/A</td><td>Priority 4</td><td>16.02</td></tr>
<tr><td>North-western free-tailed bat (Mormopterus cobourgianus)</td><td>N/A</td><td>Priority 1</td><td>7.76</td></tr>
<tr><td>Peregrine falcon (Falco peregrinus)</td><td>N/A</td><td>Other Specially Protected Fauna</td><td>78.24</td></tr>
<tr><td>Water-rat, rakali (Hydromys chrysogaster)</td><td>N/A</td><td>Priority 4</td><td>7.76</td></tr>
</table>
</td></tr>
<tr><td>Significant ecological linkage</td><td>The fauna habitats within the DE are part of a contiguous, largely intact area of remnant vegetation present on the Burrup Peninsula. Land within the Burrup SIA has been subject to clearing, but this clearing is restricted to designated industrial sites and connecting service corridors, leaving much of the remnant vegetation intact in the local area.
The ephemeral floodplain/ drainage lines within the DE drain towards the coast and the plain areas provide corridors linking the coast to the surrounding hills. Overall, the habitats within the DE are largely contiguous through the local area.</td></tr>
<tr><td>Ecological communities</td><td>A search of the Protected Matters Search Tool and other databases did not identify any Threatened Ecological Communities (TECs) listed under the EPBC Act or BC Act as occurring within the DE, which were confirmed by the surveys (GHD 2020a, 2022). However, the Priority Ecological Community (PEC) ‘Burrup Peninsula rock pile communities (Priority 1)’ was recorded within the DE as Vegetation Type 01 (VT01), GpTeBaTs and TsIcTe, with a total mapped extent of 2.1 ha within the DE. This PEC is included in the ‘avoidance areas’ that will be avoided during clearing and construction works (identified on Figure 2).
The Burrup Peninsula rock pile communities PEC is characterised by pockets of vegetation in rock piles and outcrops. The rock pile communities vary from open tussock grass assemblages with small herbs and grasses on otherwise bare calcrete, through to hummock sub-shrub communities, to dense shrub/tree communities. The PEC is restricted to Burrup Peninsula and some Dampier Archipelago islands. The ‘Burrup Peninsula rock piles community’ PEC comprises a mixture of Pilbara and Kimberley fire sensitive species (GHD 2020a).
The Burrup Peninsula rock piles communities is listed as priority 1 by the DBCA. Key threats to this PEC include clearing, altered fire regimes, emissions, weed invasion (DBCA 2022).
The vegetation type identified as representing the PEC community (Burrup Peninsula rock pile communities) will be avoided where possible as it supports Priority flora that are well represented in the area.</td></tr>
<tr><td>Significant flora</td><td>Updated desktop searches have been undertaken which identified the presence/potential presence of six significant flora taxa within a 20 km radius of the wider survey areas. This total comprised four Priority 3 taxa, one Priority 2 taxa and one Priority 1 taxon.
No threatened flora species listed under the EPBC Act or BC Act were recorded within the DE. Three DBCA-listed Priority species were recorded within the DE during the biological survey (GHD, 2020a):
– 34 individuals of Terminalia supranitifolia (P3);
– Six individuals of Rhynchosia bungarensis (P4); and
– Five individuals of Vigna triodiophila (P3).
A likelihood of occurrence assessment (adapted from the VLA [2019] and GHD [2019 & 2020a] surveys) concluded that no additional significant flora taxa were likely or have the potential to occur within the DE. The likelihood of occurrence assessment took into account previous records, habitat requirements, seasonal variation, efficacy of the survey, intensity of the survey, flowering times and the cryptic nature of the species.
The density of records are high on the Burrup Peninsula for the three Priority flora recorded during the survey as they have adapted to the habitat-type that the rock piles provide.</td></tr>
<tr><td>Wetlands and/or waterways</td><td>There are no Ramsar wetlands, Nationally Important Wetlands (DBCA,2018; DBCA, 2017) or wetlands or waterways gazetted under the Waterways Conservation Act 1976 (DWER, 2018) within the DE or surrounding area.
The Burrup Peninsula has limited surface water. No permanent water bodies are located within the DE, however numerous intermittent drainage lines are present. These drainage lines are ephemeral, with highly variable flows characterised by short periods of high-water flow associated with high intensity weather events such as tropical cyclones. The Project is located in close proximity to the tidal inlet between Hearson Cove and King Bay. This area is characterised by saline flats that experience tidal inundation.</td></tr>
</table>

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<tr><th>Environmental value</th><th>Assessment</th></tr>
<tr><td>Water resources</td><td>The DE does not overlap public drinking water source areas. The closest area is the Roebourne Water Reserve, approximately 44km to the south east of the Project.
The Project is located within the North-Pilbara Granite-Greenstone Terrane Hydrogeological province and the Pilbara-Fractured aquifer. According to the Water Information Reporting (DWER, 2023a), there is only one registered groundwater bore (Site Ref. 70970061) within the Burrup Peninsula, however, there is no data publicly available.</td></tr>
<tr><td>Conservation Reserves</td><td>The Murujuga National Park is located within close proximity, approximately 100 m north and 180 m east of the DE (DBCA,2023), which is owned by the Murujuga Aboriginal Corporation (MAC) and jointly managed by MAC and DBCA.</td></tr>
<tr><td>Environmentally Sensitive Areas</td><td>The DE does not overlap any Environmentally Sensitive Areas.</td></tr>
<tr><td>Land and soil quality</td><td>The Project is located within the Karratha Coast Zone of the Pilbara Province. The Pilbara Province lies over the Pilbara Craton, which consists of two different tectonic components. The two broad geologic sequences are the ancient Archaean granite-greenstone terrain and the younger volcano-sedimentary sequence of the Hamersley Basin (Tille, 2006).
The Karratha Coast Zone is characterised by coastal mudflats with sandy coastal plains and some hills on marine deposits and some sedimentary and volcanic rocks of the Pilbara Craton. Soils include tidal soils with some calcareous loamy earths, salt lake soils and red/brown noncracking clays (Tille, 2006).
The DE is located within the North-Pilbara Granite-Greenstone Terrane Hydrogeological province and the Pilbara – Fractured aquifer. The DE is also primarily located in areas of the Granitic land system with soils of diverse permeability and not susceptible to erosion. A small portion of the project is within the Littoral Land System which is susceptible to wind erosion if plant cover is lost by fire or other disturbances (DPIRD, 2004).
<table>
<tr><th>Land system</th><th>Description</th><th>Pre-European extent (ha)</th><th>Current extent (ha)</th><th>% Remaining</th></tr>
<tr><td>Granitic land system</td><td>Rugged granitic hills supporting shrubby hard and soft spinifex grasslands.
<u>Geology</u>: Archaean and Proterozoic granite, gneiss, granodiorite and porphyry.
<u>Geomorphology</u>: Erosional surfaces; hill tracts and domes on granitic rocks with rough crests, associated rocky hill slopes, restricted lower stony plains; narrow, widely spaced tributary drainage floors and channels.</td><td>408,456.36</td><td>407,221.69</td><td>99.70</td></tr>
<tr><td>Littoral land system</td><td>Bare coastal mudflats with mangroves on seaward fringes, samphire flats, sandy islands, coastal dunes and beaches.
<u>Geology</u>: Quaternary mudflat deposits, clay, salt and sand; eolian sand.
<u>Geomorphology</u>: Depositional surfaces; saline coastal flats; estuarine and littoral surfaces with extensive bare saline tidal flats subject to infrequent tidal inundation, slightly higher samphire flats and alluvial plains, mangrove seaward fringes with dense branching patterns of shallow tidal creeks, minor coastal dunes, limestone ridges, sandy plains and beaches.</td><td>393,122.85</td><td>355,232.73</td><td>90.39</td></tr>
</table>
The Acid Sulphate Soil (ASS) Risk Map of Pilbara Coastline (DWER-053) shows that there is 9.9 ha of ‘Moderate to low risk’ and 11.6 ha ‘High to Moderate Risk’, within the DE. This indicates that there is a high risk of ASS occurring within 3 m of the natural soil surface.
There are no known sites of contamination present within the DE (DWER, 2023b). The closest confirmed site is 1.5 km east of the northern extent of the DE. It is considered unlikely that contaminating activities have occurred within the DE given the remote location.</td></tr>
</table>

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Environmental value	Assessment
Environmental heritage	The Burrup Peninsula and its surrounds supports extensive Aboriginal cultural heritage sites, with the Dampier Archipelago (including Burrup Peninsula) listed on the National Heritage List. The Dampier Archipelago was listed as a National Heritage Place on 3 July 2007, and has been nominated for World Heritage listing, placed on Australia's World Heritage Tentative List in February 2020. The Dampier Archipelago is recognised for its unique natural and Aboriginal cultural heritage. The Archipelago formed 6 – 8,000 years ago comprises a system of islands, rocky reefs, coral reefs, shoals, channels and straits covering approximately 400 km. The underlying rocks are amongst the oldest on earth, formed in the Archaean period more than 2,400 million years ago (DCCEEW, 2022). Home to Indigenous Australians for tens of thousands of years, the Dampier Archipelago contains a diverse array of Aboriginal cultural heritage including dreaming sites, ceremonial sites, rock engravings and other archaeological sites. It is of exceptional heritage interest for its diverse array of rock engravings (potentially numbering in the millions) and stone arrangements, and the importance of these within the Aboriginal traditions of Ngarda-Ngarli people. The rock art of the Dampier Archipelago illustrates the evolution of societies, cultures and the environment over time (DCCEEW, 2022). The marine environment of the Dampier Archipelago is characterised by intertidal mud and sand flats associated with fringing mangals in bays and lagoons, a large tidal range, highly turbid water and the occurrence of fringing coral reefs around some of the islands (DCCEEW, 2022). The DE overlaps a portion of the National Heritage Dampier Archipelago, which includes the Burrup Peninsula and consists of 42 islands, islets, and rocky formations. Murujuga Aboriginal Corporation (MAC) was formed in 2006 as part of the Burrup and Maitland Industrial Estates Agreement (BMIEA) with the WA Government. MAC holds freehold title to the Murujuga National Park. There are 31 known places of Aboriginal cultural heritage significance which intersect the DE (CBG 2020, Scarp 2022). The Project avoids all known heritage sites identified by the Heritage surveys within the DE.

6 Avoidance, Mitigation and Management Measures

6.1 Avoidance

The Project has been designed to reduce the environmental impact as far as practicable and extensive consideration has been made during the alignment selection and the design refinement process to avoid impacts on flora, fauna and vegetation. Pole placement and span has been designed to avoid impacts to vegetation (including PECs) and flora as far as possible. Pole placement will avoid drainage lines, where possible, minimising impacts to riparian vegetation.

Clearing for unsealed access tracks has been optimised to a minimum trafficable width of 4 m. Horizon Power remain flexible with the Project design (specifically pole placement and span) therefore, the disturbance footprint is subject to change as the design develops.

To avoid impacts to significant environmental values identified within the Burrup as a result of the Project, 'avoidance areas' have been developed within the DE (as shown on Figure 2). The final design of the Project will avoid these 'avoidance areas' to minimise impacts to environmental values as much as possible. These 'avoidance areas' cover a total area of 5.37 ha throughout the DE, and include significant vegetation and PEC's, as well as known Aboriginal cultural heritage places. Visibly demarcating 'avoidance areas' during construction (where works are nearby) and maintaining a minimum 5 m buffer between avoidance areas and work areas will avoid inadvertent impacts.

Site selection for the DE has taken into account the CBG (2020 – CONFIDENTIAL REPORT) recommendation that 'development south of Burrup Road be avoided'. Extensive consultation has also been undertaken with Murujuga Aboriginal Corporation (MAC) on the DE location. The current DE is preferred as it already contains infrastructure and the heritage sites within it can be avoided without impact (CBG 2020).

The design of the Project has, and will continue to be, refined to minimise the extent of fauna habitat clearing. Existing cleared access tracks will be preferentially used where practical. Only minor clearing will be required within the drainage and mudflats habitat types. The construction of access tracks within the tidal inlet between Hearson Cove and King Bay, will be avoided as far as practicable, to minimise impacts to vegetation and flora within this area.

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An existing lay down area has been leased to prevent clearing for laydown.

6.2 Mitigation

Where clearing is required, the following mitigation measures will be implemented:

- All clearing of a temporary nature will be rehabilitated upon completion of construction;
- Pole placement will avoid drainage lines, where possible, minimising impacts to riparian and mudflat vegetation;
- The construction of access tracks within the tidal inlet between Hearson Cove and King Bay, will be avoided as far as practicable, to minimise impacts to vegetation, flora and fauna habitat within this area;
- Pole locations will utilise disturbed areas associated with the Burrup Peninsula Road and Hearson Cove Road Improvements project (under construction by Main Roads), reducing the amount of new clearing required for access tracks;
- Dust, noise and vibration management measures (as detailed in the CEMP) will be implemented during construction; and
- Implementation of the management measures in the CEMP (Attachment A) to minimise risks to vegetation and flora, and to provide monitoring during construction.

6.3 Management

As mentioned in Section 1.2, a CEMP has been developed for the Project which lists the specific mitigation and management measures to be applied during construction of the Project (see Attachment A).

6.4 Restoration of Cleared Areas

At the completion of the construction phase, any clearing required for temporary purposes, and not required for ongoing operations, will be rehabilitated (refer to the CEMP, Attachment A). A total of 2.90 ha of native vegetation is anticipated to be temporarily cleared and will be rehabilitated.

7 Stakeholder Engagement

The key stakeholders consulted for the Proposal are provided in Table 4.

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Table 4 Key project stakeholders

Stakeholder	Date	Type of consultation	Stakeholder comments/issue/topic raised	Stakeholder response
Murujuga Aboriginal Corporation (MAC)	August 2020 - present	In person meetings Emails Sharing of concept design information Aboriginal Heritage surveys	Introduction and updates to the proposed common user infrastructure transmission from Burrup to Maitland, including overviews of high, low and medium case transmission options. Several face-to-face meetings with the CEO as well as email correspondence and supply of concept design drawings to inform them of the Proposal details.	Participation in archaeological and ethnographical Aboriginal Heritage reports including recommendations for Horizon Power on how to progress works.
Ngarluma Aboriginal Corporation (NAC)	August 2020 - present	In person meetings MS Teams meetings Emails Sharing of concept design information Aboriginal Heritage surveys	Introduction and updates to the proposed common user infrastructure transmission from Burrup to Maitland, including overviews of high, low and medium case transmission options. Several face-to-face meetings with the CEO as well as email correspondence and supply of concept design drawings to inform them of the Proposal details.	Participation in archaeological and ethnographical Aboriginal Heritage reports including recommendations for Horizon Power on how to progress works.
JTSI	November 2020 - present	In person meetings MS Teams meetings Emails Sharing of concept design information	Introduction, updates, and strategy discussions related to the proposed common user infrastructure transmission from Burrup to Maitland, including overviews of high, low and medium case transmission options. Focused discussions on preferred routes, land tenure and land access items. Focused discussions on sizing of the transmission infrastructure and prospective proponents.	General in principle support for common user transmission infrastructure being provided to the Burrup SIA.
Rio Tinto (covers Hamersley Iron)	March 2021 - present	Emails Sharing of concept design information Notice of Entry letter General letter Pilbara Advisory Committee meetings	Introduction and updates to the proposed common user infrastructure transmission from Burrup to Maitland, including overviews of high, low and medium case transmission options. Discussed overall project, geotechnical investigations, and Native Vegetation Clearing Permit (NVCP). Focused discussions on 220 kV line crossings and rail crossing requirements. Issued notice of entry letter for geotechnical investigations. Focused discussions on all technical and regulatory impacts of the Proposal through structured Pilbara Advisory Committee meetings.	General in principle support for common user transmission infrastructure being provided to the Burrup SIA subject to no negative impacts being transposed to the NWIS. Sharing of technical requirements for line crossings.

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Stakeholder	Date	Type of consultation	Stakeholder comments/issue/topic raised	Stakeholder response
Yara	April 2021 - present	General Letter Meetings MS Teams meetings Email	Introduction and updates related to the proposed common user infrastructure transmission from Burrup to Maitland, including overviews of high, low and medium case transmission options.	General in principle support for common user transmission infrastructure being provided to the Burrup SIA.
Woodside	May 2021 - present	Emails Sharing of concept design information Notice of Entry letter General letter Pilbara Advisory Committee meetings Technical modelling	Introduction and updates to the proposed common user infrastructure transmission from Burrup to Maitland, including overviews of high, low and medium case transmission options. Progressing of NWIS connection studies.	General in principle support for common user transmission infrastructure being provided to the Burrup SIA and Maitland SIA for connection of their Pluto LNG facility and proposed solar farm facility at to the NWIS. Progressing of NWIS connection application process under the low case option.
Development WA	March 2022 - present	MS Teams meetings Emails Sharing of concept design information Notice of Entry letter General letter Online workshop	Introduction, updates, and strategy discussions related to the proposed common user infrastructure transmission from Burrup to Maitland, including overviews of high, low and medium case transmission options. Focus discussions on optimising line routes to avoid impact to Aboriginal Heritage sites and coordinate with existing and proposed plans for developments. Focus discussions on land tenure and land access items. Participation in the Burrup to Maitland multi-user corridor assessment study being performed by GHD for Development WA.	General in principle support for common user transmission infrastructure being provided to the Burrup SIA subject to infrastructure considering future developments.
Department of Premier and Cabinet (DPC)	February 2022	MS Teams meetings	Introduction, updates, and strategy discussions related to the proposed common user infrastructure transmission from Burrup to Maitland, including overviews of high, low and medium case transmission options. Focused discussions on Maitland land tenure and access items.	General in principle support for common user transmission infrastructure being provided to the Burrup SIA.
Department of Land and Heritage	March 2022 - present	Meetings Email Notice of Entry letter	Focused discussions on land tenure and land access items for the proposed common user infrastructure transmission from Burrup to Maitland.	General in principle support for common user transmission infrastructure being provided to the Burrup SIA subject to minimising disturbance, working with existing infrastructure operators and ensuring all safety considerations are met.

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Stakeholder	Date	Type of consultation	Stakeholder comments/issue/topic raised	Stakeholder response
Main Roads WA	January 2022 - present	Meetings MS Teams meetings Emails Sharing of concept design information	Introduction and updates to the proposed common user infrastructure transmission from Burrup to Maitland, including overviews of high, low and medium case transmission options. Focus discussions on road crossings and coordination in Hearson Cove Road realignment.	General in principle support for common user transmission infrastructure being provided to the Burrup SIA subject to 20m high load route being achieved and coordination with Hearson' Cove Road realignment being achieved.
Pilbara ISO	May 2022 - present	Meetings MS Teams meetings Emails Sharing of concept design information Workshops	Introduction and updates to the proposed common user infrastructure transmission from Burrup to Maitland. Focus discussions on technical matters.	General in principle support for common user transmission infrastructure being provided to the Burrup SIA subject to no negative impacts being transposed to the NWIS.
Epic Energy and BHP Minerals	August 2022	Notice of Entry letter	Notifying access required to progress investigation works.	None.
Karratha City	October 2022 - present	Meetings Sharing of concept design information	Introduction and updates to the proposed common user infrastructure transmission from Burrup to Maitland, including overviews of high, low and medium case transmission options.	General in principle support for common user transmission infrastructure to support renewables development on the NWIS.
Water Corporation	October 2022 - present	Meetings MS Teams meetings Emails Sharing of concept design information	Introduction and updates to the proposed common user infrastructure transmission from Burrup to Maitland, including overviews of high, low and medium case transmission options.	General in principle support for common user transmission infrastructure being provided to the Burrup SIA subject to safety considerations on adjacent water pipelines being properly considered and addressed.
Australia Gas Infrastructure Group	October 2022 - present	Meetings Emails Sharing of concept design information	Introduction and updates to the proposed common user infrastructure transmission from Burrup to Maitland, including overviews of high, low and medium case transmission options.	General in principle support for common user transmission infrastructure being provided to the Burrup SIA subject to safety considerations on adjacent gas pipelines being properly considered and addressed.
DWER	October 2022 - present	MS Teams meeting	Pre-Referral Meeting Dampier to Burrup 132 kV Line.	Supportive of Horizon Power approach to submitting referral.

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Stakeholder	Date	Type of consultation	Stakeholder comments/issue/topic raised	Stakeholder response
Community	Nov 2022	West Pilbara Community Information Session	Update on proposed common user transmission infrastructure from Maitland to Burrup and renewables on the NWIS.	General in principle support of increasing renewables on the NWIS.

8 Assessment Against the 10 Clearing Principles

An assessment against the 10 Clearing Principles outlined by DWER (2014) has been undertaken to support the NVCP application for the Project, as presented in Table 5. The assessment found that the proposed clearing of native vegetation for the Project is 'likely to be at variance' with principles (b) and (f); 'unlikely to be at variance' with principles (a), (c), (g), (h), and (j); and not at variance with principles (d), (e), (i).

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Table 5 Assessment Against the 10 Clearing Principles

Principle	Assessment	Outcome
(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.	The proposed vegetation clearing area associated with the Project is relatively small in extent (up to 14.40 ha total across the 85.54 ha DE) and depending on the specific location of the infrastructure, could comprise of up to thirteen vegetation units (excluding cleared) which are found across the DE. These vegetation types were recorded during the field surveys undertaken, and are characterized by conditions ranging from 'Very Good' to 'Completely Degraded'. In order to calculate the extent of each vegetation type to be cleared, an indicative development footprint has been used. However, as the detailed design is ongoing, these figures are indicative and subject to change. The total clearing will be no more than 14.40 ha, which is a conservative worst case estimate greater than the indicative extent detailed below, allowing for currently unknown constraints. In general, the DE vegetation and habitats are similar to those found across the wider survey areas associated with the comprehensive surveys (VLA, 2019 and GHD, 2019). This confirms that the DE comprises a similar level of biological diversity compared to the surrounding area. Three DBCA-listed Priority species were recorded within the DE, as reported in Table 3, *Rhynchosia bungarensis* (Priority 4); *T. supranitifolia* (Priority 3); and *Vigna tridiophila* (Priority 3). There are 84 populations of *Rhynchosia bungarensis* reported on FloraBase across WA (236 individuals), with records showing individuals to be occasional to common. The Project has been designed to minimise impacts to *R. bungarensis* individuals as far as possible. The surveys (VLA 2019 & GHD 2019, 2020a & 2022) recorded a total of 134 individuals of *R. bungarensis* within the wider survey areas (which contributes to the FloraBase population estimate). Clearing of up to six individuals for the Proposal represents 4.5% of the total number of individuals recorded across the survey areas and 2.5% of the estimated total number of individuals in the state. Clearing of *R. bungarensis* individuals is not expected to significantly impact the population of *R. bungarensis* at a local or regional scale, given the relative abundance of records of the species across WA and the likely underrepresentation of individual counts from FloraBase. As the design develops, impacts to *R. bungarensis* will be further reduced and avoided where possible, and avoidance areas have been developed to minimise impacts. There are 54 FloraBase records of *T. supranitifolia* within WA, with sparse records of plants at each location. The total number of individuals of *T. supranitifolia* is estimated to be 223. The surveys (VLA 2019 & GHD 2019, 2020a & 2022) recorded a total of 151 individuals of *T. supranitifolia* within the wider survey areas. Clearing of up to 19 individuals for the Project represents 12.6% of the total number of individuals recorded across the survey areas and 8.5% of the estimated total number of individuals. Clearing of *T. supranitifolia* individuals is not expected to significantly impact the population of *T. supranitifolia* at a local or regional scale, given the relative abundance of records of the species across WA and the likely underrepresentation of individual counts from FloraBase. The Project has been designed to minimise impacts to *T. supranitifolia* individual and avoidance areas have been developed to minimise impacts. The Proposal will avoid impacts to *Vigna tridiophila* individuals through inclusion within the avoidance areas. The fauna habitats within the DE are part of a contiguous, largely intact area of remnant vegetation present on the Burrup Peninsula. Land within the Burrup SIA has been subject to clearing, but this clearing is restricted to designated industrial sites and connecting service corridors, leaving much of the remnant vegetation intact in the local area. The ephemeral floodplain/ drainage lines (VT04) within the DE drain towards the coast and the plain areas provide corridors linking the coast to the surrounding hills. Overall, the habitats within the DE are largely contiguous through the local area. The Project will result in the clearing of up to 14.40 ha of native vegetation (including up to 2.90 ha of temporary clearing), representing a possible thirteen VTs. Two VTs, VT03 and EvAbTa (totalling 6.59 ha) within the DE are considered to represent riparian vegetation. These VTs are associated with drainage lines which dissect the plain and support *Eucalyptus victrix* or *Corymbia hamersleyana* and *Acacia coriacea*	Unlikely to be at variance.

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<table>
<tr><th>Principle</th><th>Assessment</th><th>Outcome</th></tr>
<tr><td></td><td>species. The clearing of up to 2.50 ha of riparian vegetation is conservative (worst case to allow for currently unknown constraints) and clearing required for current indicative design is approximately 0.9 ha. Horizon Power will avoid placing poles and/or pole pads within drainage lines, therefore limiting clearing to the mapped edges of these VTs. The clearing of riparian vegetation required for the Project is not considered to be significant, nor will the clearing significantly impact the function of these drainage lines.

Three VTs (Tspp, VT04 and VT05, totalling 8.99 ha) are considered to represent locally restricted vegetation associated with the tidal inlet between Hearson Cove and King Bay. The clearing of up to 1.50 ha of this vegetation is conservative (worst case to allow for currently unknown constraints) and clearing required for current indicative design is approximately 1.09 ha. However, it is noted that areas of this vegetation within the DE have recently been impacted by the Burrup Peninsula Road Infrastructure Upgrades project carried out by Main Roads WA (approximately 0.7 ha has been cleared in the DE since the biological survey was undertaken). Horizon Power will avoid placing access tracks within these VTs where possible, and instead intends to install and access the poles directly from Burrup Road. There is approximately 100 ha of the Saline Inlet and Supra-tidal Flats community known to occur on the Burrup Peninsula, of which 56% occurs within the Murujuga National Park. The Proposal will result in the clearing of up to 1.50 ha of this vegetation, which is approximately 1.5% of the local extent of this vegetation type.

With the exception of VT03, EvAbTa, Tspp, VT04 and VT05, the vegetation present within the DE is not considered locally restricted and is represented in similar condition locally within Murujuga National Park. The majority of the vegetation within the DE is VT06. There is 2.1 ha of vegetation representative of the Priority 1 ‘Burrup Peninsula Rock Pile Communities’ PEC within the DE. This vegetation ranges from Good to Excellent condition, with the majority (1.85 ha, 84%) being in Very Good or Excellent condition. No clearing of this PEC is proposed, and the associated vegetation types are included in the ‘avoidance areas’.

It should be noted that the northern quarter of the DE is highly constrained by Aboriginal cultural heritage and environmental values (namely the Priority 1 ‘Burrup Peninsula rock pile communities’ PEC). In the unlikely event that construction of the Proposal is constrained by Aboriginal cultural heritage (i.e. an unexpected find during initial ground disturbing works) within this area, minor impacts to the Burrup Peninsula rock pile communities PEC may be required. This clearing (if required) will be kept to the minimum extent practicable for constructability and will be approved by Horizon Power’s Manager Sustainability prior to undertaking clearing activities. It is noted that the DE has been surveyed for Aboriginal cultural heritage and therefore the clearing of the Priority 1 PEC is only to be implemented in the event of an unexpected find, which is considered to be unlikely given the extent of previous surveys undertaken. Murujuga Aboriginal Corporation (MAC) monitors will also be present during construction.

With implementation of the ‘avoidance areas’ identified on Figure 1, direct and indirect impacts to flora and vegetation associated with the Project are not expected to be significant. These impacts can be managed through the proposed mitigation and management measures, and the implementation of the CEMP prepared for the Project (Attachment A).

The Project is not likely to be at variance with this principle.</td><td></td></tr>
<tr><td>(b) Native vegetation should not be cleared if it comprises the whole or part of, or is necessary for the maintenance of, a significant habitat for</td><td>Five fauna habitat types (not including cleared and disturbed areas) have been mapped across a total of 78.24 ha. These fauna habitats align with the vegetation types identified above, and are associated with the rocky hills, grasslands, drainage lines and mudflats that are present within the DE.
<table>
<tr><th>Fauna habitat types</th><th>Fauna habitat value</th><th>Extent within the DE (ha)</th></tr>
<tr><td>Hummock Grassland on Rocky Plain</td><td>Moderate to High value</td><td>9.48</td></tr>
</table></td><td>Likely to be at variance.</td></tr>
</table>

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<table>
<tr><th>Principle</th><th>Assessment</th><th>Outcome</th></tr>
<tr><td>fauna indigenous Western Australia.</td><td>
<table>
<tr><td>Hummock Grassland on Low Rocky Hills</td><td>Moderate to High value</td><td>10.89</td></tr>
<tr><td>Minor Drainage</td><td>High value</td><td>6.54</td></tr>
<tr><td>Mudflat with Tidal Inundation, Mangroves and Supportive Scattered Samphire</td><td>High value</td><td>7.76</td></tr>
<tr><td>Rocky Hills with Exposed Boulder Piles</td><td>High value</td><td>43.57</td></tr>
<tr><td>Cleared and Disturbed</td><td>N/A</td><td>7.3</td></tr>
<tr><td>Total</td><td></td><td>85.54</td></tr>
</table>
A number of significant fauna species are associated with these habitats, identified in Table 3, and the likelihood of occurrence within the DE has been detailed in Appendix C.

The Project will result in the loss of up to 14.40 ha of native vegetation representing five habitat types (including up to 2.90 ha of temporary clearing which will be rehabilitated following completion of construction). The ‘Rocky Hills with Exposed Boulder Piles’ habitat type is significant fauna habitat, as species are likely to persist in the extensive crevices within the boulders. In addition, this habitat type is considered critical habitat for the Northern Quoll. The Project will avoid impacts to the rock piles as far as possible (refer to Section 6.1 for avoidance) however will result in the clearing of up to 14.40 ha of this habitat type (although likely to be much less, in the region of 3 ha).

The loss of up to 14.4 ha of habitat critical to the survival of the Northern Quoll could have a significant impact on local Northern Quoll populations. FMG (2018) identified 8,224 ha of potential Northern Quoll denning habitat in the region of which 299.3 ha (3.63%) was planned to be removed for the Solomon and Eliana mines and associated rail line, and 4 ha removed as part of the Munawara Red Dog Highway project. Based on this, the Proposed Action will result in the removal of a further 0.18% of the total denning habitat in the region as mapped by FMG (2018). This means that over 96% of the suitable denning habitat mapped by FMG (2018) would remain. Given this, the loss of 14.4 ha is unlikely to be significant given the availability of locally available denning habitat and suitable habitat for the species more broadly in the Pilbara (estimated over 8 million ha of suitable habitat is present in the Pilbara region).

The ‘Minor Drainage’ and ‘Mudflat with Tidal Inundation, Mangroves and Supportive Scattered Samphire’ fauna habitat types are also considered significant habitat and may be utilised by Migratory birds and other significant fauna species. The Proposal has been designed to avoid impacts to these habitat types as far as possible. Where possible, no poles will be placed within drainage lines and the construction of access tracks within the tidal inlet between Hearson Cove and King Bay will be avoided as far as practicable.

Fauna habitats present within the DE are well represented outside of the DE within the surrounding area. The vegetation, landform and habitat values (i.e. *Triodia* hummock grassland) are typical of VA 117 (which is described as Hummock grasslands, grass steppe; soft spinifex). The Project will result in the reduction of approximately 0.05% of mapped VA 117 at a local scale (City of Karratha) and approximately 0.002% at a regional scale (Pilbara IBRA bioregion). The proposed clearing will not reduce the current extent of VA 117 to less than 77% of its pre-European extent at a local scale and 90% at a regional scale, and therefore will not significantly reduce the extent of VA 117 at any scale.

The design of the Project has, and will continue to be, refined to minimise the extent of fauna habitat clearing as much as possible. Only minor clearing will be required within the drainage and mudflats habitat types. It is considered that the limited extent of clearing is unlikely to substantially impact fauna habitat.</td><td></td></tr>
</table>

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Principle	Assessment	Outcome
	Although the Project covers a linear area, given the limited extent of clearing proposed and the nature of the overhead transmission line, it is not anticipated that the clearing associated with the Project would result in the loss or reduction of an ecological linkage as the habitats are generally well represented locally and the infrastructure should not prevent the movement of fauna. Given the relatively small amount of clearance required, direct and indirect impacts to terrestrial fauna associated with the vegetation clearing required for the Project are not expected to be significant. It is anticipated these impacts can be managed through the proposed mitigation and management measures, and the implementation of the CEMP prepared for the Project (Attachment B). However, as the 'Rocky Hills with Exposed Boulder Piles' habitat type is critical habitat for the Northern Quoll, and will require up to 14.40 ha of clearing (likely to be much less, in the region of 3 ha), the Project is likely to be at variance with this principle. It is noted however that the 'Rocky Hills with Exposed Boulder Piles' habitat will continue to be well represented outside the DE.	
(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.	No BC Act listed Threatened flora taxa were recorded within the DE during the VLA (2019) survey or the GHD (2019, 2020a & 2022) surveys. A likelihood of occurrence assessment (adapted from the VLA [2019] and GHD [2019 & 2020a] surveys) concluded that no additional significant flora taxa were likely or have the potential to occur within the DE. The likelihood of occurrence assessment took into account previous records, habitat requirements, seasonal variation, efficacy of the survey, intensity of the survey, flowering times and the cryptic nature of the species. As the Proposal will not impact any Threatened flora taxa listed under the BC Act, the proposed clearing is not at variance with this Principle.	Not at variance.
(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.	An updated desktop search did not identify any Threatened ecological communities within the development, which was confirmed by the surveys (GHD 2020a, 2022). PECs are covered under Principle (a). As such the proposed clearing is not at variance with this Principle.	Not at variance.
(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.	As detailed in Table 3, the DE is within Vegetation Association 117 (Abydos Plain - Roebourne). The Project will result in the reduction of up to 0.05% of the current mapped extent of VA 117 at a local scale (City of Karratha) and up to 0.002% at a regional scale (Pilbara IBRA bioregion). The proposed clearing will not reduce the current extent of VA 117 to less than 77% of its pre-European extent at a local scale and 96% at a regional scale. The National Objectives and Targets for Biodiversity Conservation recognise that the retention of 30% or more of the pre-clearing extent of each ecological community is necessary if Australia's biological diversity is to be protected (Commonwealth of Australia, 2001) except in constrained areas (Perth & Peel) where 10% representation should be maintained. Given the high percentage of the pre-European vegetation extent remaining for VA 117, the NVCP application area is not considered to be a significant remnant of native vegetation. Therefore, the proposed reduction in the extent of VA 117 as a result of the Project is not considered significant at any scale. The Project will result in the reduction of up to 0.01% of the vegetation within the mapped extent of the Granitic Land System and up to 0.03% of the Littoral Land System. The Proposal will not reduce the extent of these land systems below 90% at a regional scale. The reduction in the extent of the Granitic and/or Littoral Land Systems as a result of the Proposal is not considered significant. Therefore, the proposed clearing is not at variance to this Principle.	Not at variance.

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Principle	Assessment	Outcome
(f) Native vegetation should not be cleared if it is growing in or in association with a watercourse or wetland.	A search of publicly available data indicates no significant wetlands (Ramsar wetlands or Nationally Important Wetlands) are located within 100 metres of the DE. The Burrup Peninsula has limited surface water. No permanent water bodies are located within the DE, however numerous intermittent drainage lines are present. The Project is located in close proximity to the tidal inlet between Hearson Cove and King Bay, and VT04 is associated with the tidal inlet. The Project will clear a maximum of 1.50 ha of this vegetation (likely to be less, approximately 0.96 ha has been calculated as the indicative clearing). However, it is noted that areas of this vegetation within the DE have recently been impacted by the Burrup Peninsula Road Infrastructure Upgrades project carried out by Main Roads WA (approximately 0.7 ha has been cleared in the DE since the biological survey was undertaken), and the Perdaman Urea Project in the wider area. Additionally, up to 2.50 ha (likely to be less, approximately 0.90 ha calculated as indicative clearing) of VT03 is expected to be disturbed, which is a riparian vegetation associated with a minor drainage line. Vegetation communities within drainage lines may be partially reliant on the intermittent, ephemeral flows through the drainage lines, which may recharge shallow aquifers in the Quaternary alluvium and provide a water source to sustain deeper-rooted vegetation during the year. Disruption to environmental flows has the potential to reduce the recharge to aquifers and result in impacts to condition or survival of deeper-rooted vegetation. Vegetation communities within drainage lines are also vulnerable to impacts from erosion and sediment deposition from the alteration to hydrological flows. The poles and pole pads required for the Project are not proposed to be placed within drainage lines, reducing impacts to environmental flows, sedimentation and erosion within the DE. Additional infrastructure required for the Project, such as access tracks, will be positioned to avoid direct impact (where practicable) to drainage lines and the associated surface water flows. Access tracks required for the Project have been reduced to a nominal 4 m trafficable width, which presents limited obstruction or concentration of overland flow. Due to the lack of substantial alteration to drainage patterns, the Project is not expected to reduce environmental flows in drainage lines running through the DE. Additional management measures to reduce impacts to hydrological flows resulting from the Proposal are included within the CEMP (Attachment A). Although the Project is likely to be at variance with this principle, overall construction and operational impacts to drainage lines from the alteration of hydrological flows are expected to be incidental and/or localised and not expected to result in significant impacts.	Likely to be at variance.
(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	The DE is located within the North-Pilbara Granite-Greenstone Terrane Hydrogeological province and the Pilbara - Fractured aquifer. The Granit-Greenstone Terrane Hydrogeological Province has shallow soils, relatively high drainage density and groundwater resources limited to alluvial aquifers and fracture zones in greenstones (CSIRO, 2015). The surrounding area (Burrup Peninsula) is characterized by a semi-arid climate with elevated temperatures and scarce rainfall, mostly influenced by tropical cyclones and monsoons during the summer. The DE is also primarily located in areas of the Granitic land system with soils of diverse permeability and not susceptible to erosion. A small portion of the project is within the Littoral Land System which is susceptible to wind erosion if plant cover is lost by fire or other disturbances (DPIRD, 2004). Permanent clearing of up to 11.50 ha of native vegetation and temporary clearing of up to 2.90 ha of native vegetation within the Granitic and Littoral land systems is proposed. The Project will result in the reduction of up to 0.01% of the vegetation within the mapped extent of the Granitic Land System and up to 0.03% of the Littoral Land System. Acid Sulfate Soil (ASS) risk mapping of the DE indicates that the soils have a 'high to extremely low' probability of ASS occurrence. Only a small section of the DE (approximately 11.6 ha) has a high to moderate probability of ASS occurrence, indicating that there is a high risk of ASS occurring within 3 m of the natural soil surface. Vegetation clearing in itself is unlikely to expose or mobilise ASS. There are some potential impacts to soil quality as a result of clearing associated with the Project. These include:	Unlikely to be at variance.

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Principle	Assessment	Outcome
	– Soil erosion from clearing and vehicle/machinery movement; – Soil contamination from accidental release of chemicals and/or hydrocarbons (i.e. leaks, spills). Since minor quantities of chemicals and hydrocarbons will be handled and/or temporarily stored through construction, impacts resulting in the event of accidental release are expected to be negligible; and – Soil contamination from accidental release of waste. To reduce the potential for any impact which could result in land degradation, the following measures will be implemented during clearing associated with the Project: – Implementation of CEMP controls to minimise erosion and potential mobilization of unstabilised sediments with stormwater runoff; and – Implementation of CEMP to prevent release of chemicals, hydrocarbons and waste, and prescribe corrective actions in the event of accidental releases. The clearing associated with the Project is not likely to result in appreciable land or soil degradation given the flexibility to adjust Project design to minimise impacts, the short-term nature of clearing activities, the limited quantities of contaminants handled on site, and the implementation of listed controls in accordance with the mitigation hierarchy. Therefore, overall, the Project is not likely to be at variance with this principle.	
(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.	The Murujuga National Park is located within close proximity, approximately 100 m north and 180 m east, of the DE (DBCA, 2023) (Figure 2). The closest Crown Land Lands of Interest is 22km from the southern portion of the project (DBCA, 2023b). There are no other conservation areas in proximity to the DE. The Murujuga National Park hosts the largest concentration of ancient rock art in the world and has an area of 5,134 hectares. Primary geographical features and ecosystems found within the park consist of sea cliffs, mudflats, sandy and rock shores, narrow valleys, rocky outcrops, and hills and mangroves. The prevailing vegetation in the region is composed mainly of 'hummock' grasslands (*Triodia pungens*), accompanied by a restricted occurrence of 'vegetation communities' (Murujuga, 2023). The DE and the Park are separated by Village Road, Yara Pilbara, Hearson Cove Road and Burrup Road, therefore since it is an area already cleared, the DE does not represent an ecological link between vegetation. The Project has been designed in consultation with traditional owners from MAC and NAC, and consultant archaeologists and anthropologists. The location and extent of Aboriginal cultural heritage within the DE has been confirmed by surveys (CBG 2020, Scarp 2022, and Acacia). Given there is no clearing proposed within the Murujuga National Park, no impacts are anticipated on the environmental values associated with this National Park. Potential indirect impacts related to dust and noise will be appropriately managed through adherence to the mitigation measures outlined in the CEMP (Attachment A). These may include dampening down of any excessive dust generating construction activities and implementation of standard construction noise management measures. Based on the impacts identified, the Project is not expected to have an impact on environmental values of any adjacent or nearby conservation area. As such, the Project is not likely to be at variance with this principle.	Unlikely to be at variance.
(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to	There are no Wetlands (Ramsar wetlands or Nationally Important Wetlands) (DBCA,2018; DBCA, 2017) or Waterways Conservation Act 1976 (DWER, 2018) within the Development Envelop or surrounding area.	Not at variance.

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Principle	Assessment	Outcome
cause deterioration in the quality of surface or underground water.	The Burrup Peninsula has limited surface water. No permanent water bodies are located within the DE, however numerous intermitted drainage lines are present. These drainage lines are ephemeral, with highly variable flows characterised by short periods of high-water flow associated with high intensity weather events such as tropical cyclones. The Project is located in close proximity to the tidal inlet between Hearson Cove and King Bay. This area is characterised by saline flats that experience tidal inundation. The DE does not overlap public drinking water source areas. The closest area is the Roebourne Water Reserve, approximately 44km to the southeast of the Project. The Project is located within the North-Pilbara Granite-Greenstone Terrane Hydrogeological province and the Pilbara -Fractured aquifer. According to the Water Information Reporting (DWER, 2023), there is only one registered groundwater bore (Site Ref. 70970061) within the Burrup Peninsula, however, there is no data available. Clearing associated with the Project in drainage lines has the potential to interrupt natural drainage pathways. Clearing associated with the Project may have a minor and temporary impact on the quality of inland waters as a result of sediments and/or contaminants being transported with stormwater runoff. Contamination of soils and subsequent mobilisation to surface waters may result from accidental release of chemicals and/or hydrocarbons (i.e. leaks, spills) during clearing. Since minor quantities of chemicals and hydrocarbons will be handled and/or temporarily stored through construction, impacts resulting in the event of accidental release are expected to be negligible. It is not expected that groundwater would be encountered when clearing. If groundwater is encountered, the proposed mitigation (Attachment A) is considered adequate to manage temporary impacts. Clearing will not remove deep rooted vegetation and is not of a large enough scale to effect the local groundwater levels. Acid Sulfate Soil (ASS) risk mapping of the DE indicates that the soils have a 'high to extremely low' probability of ASS occurrence. Only a small section of the DE (approximately 11.6 ha) has a high probability of ASS occurrence, indicating that there is a high risk of ASS occurring within 3 m of the natural soil surface. Areas of high ASS risk will be avoided as far as possible. Given the lack of significant water courses within the DE and surrounding area, and the limited clearing proposed over a geographically dispersed area, it is not anticipated the Project would exacerbate the risk of flooding or waterlogging. The following measures will be implemented to mitigate impacts to surface or underground water: – The Project infrastructure (and associated clearing), including poles and access tracks, will be positioned to avoid direct impact to drainage lines and the associated surface water flows; and – Implementation of CEMP to prevent chemical/ hydrocarbon leaks and spills and prescribe corrective actions in the event of accidental releases. The Project will not cause significant impacts to surface and groundwater given the mitigation approach (avoidance first) and short term, minor nature of clearing and construction activities. Impacts to groundwater are not anticipated, however, if encountered dewatering activities will be of a minor and temporary nature. Therefore, the Project is not at variance with this Principle.	
(j) Native vegetation should not be cleared if the clearing of the vegetation is likely to	The Burrup Peninsula is characterized by a semi-arid climate with elevated temperatures throughout the year and scarce rainfall, mostly occurring in the late summer months influenced by tropical cyclones and monsoons. According to the Bureau of Meteorology (2023) the mean rainfall, over the last 50 years, has had an estimated annual rainfall of 290.5mm, with the months from December to July being the most representative (with a maximum of 76.4mm in February and a minimum of 13.7mm in April) compared to the dry season (ranging from 0.4mm in October to 4.0mm in August).	Unlikely to be at variance.

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Principle	Assessment	Outcome
cause, or exacerbate, the intensity of flooding.	The DE overlaps the Littoral Land System and Granitic Land System. The granitic land system is composed of stony soils (203), red shallow sands (423), red loamy earth (544) and shallow riverbed soils (705) which have diverse permeability characteristics. The area within the DE has a major association with sandy loam on rocky slopes with frequent basalt outcropping (VT06) and rocky sandy loam on minor drainage lines (VT03). The area within the Littoral Land System has tidal soils (104) characterized by very slow permeability and vegetation associated with tidal flats (VT04). Although the DE has areas associated with very slow permeability characteristics and adjacent or within drainage lines and tidal flats, the most numerous permanent elements of the project (40 poles and cleared poles access) are designed to be spaced out and with small areas of clearing required (40m x20m) throughout the DE, and along the 4m wide access track. Given the lack of significant water courses within the DE and surrounding area, and the limited clearing proposed over a geographically dispersed area, it is not anticipated the Project would exacerbate the risk of flooding or waterlogging with regard to rivers, or have any discernible impact on coastal flooding. In addition, only relatively small areas of vegetation will be cleared which will not impact the overall surface water flow paths and velocities. As such, the Project is not likely to be at variance with this principle.	

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Murujuga National Park

Village Rd

King Bay Rd

Griffin Rd

BURRUP

Burrup Rd

Hearson Cove Rd

Legend

Threatened and Priority Fauna
- Threatened - Endangered
- Threatened - Vulnerable

Significant Flora
- **Passiflora foetida*
- *Rhynchosia bungarensis*
- *Terminalia supranitifolia*

- Major Road
- Minor Road

Creeks and River Drainage
- Other
- Development Envelope
- Avoidance Areas

- Vegetation types associated with the Burrup Peninsula rock pile communities (Priority 1) PEC

Threatened Ecological Communities
- Priority

Legislated Lands and Waters
- National Park

0 50 100 200
Meters

N

Scale: 1:6,000 (A3 Print)

Project Name: Burrup Common User Transmission Infrastructure – NVCP
Projection: GDA2020 MGA Zone 50
Sources: Jacobs - Development Envelope; Landgate - Roads, WA Now accessed September 2023
Map Produced: 9/18/2023.
Project Number: IS472900
Rev B

Jacobs
JACOBS, Mia Yellagonga Tower 2, Level 5, 5 Spring Street, (GPO Box H615) | Perth WA 6000 | Australia
Tel: +61 8 9469 4400 Fax: +61 8 9469 4488

Figure 2 - Environmental Constraints

Burrup Rd

BURRUP

Murujuga National Park

DAMPIER ARCHIPELAGO
DAMPIER
ROEBOURNE
GNOOREA
MAITLAND
COOYA POOYA
MARDIE

Legend

Threatened and Priority Fauna
- Threatened - Vulnerable
- Specially Protected - Migratory Bird
- Priority Fauna

Significant Flora
- *Rhynchosia bungarensis*
- *Terminalia supranitifolia*
- *Vigna triodiophila*
- Major Road
- Minor Road

Creeks and River Drainage
- Other
- Development Envelope

- No-Go Zones
- Vegetation types associated with the Burrup Peninsula rock pile communities (Priority 1) PEC

Legislated Lands and Waters
- National Park

0 50 100 200
Meters

N

Scale: 1:6,000 (A3 Print)

Project Name: Burrup Common User Transmission Infrastructure – NVCP
Projection: GDA2020 MGA Zone 50
Sources: Jacobs - Development Envelope; Landgate - Roads, WA Now accessed September 2023
Map Produced: 9/18/2023.
Project Number: IS472900
Rev B

Jacobs
JACOBS, Mia Yellagonga Tower 2, Level 5, 5 Spring Street, (GPO Box H615) | Perth WA 6000 | Australia
Tel: +61 8 9469 4400 Fax: +61 8 9469 4488

Figure 2 - Environmental Constraints

Burrup Rd

BURRUP

Murujuga National Park

DAMPIER ARCHIPELAGO
DAMPIER
ROEBOURNE
GNOOREA
MAITLAND
COOYA POOYA
MARDIE

Legend

Threatened and Priority Flora (DBCA)
- Priority 3

Significant Flora
- *Rhynchosia bungarensis*
- *Terminalia supranitifolia*
- *Vigna triodiophila*

- Major Road

Creeks and River Drainage
- Other
- Development Envelope
- No-Go Zones

Vegetation types associated with the Burrup Peninsula rock pile communities (Priority 1) PEC

Legislated Lands and Waters
- National Park

0 50 100 200
Meters

N

Scale: 1:6,000 (A3 Print)

Project Name: Burrup Common User Transmission Infrastructure – NVCP
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Figure 2 - Environmental Constraints

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BURRUP

Burrup Rd

Dampier Rd

DAMPIER

DAMPIER ARCHIPELAGO
DAMPIER
ROEBOURNE
GNOOREA
MAITLAND
COOYA POOYA
MARDIE

Legend

Significant Flora
- *Rhynchosia bungarensis*
- *Terminalia supranitifolia*
- *Vigna triodiophila*
- Major Road
- Minor Road

Creeks and River Drainage
- Other
- Development Envelope
- No-Go Zones

Vegetation types associated with the Burrup Peninsula rock pile communities (Priority 1) PEC

Legislated Lands and Waters
- National Park

0 50 100 200
Meters

N

Scale: 1:6,000 (A3 Print)

Project Name: Burrup Common User Transmission Infrastructure – NVCP
Projection: GDA2020 MGA Zone 50
Sources: Jacobs - Development Envelope; Landgate - Roads, WA Now accessed September 2023
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Figure 2 - Environmental Constraints

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9 Other matters

9.1 Land Planning

The current tenure of the DE is provided in Table 1. The DE covers numerous parcels of land, with the majority being Crown Land (23.7%), followed by Freehold Land (15.3%). Approximately 11.6% of the DE is Reserve Land and 7.9% consists of land reserved as Road. Leased land covers approximately 5.1% of the DE.

As an 'energy operator', Horizon Power has certain rights under Sections 46 and 49 of the *Energy Operators (Powers) Act* 1979 which allow it to access and use land for the purpose of constructing, maintaining and operating electricity infrastructure. Horizon Power will utilise these powers for the transmission line portion of the works. A management order is being obtained for the Burrup substation.

9.2 Other approvals

Other approvals potentially relevant to this Project are detailed below.

Table 6 Other Approvals

Other approvals	Assessment
Referral to Environmental Protection Authority	Horizon Power referred the Project to the WA Environmental Protection Authority (EPA) under Part IV (Section 38) of the *Environmental Protection Act 1986* (EP Act) in November 2022 (EO number: APP-0000116), as the Project is a significant Proposal that has the potential to impact on one or more of the EPA's key environmental factors. The following EPA factors were considered key environmental factors for the Project: – Flora and Vegetation; – Terrestrial Fauna; and – Social Surroundings. An additional six factors were identified as 'other environmental factors' for the Project, including: – Greenhouse Gas (GHG) Emissions; – Air Quality; – Inland Waters; – Terrestrial Environmental Quality; – Coastal Processes; and – Marine Environmental Quality. It was concluded that all factors can be managed through avoidance and mitigation measures to meet the EPA's objectives. The EPA responded on 14 August 2023, confirming that the project does not require further assessment under Part IV of the Act.

Referral to Department of Climate Change, Energy, the Environment and Water (DCCEEW)	Horizon Power referred the Project to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) under the Environment Protection and Biodiversity Act 1999 (EPBC Act) in November 2022, due to potential impacts to a National Heritage Place and listed threatened species (EPBC 2022/09407).
	DCCEEW responded on 03 April 2023, confirming that the Project is considered to be a controlled action and that the project will require assessment and approval under the EPBC Act before it can proceed. DCCEEW confirmed the method of assessment will be by preliminary documentation covering potential impacts to:
	– Threatened terrestrial species
	  ○ Northern Quoll
	  ○ Pilbara Olive Python
	  ○ Ghost Bat
	  ○ Grey Falcon
	– Threatened Shorebird Species
	  ○ Curlew Sandpiper
	  ○ Eastern Curlew
	  ○ Greater Sand Plover

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Other approvals	Assessment
	○ Great Knot ○ Lesser Sand Plover ○ Red Knot ○ Northern Siberian Bar-Tailed Godwit ○ Australian Fairy Tern – Migratory Shorebird and Seabird Species ○ Whimbrel ○ Oriental Plover ○ Wood sandpiper ○ Oriental Pratincole ○ Common Sandpiper ○ Common Greenshank ○ Gull-billed Tern ○ Caspian Tern ○ Crested Tern ○ Bridled Tern – Cultural Heritage ○ Dampier Archipelago National Heritage Place – Economic and social matters The Preliminary Documentation is currently being prepared.
Works Approval or Licence under EP Act	Not required. Not a prescribed premise.
Groundwater or surface water licence under the *Rights in Water and Irrigation Act* 1914	Not required. Covered under the *Energy Operators Powers Act 1979* s42 and s 49.
Notice of Intent to Clear system under the Soil and *Land Conservation Act* 1945	Not required.
State and municipal heritage	The DE overlaps municipal heritage site, 'Dampier Archipelago (including Burrup Peninsula)' (ID: 25086). The project is within a Municipal heritage site which will be assessed as part of the planning process.
Native title	In the 2005 Ngarluma/Yindjibarndi native title determination (Federal Court Files WAD6017/1996, WAD215/2017, and Tribunal File WCD2005/001) the Court ordered and determined that native title does not exist in relation to the Burrup.
Aboriginal Sites of Significance under the *Aboriginal Heritage Act* 1972 / *Aboriginal Cultural Heritage Act 2021.*	No known areas of Aboriginal Cultural Heritage will be impacted by the project. The project area has been covered by 5 heritage surveys and all known sites will be avoided. Unknown sites will be subject to an unexpected finds protocol and Aboriginal heritage monitors will be present on site during ground disturbance works. Horizon Power has undertaken a significant program of works to ensure its existing operational works and future projects are compliant with heritage legislation. These works included the release of a corporate Aboriginal Cultural Heritage Policy in March. As a State Government owned Government Trading Enterprise, Horizon Power understands its obligations under the relevant legislation and seeks to make proactive and sustainable business decisions that positively impact Aboriginal and Torres Strait Islander individuals, communities, and businesses. Additional details on how we approach building respectful and sustainable relationships with Aboriginal and Torres Strait Islander stakeholders and organisations can be found in our Reconciliation Action Plan.

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PROTECTED

Attachment A: Construction Environment Management Plan

Burrup Common User Transmission Infrastructure

Construction Environmental Management Plan

9/11/2022

HORIZON POWER

Document control

Revision	Reviewer		Approved for issue		
	Name	Signature	Name	Signature	Date
0	M Ryan		D Kippin		10/11/2022

Executive summary

This Construction Environmental Management Plan (CEMP) has been prepared to support referral of the Burrup Common User Transmission Infrastructure Project (the Proposal) under section (s) 38 of the *Environmental Protection Act 1986* (EP Act). The CEMP demonstrates that appropriate management measures will be in place during construction of the Proposal to ensure that the Environmental Protection Authority's (EPA's) objectives for environmental factors will be achieved.

The Referral Supporting Documentation (Horizon Power 2022a) outlines that the Proposal may impact upon three EPA key environmental factors and six 'other environmental factors', including:

- Key environmental factors:
    - Flora and Vegetation;
    - Terrestrial Fauna; and
    - Social Surroundings.
- Other environmental factors:
    - Greenhouse Gas (GHG) Emissions;
    - Air Quality;
    - Inland Waters;
    - Terrestrial Environmental Quality;
    - Coastal Processes; and
    - Marine Environmental Quality.

A detailed GHG emission assessment for the Proposal indicated that construction of the Proposal is unlikely to result in a significant increase in GHG emissions (Horizon Power 2022b). Total GHG emissions from construction of the Proposal have been estimated to be 3,176 tCO2-e, and a GHG management plan is not considered to be required (Horizon Power 2022b). Given the low emissions and other more suitable mechanisms for mitigating GHG emissions during construction of the Proposal, this factor has not been included within this CEMP.

In addition, the Proposal is not expected to significantly impact the Coastal Processes factor during construction, given the limited timeframe required to construct the transmission line infrastructure. The management measures provided in this CEMP for other factors are expected to adequately manage and mitigate any impacts to Coastal Processes, arising from construction of the Proposal.

Table ES-1 provides a summary of the preliminary key environmental factors, objectives and CEMP components for the Proposal.

Table ES-1 Construction environmental management summary

Proposal name	Burrup Common User Transmission Infrastructure
Proponent name	Horizon Power
Purpose of the CEMP	To support referral of the Proposal under s 38 of the EP Act and the EPBC and demonstrate that appropriate management measures will be in place during

	construction to ensure that the EPA's objectives for key and other environmental factors will be achieved.
Preliminary key environmental factors and CEMP objectives	**Flora and Vegetation** • Minimise impacts to flora and vegetation required for construction and operation of the Proposal as far as practicable; and • Avoid impacts to Priority 1 Burrup Peninsula rock pile communities Priority Ecological Communities (PEC) as far as practicable. **Terrestrial Fauna** • To minimise fauna habitat loss and minimise direct and indirect impacts to fauna as far as practicable. **Social Surroundings** • To minimise impacts to heritage values and visual amenity. **Terrestrial Environmental Quality** • Minimise impacts from Acid Sulphate Soils (ASS) and site contamination as far as practicable. **Marine Environmental Quality** • To minimise impacts from erosion, sedimentation and contamination to the tidal inlet between Hearson Cove and King Bay. **Inland Waters** • Minimise impacts to water quality, intermittent drainage lines and vegetation located within the tidal inlet between Hearson Cove and King Bay, as far as practicable. **Air Quality** • To minimise impacts to air quality, resulting from the generation of gaseous and dust emissions during construction.
Key components in the CEMP (if applicable)	Management based components that align with established industry practices to avoid and minimise potential environmental and heritage impacts.
Proposed construction date	Q3 2023
CEMP required pre-construction?	This CEMP has been provided with the referral to the EPA pre-construction. Additionally, a contractor CEMP will be provided to Horizon Power in alignment to this CEMP prior to construction.

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1 Context, scope and rationale

This Construction Environmental Management Plan (CEMP) has been prepared to support referral of the Burrup Common User Transmission Infrastructure (the Proposal) under section (s) 38 of the *Environmental Protection Act 1986* (EP Act). The CEMP demonstrates that appropriate management measures will be in place during construction of the Proposal, to ensure that the Environmental Protection Authority's (EPA's) objectives for key and other environmental factors will be achieved, and that works are conducted in accordance with Horizon Power's environmental policies and goals.

The CEMP has also been prepared in accordance with *Instructions on how to prepare Environmental Protection Act 1986 Part IV Environmental Management Plans* (EPA 2021a).

1.1 Proposal

This CEMP addresses the scope of the Proposal as presented in the Referral Supporting Documentation (Horizon Power 2022a), that supports the s38 referral of the Project under Part IV of the EP Act. A summary of the Proposal is presented below.

Horizon Power is proposing to expand the NWIS electricity network, by constructing an approximately 7 kilometre (km) long 132 kilovolt (kV) overhead transmission line between the Dampier substation and the Burrup Strategic Industrial Area (SIA) (the Proposal). The Burrup SIA is not currently connected via transmission infrastructure to the NWIS.

The Proposal will provide common user transmission infrastructure, owned and operated by Horizon Power. As a result, the Proposal will also provide opportunities for tenants on the Burrup to access the higher efficiency generation portfolio, including proposed renewable energy resources available on the NWIS. The Proposal is considered the first step to providing enabling infrastructure to the Burrup SIA to support the transition towards State and Federal Government emission reduction targets.

Horizon Power has been nominated by the State as the preferred proponent to develop the required transmission infrastructure from Dampier to the Burrup, due to the constrained nature of land availability and the desire for the infrastructure to be common user.

The Proposal is located on Murujuga (Burrup Peninsula) in WA, approximately 1.5 km east of the Dampier township. Murujuga and its surrounds supports extensive Aboriginal cultural heritage sites, with the wider Dampier Archipelago region known to have one of Australia's greatest collections of rock art (petroglyphs) (DEC 2013). Horizon Power has worked with the Murujuga Aboriginal Corporation (MAC) extensively in relation to the Proposal, to undertake detailed Aboriginal cultural heritage site avoidance surveys. These surveys have assisted Horizon Power to progress the transmission route design to avoid impacts to Aboriginal cultural heritage sites. Horizon Power is committed to avoiding direct impact to known Aboriginal cultural heritage (Figure 1).

Construction of the Proposal is anticipated to commence in 2023 and is estimated to take two years (subject to approvals). The construction elements of the Proposal include the following:

- Permanent elements:
    - Approximately 7 km long 132 kV overhead transmission line;

- Approximately 40 poles and cleared pole access pads (40 m x 20 m), and associated pole stays along the transmission line route;
- Cleared, unsealed access track along the transmission line route;
- Burrup substation;
- Dampier substation expansion; and
- Associated electrical infrastructure.

- Temporary elements:
  - Additional areas required to construct the transmission line;
  - Cleared access track for the purpose of stringing the transmission line; and
  - 50 m x 40 m winch sites as required.

The Development Envelope (DE) has a total extent of 85.61 ha and represents the boundary surrounding the Proposal within which all development will be contained. Construction and operation of the Proposal will require both permanent and temporary clearing of native vegetation, with any areas required for temporary construction works being rehabilitated upon completion of construction. The Proposal will require the clearing of up to 14.40 ha of native vegetation (including 11.50 ha of permanent disturbance and 2.90 ha of temporary disturbance). It should be noted that the 14.40 ha clearing extent represents the maximum area of disturbance required to construct and install the Proposal, where opportunities are available clearing will be minimised. Pole placement and span within the DE is flexible, and therefore, the Disturbance Footprint shown on Figure 2 is indicative only and is subject to change as the design of the Proposal develops.

The northern quarter of the DE is highly constrained by Aboriginal cultural heritage and environmental values (namely the Priority 1 ‘Burrup Peninsula rock pile communities’ Priority Ecological Community [PEC]) (Figure 2). In the unlikely event that construction of the Proposal is constrained by Aboriginal cultural heritage (i.e. an unexpected find during initial ground disturbing works) within this area, minor impacts to the Burrup Peninsula rock pile communities PEC may be required (up to 0.05 ha). This clearing (if required) will be kept to the minimum extent practicable for constructability and will be approved by Horizon Power’s Manager of Sustainability prior to undertaking clearing activities. It is noted that the DE has been previously surveyed for Aboriginal cultural heritage and therefore the clearing of the Priority 1 PEC is only to be implemented in the event of an unexpected find. Murujuga Aboriginal Corporation (MAC) monitors will also be present during construction.

To ensure the Proposal avoids impacts to significant environmental and heritage values that are present on the Burrup, 'avoidance areas’ have been developed within the DE (Figure 2). Construction of the Proposal will avoid these 'avoidance areas', unless an unexpected Aboriginal cultural heritage find is encountered which constrains construction of the Proposal.

Paper Size ISO A3

0 0.5 1 1.5 2

Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA2020
Grid: GDA2020 MGA Zone 50

N

GHD

Horizon Power
Burrup Expansion Program

Proposal Location and Development Envelope

Project No. **12582802**
Revision No. **0**
Date **09/11/2022**

FIGURE 1

\\ghdnet\ghd\AU\Perth\Projects\61\12582802\GIS\Maps\Working\12582802_EPA\12582802_EPA.aprx\12582802_CEMP_001_RevA_ProjectLocation
Print date: 09 Nov 2022 - 12:45

Data source: World Topographic Map: Esri, HERE, Garmin, Foursquare, METI/NASA, USGS
Landgate_Subscription_Imagery\WANow:
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS. Created by: rbrown3

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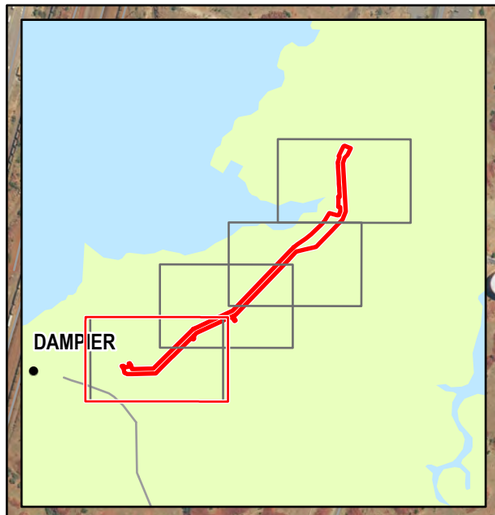

Burrup Rd

Dampier Rd

SLIP
POWERED BY LANDGATE

Legend

- Major Roads
- Minor Roads
- Development Envelope
- Indicative Impact Area
- Avoidance Areas

Paper Size ISO A3
at Scale: 1:7,000

0 0.5 1
Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

N

GHD

Horizon Power
Burrup Expansion Program

Indicative Proposal Disturbance Footprint and Avoidance Areas

Project No. **12582802**
Revision No. **0**
Date **09/11/2022**

FIGURE 2
Page 1 of 4

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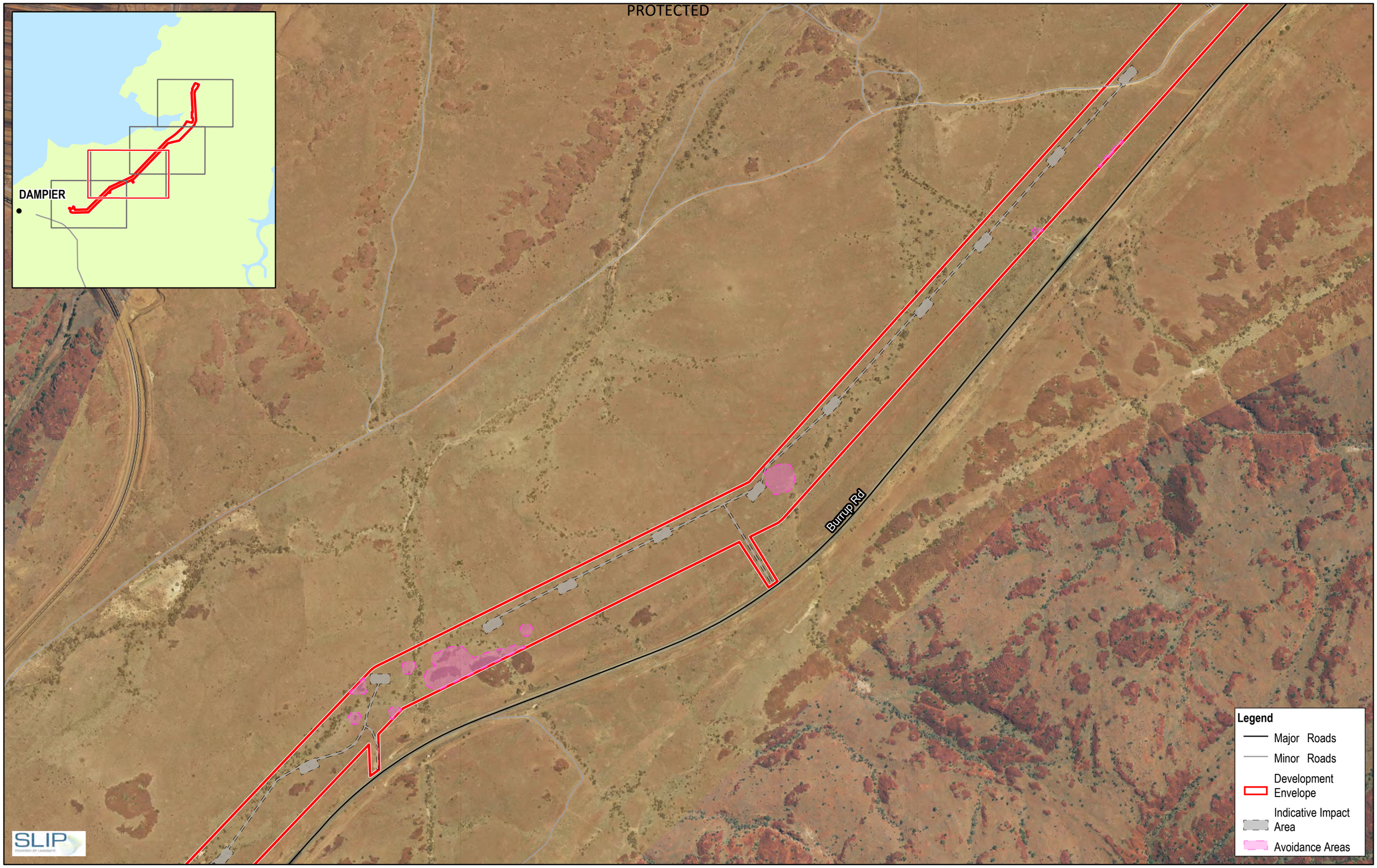

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Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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Horizon Power
Burrup Expansion Program

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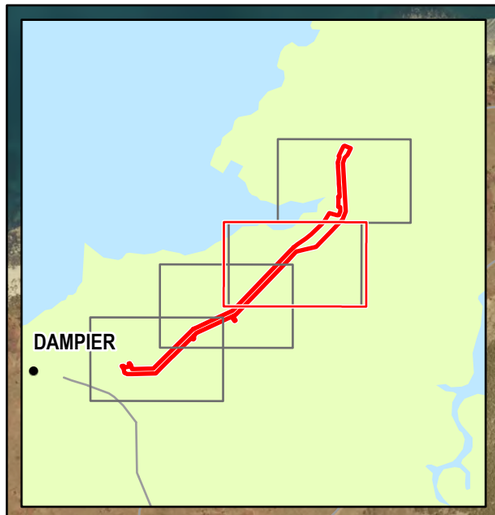

Hearson Cove Rd

Burrup Rd

Legend
- Major Roads
- Minor Roads
- Development Envelope
- Indicative Impact Area
- Avoidance Areas

SLIP

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Kilometres

Map Projection: Transverse Mercator
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Burrup Expansion Program

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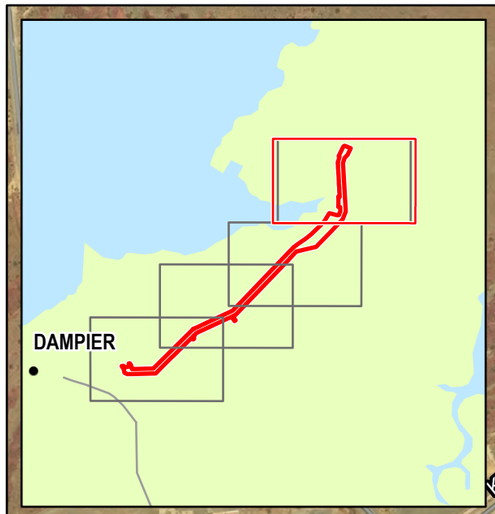

Village Rd

King Bay Rd

Griffin Rd

Burrup Rd

Mermaid Rd

Streckfuss Rd

Hammonds Rd

Hearson Cove Rd

SLIP

Legend

- Major Roads
- Minor Roads
- Development Envelope
- Indicative Impact Area
- Avoidance Areas

Paper Size ISO A3
at Scale: 1:7,000

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Kilometres

Map Projection: Transverse Mercator
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Horizon Power
Burrup Expansion Program

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1.2 Key environmental factors

The Referral Supporting Documentation (Horizon Power 2022a) outlines that the Proposal may impact upon three EPA key environmental factors and six 'other environmental factors', including:

- Key environmental factors:
  - Flora and Vegetation;
  - Terrestrial Fauna; and
  - Social Surroundings.
- Other environmental factors:
  - Greenhouse Gas (GHG) Emissions;
  - Air Quality;
  - Inland Waters;
  - Terrestrial Environmental Quality;
  - Coastal Processes; and
  - Marine Environmental Quality.

A detailed GHG emission assessment for the Proposal indicated that construction of the Proposal is unlikely to result in a significant increase in GHG emissions (Horizon Power 2022b). Total GHG emissions from construction of the Proposal have been estimated to be 3,176 tCO2-e, and a GHG management plan is not considered to be required (Horizon Power 2022b). Given the low emissions and other more suitable mechanisms for mitigating GHG emissions during construction of the Proposal, this factor has not been included within this CEMP.

In addition, the Proposal is not expected to significantly impact the Coastal Processes factor during construction, given the limited timeframe required to construct the transmission line infrastructure. The management measures provided in this CEMP for other factors are expected to adequality manage and mitigate any impacts to Coastal Processes, arising from construction of the Proposal.

Table 1 presents the three preliminary key environmental factors and the four other environmental factors relevant to construction of the Proposal, the Proposal activities that would affect the aspects and the site-specific environmental values, uses and sensitive components that will be affected.

Table 1 Key environmental factors, construction activities and site characteristics

Key environmental factor	Proposal construction activities that would affect the factor	Site specific environmental values, uses and sensitive components
Flora and Vegetation	• Loss of vegetation and flora through clearing, including significant and riparian vegetation, and flora; • Introduction and/or spread of environmental weeds;	Clearing of up to 14.40 ha (including 11.50 ha of permanent clearing and up to 2.90 ha of temporary clearing) of native vegetation within the DE, including: • Native vegetation across thirteen VTs; • Native vegetation mapped across Vegetation Association 117; • Native vegetation mapped across the Granitic and Littoral Land Systems;

Key environmental factor	Proposal construction activities that would affect the factor	Site specific environmental values, uses and sensitive components
	• Alteration of fire regimes; • Alteration to hydrological flows; and • Spills or leaks of chemical, hydrocarbon and/or hazardous materials.	• Up to 2.50 ha of riparian vegetation (worst case scenario – the indicative clearing area indicates clearing of approximately 0.72 ha); and • Up to 1.50 ha of vegetation located within the tidal inlet between Hearson Cove and King Bay (worst case scenario – the indicative clearing area indicates clearing of approximately 0.47 ha). Clearing of significant flora, including: • Clearing of up to 19 individuals of *Terminalia supranitifolia* (Priority 3); and • Clearing of up to six (6) individuals of *Rhynchosia bungarensis* (Priority 4). No planned impacts to: • *Vigna triodiophila* (Priority 3); • Threatened Ecological Communities (TECs); and • Priority 1 Burrup Peninsula rock pile communities PEC (as far as practicable).
Terrestrial Fauna	• Loss of fauna habitat through clearing, including habitat for significance fauna species; • Fauna injury/death from vehicle strike/clearing activities; • Fauna activity disturbance from temporary increase in noise/vibration during construction; and • Bushfire resulting in damage/loss of surrounding fauna habitats.	Clearing of up to 14.40 ha (including 11.50 ha of permanent clearing and up to 2.90 ha of temporary clearing) of fauna habitat. The five fauna habitats provide breeding and/or foraging value to: • Two significant fauna species: o North-western Free-tail Bat (*Mormopterus (Ozimops) cobourgianus*); and o Whimbrel (*Numenius phaeopus*) • An additional fifteen species (11 birds, 2 mammals, 2 reptiles), including: o Ten Migratory species; o Two Threatened species; and o Three Priority species. No planned impact to: • Short-Range Endemic fauna and/or their habitats are expected.
Social Surroundings	• Potential indirect impacts to known Heritage Sites and areas within the National Heritage Place as a result of blasting debris, vibration and dust deposition from ground preparation works during construction	Dampier township located approximately 1.5 km to the west. Clearing and ground disturbance within: • The Dampier Archipelago (including the Burrup Peninsula) National Heritage Place; and • The Dampier Archipelago including Burrup Peninsula (Place No. 25086) Municipal Heritage site. No direct impact to:

Key environmental factor	Proposal construction activities that would affect the factor	Site specific environmental values, uses and sensitive components
	• Potential to impact upon amenity (visual, noise and vibration).	• Known Aboriginal cultural heritage sites within the DE; and • State heritage sites Potential for unexpected finds during ground disturbance to facilitate construction.
Terrestrial Environmental Quality	• Excavation of ASS; • Soil erosion and sediment discharge; • Excavation of unexpected contamination; and • Accidental spills or leaks of hazardous materials or wastes.	ASS risk mapping of the DE indicates that the soils have a 'high to extremely low' probability of ASS occurrence (ASRIS 2022). Clearing, ground disturbance and soil excavation within: • A small section of the DE (approximately 15.50 ha) which is mapped as having a high probability of ASS occurrence; • Intermittent drainage lines; and • Tidal inlet between Hearson Cove and King Bay.
Marine Environmental Quality	• Loss of intertidal adapted vegetation; • Loss of habitat for Migratory birds; • Excavation of ASS; • Soil erosion and sediment discharge; • Excavation of unexpected contamination; and • Accidental spills or leaks of hazardous materials or wastes.	Clearing and ground disturbance (up to 1.50 ha) within the tidal inlet between Hearson Cove and King Bay.
Inland Waters	• Excavation of ASS; • Soil erosion and sediment discharge; • Accidental spills or leaks of hazardous materials or wastes; and • Construction works in the vicinity of drainage lines and the the tidal inlet between Hearson Cove and King Bay.	Clearing, ground disturbance and soil excavation within: • Intermittent drainage lines; • Pilbara proclaimed Groundwater Area; and • Tidal inlet between Hearson Cove and King Bay.
Air Quality	• Dust emissions; • Gaseous emissions.	Dust emissions generated during clearing, ground disturbance and drilling during construction of the Proposal.

1.3 Rationale and approach

The CEMP components have been developed with consideration of key environmental aspects, the findings of surveys and studies, and the environmental risks posed by the Proposal construction activities.

1.3.1 Environmental outcome or management objective(s)

The objective of this CEMP is to ensure that appropriate management measures will be in place during construction of the Proposal, to achieve the EPA's objectives for key environmental factors. This CEMP adopts management objectives based on consideration of:

- Survey and study findings;
- Key assumptions and uncertainties;
- Risks to environmental values including MNES;
- Scientific information on the site and region;
- Intensity, duration, magnitude and footprint of impact;
- Changes in the environment;
- External issues to the Proposal; and
- Timeframe for mitigation.

The management-based components provided within this CEMP seek to align with established industry practises to avoid and minimise potential environmental and heritage impacts. This CEMP has the following objectives for the preliminary key environmental factors and other environmental factors identified in the referral of the Proposal:

- Flora and Vegetation:
    - Minimise impacts to flora and vegetation required for construction and operation of the Proposal as far as practicable; and
    - Avoid impacts to Priority 1 Burrup Peninsula rock pile communities Priority Ecological Communities (PEC) as far as practicable.
- Terrestrial Fauna:
    - To minimise fauna habitat loss and minimise direct and indirect impacts to fauna as far as practicable.
- Social Surroundings:
    - To minimise impacts to heritage values and visual amenity.
- Terrestrial Environmental Quality:
    - Minimise impacts from Acid Sulphate Soils (ASS) and site contamination as far as practicable.
- Marine Environmental Quality:
    - To minimise impacts from erosion, sedimentation and contamination to the tidal inlet between Hearson Cove and King Bay.
- Inland Waters:
    - Minimise impacts to water quality, intermittent drainage lines and vegetation located within the tidal inlet between Hearson Cove and King Bay, as far as practicable.
- Air Quality:

- To minimise impacts to air quality, resulting from the generation of gaseous and dust emissions during construction.

1.3.2 Survey and study findings

Table 2 presents the studies that have been undertaken for the Proposal, which have informed the rationale and approach for this CEMP. The extent of survey coverage is shown on Figure 3.

Table 2 Surveys and studies relevant to the Proposal

Key environmental aspect	Studies	Author
Flora and Vegetation	Flora and vegetation survey, including a desktop assessment and field survey	Vicki Long and Associates (VLA) (2019)
	Detailed flora and vegetation field survey, including a desktop assessment and field survey	GHD (2019)
	Level 1 flora and vegetation survey, including a desktop assessment and field survey	GHD (2020a)
	Flora and vegetation reconnaissance survey	GHD (2022)
Terrestrial Fauna	Level 1 fauna (reconnaissance) survey, including a desktop assessment and field survey	GHD (2019)
	Level 1 fauna survey, including a desktop review and field survey	GHD (2020b)
	Fauna habitat reconnaissance survey	GHD (2022)
Social Surrounds	Horizon Power's Karratha to Dampier 132 kV Transmission Line Survey, Pilbara, Western Australia	Archae-aus Pty ltd (Archae-aus) (2019)
	Horizon Power Burrup Peninsula Transmission Line Archaeological & Ethnographic Survey	CBG Solutions (CBG) (2020)
	Archaeological Survey, Horizon Power Burrup Transmission Line Project	Scarp archaeology (Scarp) (2022)
	Ethnographic Cultural Heritage Assessment: Site Avoidance Survey of Horizon Power's Burrup Transmission Line Project	Acacia Cultural Heritage Consulting (Acacia) (2022)
	Desktop review of sensitive receptors and reserves	Horizon Power (2022a)
Terrestrial Environmental Quality	Desktop review of ASS mapping	Horizon Power (2022a)
Marine Environmental Quality	Flora and vegetation survey, including a desktop assessment and field survey	Vicki Long and Associates (VLA) (2019)
	Level 1 flora and vegetation survey, including a desktop assessment and field survey	GHD (2020a)

Key environmental aspect	Studies	Author
Inland Waters	Desktop review of topographic mapping, aerial imagery and hydrology mapping	Horizon Power (2022a)
Air Quality	Desktop review of sensitive receptors within the vicinity of the Proposal	Horizon Power (2022a)

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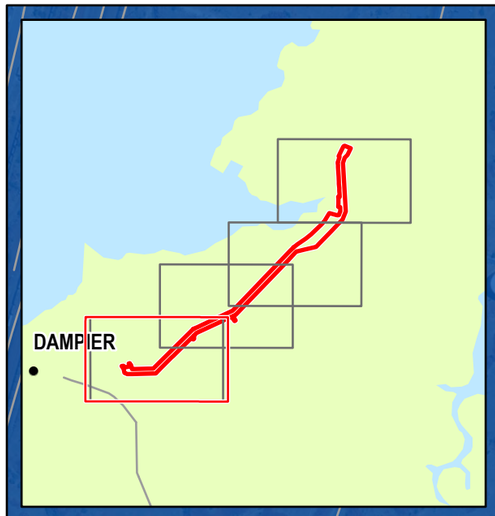

Burrup Rd

Dampier Rd

SLIP
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Legend

- Major Roads
- Minor Roads
- Development Envelope
- Conservation recreation and natural landscapes
- District roads
- Public purposes
- State and regional roads
- Strategic industry

Paper Size ISO A3
at Scale: 1:7,000

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Kilometres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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Horizon Power
Burrup Expansion Program

Land Use

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FIGURE 3
Page 1 of 4

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Burrup Rd

SLIP
POWERED BY LANDGATE

Legend

- Major Roads
- Minor Roads
- Development Envelope
- Conservation recreation and natural landscapes
- District roads
- Strategic industry

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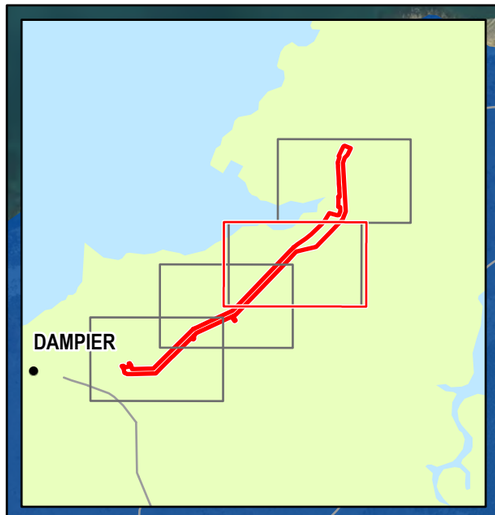

Hearson Cove Rd

Burrup Rd

SLIP
POWERED BY LANDGATE

Legend

- Major Roads
- Minor Roads
- Development Envelope
- Conservation recreation and natural landscapes
- District roads
- Strategic industry

Paper Size ISO A3
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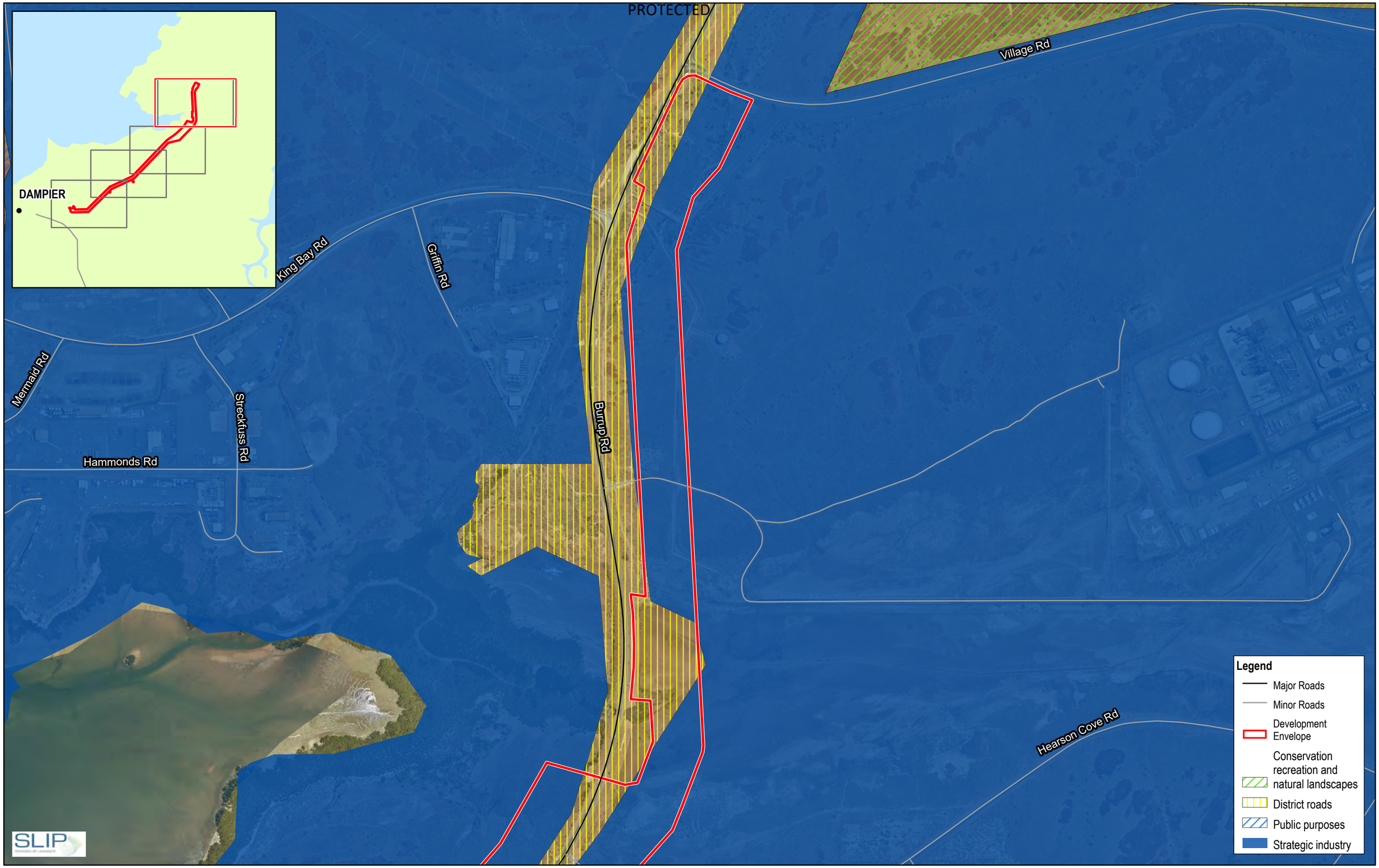

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Flora and Vegetation

The vegetation surveys (VLA 2019, GHD 2019, 2020a &2022b) identified 79.04 ha of remnant native vegetation within the DE. The Proposal will clear up to up to 14.40 ha of native vegetation (including 11.50 ha of permanent disturbance and 2.90 ha of temporary disturbance). The presence of one PEC, the Priority 1 Burrup Peninsula rock pile communities, was recorded within the DE. Construction of the Proposal will avoid impacts to occurrences of this PEC as far practicable.

Two vegetation types within the DE are considered to represent riparian vegetation, as they are associated with drainage lines that occur within the DE. There is 6.56 ha of riparian vegetation within the DE.

In addition, three vegetation types that are located in the tidal inlet between Hearson Cove and King Bay may have some significance due to limited distribution and impacts from threatening processes such as clearing and development on the Murujaga. There is 9.11 ha of this vegetation within the DE.

No *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) listed or *Biodiversity Conservation Act 2016* (BC Act) listed Threatened flora taxa were recorded within the DE. Three Department of Biodiversity, Conservation and Attractions (DBCA) listed Priority flora species were recorded within the DE, including:

- *Rhynchosia bungarensis* (Priority 4);
- *Terminalia supranitifolia* (Priority 3); and
- *Vigna tridiophila* (Priority 3).

The Proposal will require the clearing of up to nineteen individuals of *Terminalia supranitifolia* and up to six individuals of *Rhynchosia bungarensis.* Construction of the Proposal will avoid impacts to *Vigna tridiophila.*

No Declared Pests or Weeds of National Significance (WoNS) were recorded within the DE.

Terrestrial Fauna

The fauna surveys (GHD 2019, 2020b & 2022b) identified 78.26 ha of vegetation that is suitable fauna habitat within the DE. The Proposal will clear up to up to 14.40 ha of fauna habitat (including 11.50 ha of permanent disturbance and up to 2.90 ha of temporary disturbance).

Fauna habitat within the DE is suitable for two significant fauna species that have been recorded within the DE and an additional fifteen significant fauna species which have the potential to occur within the DE.

The Burrup Peninsula rock pile communities PEC (Priority 1) is associated with the presence of Short-Range Endemic (SRE) land snails. There may be some suitable habitat for these species within the DE, however, based on the limited disturbance required to construct the transmission line, any impact would be small and localised (GHD 2020b). In addition, the design of the Proposal will avoid impacts to the Burrup Peninsula rock pile communities PEC as far as practicable, reducing any potential impacts that may result on these SRE fauna species.

Social Surrounds

The DE is located approximately 1.5 km east of the Dampier township.

Four Aboriginal cultural heritage surveys (archaeological and ethnographic, refer to Table 2) have been undertaken by MAC and their consultants within and surrounding the DE, to confirm the presence of Aboriginal cultural heritage values. The surveys identified a number of heritage sites within the DE, with the Proposal being designed to avoid impacts to these sites during both construction and operation. These surveys have informed the current design of the Proposal, specifically the pole locations and the location of the proposed site access tracks. The places of Aboriginal cultural heritage significance identified within the DE are being treated as Aboriginal sites under Section 5 of the *Aboriginal Heritage Act 1972* (AHA), and therefore, Horizon Power has amended Proposal designs to avoid impacts to all identified sites.

Terrestrial Environmental Quality

Acid Sulphate Soil (ASS) risk mapping of the DE indicates that the soils have a high to extremely low probability of ASS occurrence (ASRIS 2022). Only a small section within the northern portion of the DE (approximately 15.5 ha) has a high probability of ASS occurrence, indicating that there is a high risk of ASS occurring within 3 m of the natural soil surface and could be disturbed by most land development activities, such as earthworks and dewatering (ASRIS 2022).

Marine Environmental Quality

The Proposal traverses a 0.5 km portion of the tidal inlet between Hearson Cove and King Bay. The inlet comprises mudflats and becomes inundated with water during high tides (considered to be less than 1% of the year and therefore, very intermittently connected to the marine environment), which then retracts to several small pools and a minor drainage line during the low period. The tidal inlet between Hearson Cove and King Bay provides habitat for Migratory bird species as they move between King Bay and Hearson Cove. Three vegetation types (totalling 9.11 ha) were found growing in association with this tidal inlet within the DE. The tidal inlet between Hearson Cove and King Bay is also mapped as having a has a high probability of ASS occurrence.

Inland Waters

The Proposal is located within the Karratha Coast Zone of the Pilbara Province. The Karratha Coast Zone is characterised by coastal mudflats with sandy coastal plains and some hills on marine deposits and some sedimentary and volcanic rocks of the Pilbara Craton

There are no permanent watercourses or wetlands within the DE, however numerous intermittent drainage lines intersect the DE. The Proposal lies within the Pilbara Groundwater Area, which is proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act).

Air Quality

There are no nearby sensitive receptors within 500 m of the Proposal. The closest receptor is Dampier township located 1.5 km west of the DE.

1.3.3 Key assumptions and uncertainties

Biological survey validity

The majority of the biological surveys (VLA 2019, GHD 2019, 2020a & 2022b) reported nil to minor limitations in either the desktop or field components, and therefore, do not pose any substantial uncertainty with respect to this CEMP. GHD (2020b) reported a moderate limitation for the aspect of timing/weather/season/cycle. The GHD (2020b) survey was conducted in June and July 2019 which is considered to be relatively late in the season for assessing migratory birds. Due to the timing of the survey and the habitats present within the GHD (2020b) survey area, migratory species may not have been identified during the survey. To address this limitation, the CEMP adopts a conservative approach to protecting migratory species and their habitats.

Aboriginal cultural heritage

As discussed above, the Aboriginal cultural heritage surveys described in Table 2 identified a number of Aboriginal cultural heritage sites located within the DE. The design of the Proposal has undergone significant change to ensure these sites are not impacted or disturbed. Further amendments will be considered during the detailed design phase and construction methods will consider the location of the sites to ensure a suitable clearance area can be maintained. The surveys identified a number of avoidance and mitigation measures which Horizon Power will implement during construction to reduce the risk of potential impacts to these sites. These measures include (but are not limited to) the presence of Aboriginal cultural heritage monitors to ensure there is no impact to heritage sites, and to identify and manage unexpected heritage finds should they be encountered during construction (e.g. subsurface). A Cultural Heritage Management Plan will also be prepared for the Proposal.

1.3.4 Management approach

The management approach for this CEMP adopts a risk-based approach to identify and prioritise management provisions, based on:

- Environmental values identified in Section 1.2;
- Available scientific information as summarised in Section 1.3.2; and
- Consideration of uncertainties as stated in Section 1.3.3.

This includes identification of the following environmental factors within, adjacent to or in close proximity to the Development Envelope:

- Habitats for conservation significant flora, fauna and ecological communities;
- Terrestrial environmental quality;
- Marine Environmental Quality;
- Sensitive receptors;
- Inland waters; and
- Aboriginal and European heritage sites.

The management approach in this CEMP is conservative, with the view of managing impacts during construction of the Proposal. The CEMP adopts an environmental management hierarchy in the prioritisation of management provisions:

- Avoidance: measures taken to avoid impact;
- Minimisation: measures taken to reduce the duration, intensity and/or extent of impact; and
- Restoration: measures taken to restore previously existing conditions.

1.4 Rationale for choice of indicators and/or management actions

This CEMP adopts provisions based on industry standard practices for avoidance, minimisation and rehabilitation of environmental impacts during construction.

The provisions reflect the temporary duration of construction activities presented in Table 1, and the intermittent, episodic and acute nature of impacts posed by construction activities, such as un-authorised clearing, dust emissions during high winds, or accidental spills of hazardous materials or wastes.

The provisions have also reflected the potential for chronic impacts to occur post construction, such as the spread of introduced weeds or ongoing erosion of areas disturbed during construction, as well as impacts relating to maintenance and operating activities.

The provisions consider the effects of issues external to the Proposal, including:

- Heavy rainfall events (e.g. cyclones), flooding and wet ground conditions; and
- Movements of stock across disturbed areas.

The majority of provisions address episodic and acute impacts and provide short term mitigation. Provisions also address the longer term timeframes to demonstrate weed control and rehabilitation success.

2 CEMP components

This section of the CEMP presents the proposed components of environmental management during construction of the Proposal. The CEMP provisions represent the Proponent's commitments for environmental management and demonstrate that construction activities will be appropriately managed to achieve the EPA's objectives for the key environmental factors identified for the Proposal.

2.1 Management systems and implementation

This CEMP utilises objective-based components. The selection of objective-based components rather than outcome-based components is due to the Proposal construction activities posing environmental risks that are generally intermittent, episodic or acute impact events that are less applicable to objective measurement and reporting.

Horizon Power has well established management measures that will be implemented during construction of the Proposal. In addition, Horizon Power maintains an Environmental Management System (EMS). Works conducted as a part of this Proposal will be compliant with both Horizon Power's Environmental Policy and EMS.

2.1.1 Roles and responsibilities

Horizon Power has a standard project management methodology that will be applied to this Proposal and is applied to projects of this nature. A project board is established as a governing committee, which comprises executive and senior managers from Horizon Power. The role of the Project Board is to support the Project Sponsor with the management of the Proposal by providing a decision-making and governance framework that is logical, robust and repeatable.

The Project team roles and responsibilities is provided in Table 3.

Table 3 Project Board Roles and Responsibilities

Role	Responsibility
Project Sponsor (Executive member)	• Oversee the overall delivery of the project to ensure good governance is achieved and project objectives are met
Project Director (Senior Manager)	• Establish the project team to deliver the project • Ensure plans, systems and processes are established, implemented and maintained by the project team to ensure good governance is achieved on the project • Ensure the project objectives are visible to the project team and delivery of the objectives are met by the project • Monitor performance of the project
Project Manager	• Establish project plans to manage the project • Manage project team activities to deliver the project • Implement systems and processes to ensure good governance is achieved on the project • Manage scope, cost, time, quality, resourcing and compliance obligations for the project • Report performance of the project
Site Representative	• Oversee activities onsite to deliver the project

	• Monitor systems and processes being implemented onsite to ensure good governance is achieved on the project • Manage specific onsite compliance obligations for the project • Report onsite performance of the project
Environmental Officer	• Oversee activities onsite to deliver the project • Monitor systems and processes being implemented onsite to ensure good governance is achieved on the project • Manage specific onsite compliance obligations for the project • Report onsite performance of the project

2.1.2 Communication

Communication during the construction phase of the Proposal will occur on a daily, weekly or as-needed basis with relevant staff, project managers or external stakeholders. Proposal communication will be subject to the requirements of the construction contact, as determined by Horizon Power. Horizon Power has identified key external stakeholders and will ensure Proposal information is communicated as appropriate and as required. A log of communications with external stakeholders and the public will be maintained.

Key external stakeholders include:

- Department of Premier and Cabinet (DPC);
- Department of Water and Environmental Regulation (DWER);
- Department of Planning Land Heritage on behalf of the DBNGP Land Access Minister;
- Department of Planning, Lands and Heritage (DPLH);
- Department of Jobs, Tourism, Science, and Innovation (JTSI);
- Development WA (DevWA);
- Main Roads Western Australia (MRWA);
- Water Corporation;
- City of Karratha;
- Ngarluma Aboriginal Corporation (NAC);
- Murujuga Aboriginal Corporation (MAC);
- Rio Tinto (covers Hamersley Iron);
- Yara;
- Woodside; and
- Australian Gas Infrastructure Group (AGIG).

All external communication will be managed by Horizon Power. Construction Contractors are not to engage with external stakeholders unless otherwise instructed by Horizon Power or as per contract terms.

A plan for specific engagement with community and special interest groups will be developed, to provide these groups with Proposal information regarding environmental and heritage matters.

2.1.3 Environmental awareness, training and inductions

All construction personnel and sub-contractors will undergo a Proposal induction, which includes information on the importance of the environmental approvals conditions and the requirements to enable environmental outcomes to be achieved. They will be advised of their responsibilities with regard to the EPBC Act, BC Act, and other relevant legislation, in

addition to ministerial and contractual requirements. A record of inductions will be maintained.

Daily toolbox meetings will be used to reinforce messages on environmental protection, to relay new information and to encourage and celebrate positive outcomes.

Key personnel working on the Proposal will undertake cultural awareness training to ensure an appropriate level of understanding is maintained on heritage and related matters for the duration of the Proposal.

2.1.4 Monitoring

Frequent observations of the construction site will be conducted to ensure the objectives of this CEMP are implemented and that the required management actions are in place.

2.1.5 Environmental incidents / non-compliances

Environmental incidents and non-compliances will be identified and recorded as soon as possible by the relevant responsible persons within the contractor organisation or Horizon Power. Incidents will be mitigated or rectified where possible within 48 hours of being identified. Incidents and non-conformances will be reported to the Horizon Power representative within 48 hours of identification or as soon as reasonably practicable.

Any non-conformance to this CEMP is to be investigated to determine:

- Why the non-conformance occurred;
- What was the environmental harm or alteration of the environment that resulted from the non-conformance;
- What changes to project activities and/or management plans is required; and
- Measures to prevent, control or abate the environmental harm that may have occurred.

A log of incidents and non-conformances is to be maintained.

2.2 Flora and Vegetation

The management components for flora and vegetation are outlined in Table 4.

Table 4 Flora and Vegetation – management components

EPA factor and objective	Flora and Vegetation: *To protect flora and vegetation so that biological diversity and ecological integrity are maintained* (EPA 2021b)
CEMP objective	• Minimise impacts to flora and vegetation to that required for construction and operation of the Proposal as far as practicable; and • Avoid impacts to Priority 1 Burrup Peninsula rock pile communities Priority Ecological Communities (PEC) as far as practicable
Key environmental values	• Native vegetation including significant flora and riparian vegetation • Burrup Peninsula Rock Pile PEC
Key impacts and risks	• Loss of vegetation and flora through clearing, including significant flora and riparian vegetation; • Potential loss of significant vegetation (Burrup Peninsula Rock Pile PEC) if previously unknown Aboriginal cultural heritage sites are uncovered during construction and constrain access necessary for construction • Introduction and/or spread of weeds degrading the condition of adjacent vegetation; • Alteration of fire regimes; and • Alteration to hydrological flows.

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
Vegetation clearing				
• No clearing of vegetation to occur outside of the pre-defined clearing limits and boundaries described within	Job Hazard Analysis (JHA) or equivalent to include the risks and mitigation actions to be understood and adhered to as they pertain to the contractor and scope of work on the JHA	All relevant contractors to sign onto JHA or equivalent on a daily basis	During construction	JHA records
	Demarcate defined clearing limits and boundaries described within approval documents using	Weekly inspections within the work area of 'avoidance		JHA records

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
approval documents, during or attributable to construction; and • No impacts to significant flora and significant vegetation outside of the pre-defined clearing limits and boundaries described within approval documents	appropriate visual markers prior to ground disturbing activities	areas' demarcation will be undertaken to confirm markings remain in place and are accurate		
	Vegetation 'avoidance areas' with the potential to be impacted by construction activities will be clearly demarcated (e.g. by using temporary flagging) prior to ground disturbing activities			
	Visual inspection and approval of the Proposal-defined clearing limits and boundaries will be undertaken prior to ground disturbing activities			
	• In the unlikely event that construction of the Proposal is constrained by Aboriginal cultural heritage within the northern quarter of the DE (e.g., an unexpected find during initial ground disturbing works), minor impacts to the Burrup Peninsula rock pile communities PEC may be required (up to 0.05 ha); and • Clearing will be kept to the minimum extent practicable for constructability and a valid pathway through the mapped 'avoidance areas' will be approved by Horizon Power's Manager of Sustainability	• Proposed clearing limit of Burrup Peninsula rock pile communities and a valid pathway through the mapped 'avoidance areas' to be approved by Horizon Power's Manager Sustainability prior to undertaking any clearing activities; • Pre-clearance inspections to ensure pegged clearing area of Burrup Peninsula rock pile communities PEC through the avoidance areas is as minimal as possible; and • Daily inspection of clearing extents within the norther quarter of	Prior to and during construction	• Inspection records; • Vegetation clearing records and annual environmental reporting; and • Report unauthorized clearing as soon as practicable after identified

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
		the DE during clearing activities to confirm no over clearing of PEC		
	Minimise clearing to the extent required during construction, and the ongoing maintenance and operation of the assets	• Routine inspection of Proposal defined clearing limits and boundaries demarcation during clearing activities; and • Daily inspection of clearing extents during clearing activities to confirm no over clearing	During construction	Vegetation clearing records and annual environmental reporting Report unauthorized clearing as soon as practicable after identified
	Vehicles and machinery to remain on designated roads/access tracks areas where possible			
	Areas required for temporary construction purposes, such as tracks, offices, stockpiling and laydown areas, will be located within existing cleared areas, or areas required for permanent infrastructure, where possible			
	Visual inspection and record of cleared areas to be undertaken post-clearing to confirm no over clearing	N/A	Post construction	Annual Compliance Reporting Maintain records of rehabilitation
	Retain the vegetative material and topsoil removed by clearing authorised under this permit and stock-pile the vegetative material and topsoil in an area that has already been cleared. Construct drainage around topsoil stockpiles.			
	At an optimal time within 12 months following com-pletion of temporary clearing, revegetate the areas not required for the authorised purpose for which they were cleared under this permit, by: (i) ripping the ground on the contour to remove soil compaction; and (ii) laying the vegetative material and topsoil retained under condition 10(a) on the cleared area(s)			

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
	Where possible direct return of topsoil material will be undertaken		During and post construction	
Weeds				
Minimise the spread and/or introduction of weeds	All site personnel to be inducted on environmental responsibilities including hygiene management	Record of all site personnel that have undertaken the induction	Prior to construction	Induction records
	Vehicles and equipment to be inspected and cleaned of soil, vegetation material and seeds on entry/exit to site	Routine spot checks of vehicles and equipment compliance with cleaning	During construction	Results of spot checks of vehicle and equipment cleaning compliance
	Vehicles and machinery to remain on designated roads/access tracks areas where possible			
	Fill material brought to site is to be certified weed free	Inspection of fill material and certification		Maintain records of fill certification
	• Implement a quarterly weed monitoring and management program for the first year following completion of ground disturbance activities; and • Ad-hoc weed checks during operational maintenance activities	Quarterly weed inspection and management program	Post construction	Annual Compliance Reporting
Hydrological flows				
Minimise indirect impacts to surrounding/adjacent areas from altered surface water drainage and flows	Local drainage to be considered during site design and layout	Routine visual inspections for environmental compliance.	Prior to construction	Annual Compliance Reporting
	Disturbances to drainage lines will be avoided (where possible) or otherwise minimised		During construction	
Fire regimes				

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
No unplanned fires as a result of Proposal activities	All site personnel to be inducted on environmental responsibilities including fire prevention.	Record of all site personnel that have undertaken the induction	Prior to construction	Induction records
	All non-essential work is to be stopped or postponed in the event that a Total Fire Ban with Catastrophic fire danger ratings or Emergency Warning is issued for the Burrup Peninsula. Works to be conducted in accordance with all local fire control laws and regulations	N/A	At all times	Incident reporting system
	Vehicles and equipment access limited to designated roads/access tracks and cleared areas where possible	N/A		
	Implementation of a hot work permit system	Compliance with hot work permits		Hot work permit record system
	Smoking will be confined to designated smoking area only	N/A		Incident reporting system

2.3 Terrestrial Fauna

The management components to minimise impacts to Terrestrial Fauna are provided in Table 5.

Table 5 Terrestrial Fauna – management components

EPA factor and objective	Terrestrial Fauna: *To protect terrestrial fauna so that biological diversity and ecological integrity are maintained* (EPA 2021b)
CEMP objective	To minimise fauna habitat loss and minimise direct and indirect impacts to fauna as far as practicable
Key environmental values	Moderate and high value fauna habitat, significant fauna species and habitats
Key impacts and risks	• Loss of fauna habitat through clearing, including habitat for significance fauna species; • Fauna injury/death from vehicle strike/clearing activities; • Fauna activity disturbance from temporary increase in noise/vibration during construction; and • Bushfire resulting in damage/loss of surrounding fauna habitats

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
Clearing and ground disturbance				
Minimise fauna habitat loss	Clearing and ground disturbing activities limited to the defined clearing limits and boundaries described within approval document	Inspection of clearing extents during clearing activities to confirm no over clearing	Prior to construction	Report unauthorised clearing as soon as practicable after identified
	Vehicles and machinery to remain on designated roads/access tracks areas where possible		During construction	
	Vegetation 'avoidance areas' in close proximity to clearing activities will be clearly demarcated (e.g. with temporary flagging tape) prior to ground disturbing activities to prevent damage to vegetation outside of the approved disturbance area	Weekly inspections within the work area of 'avoidance areas' demarcation will be undertaken to confirm markings remain in place and are accurate		Inspection records

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
Fauna injury/death				
• No avoidable deaths of significant fauna during vegetation clearing for construction • Minimise fauna injury/death during Proposal construction	All site personnel to be inducted on environmental responsibilities	Record of all site personnel that have undertaken the induction	Prior to construction	Induction records
	Fauna identified within the demarcated clearing areas unable to move away from the clearing areas without intervention are be moved to a location deemed appropriate for the safety and survival of the fauna individual/s	Daily visual inspections for native fauna within open excavations not battered	During construction	Record known injuries to, or deaths of conservation significant fauna species in a Conservation Significant Fauna Interaction Register as soon as possible as the injury or death is identified Annual Compliance Reporting
	Clearing to be undertaken progressively in one direction to allow fauna to move on	N/A		
	• Excavation and trenches will be kept open only as long as needed for the works; • Where excavations required to be left open overnight, fauna egress points will be made; and • Trenches and excavations will be checked for trapped animals at the commencement of each work day	Daily inspections of excavations and trenches to identify trapped fauna and to enable capture and relocation		
	In the event vertebrate fauna is injured during clearing or construction, the animal shall be taken to an authorised veterinarian or trained wildlife carer, or if not practicable, humanely euthanized in accordance with DBCA SOPs			
	Observations of conservation significant fauna species by site personnel are to be reported to the site environment representative			

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
	Vehicles and equipment access limited to designated roads/access tracks and cleared areas where possible		At all times	
	Night-time vehicle movements during construction will be restricted where possible to minimise the potential for vehicle strikes			
	No pets, traps or firearms are allowed within the DE			
	No feeding or intentionally harming native fauna			
Disturbance to native fauna				
Minimise disturbance to native fauna from noise and vibration during Proposal construction	All site personnel to be inducted on environmental responsibilities	Record of all site personnel that have undertaken the induction	Prior to construction	Induction records
	In the event of significant noise activities (e.g. blasting) noise and vibration minimisation strategies (e.g. soft start) will be developed and implemented during Proposal construction	Compliance with implementation of noise and vibration minimisation strategies	During construction	Annual Compliance Reporting
Fire regimes				
No unplanned fires as a result of Proposal activities	All site personnel to be inducted on environmental responsibilities including fire prevention.	Record of all site personnel that have undertaken the induction	Prior to construction	Induction records
	All non-essential work is to be stopped or postponed in the event that a Total Fire Ban with Catastrophic fire danger ratings or Emergency Warning is issued for the Burrup Peninsula. Works to be conducted in accordance with all local fire control laws and regulations.	N/A	At all times	Incident reporting system

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
	Firefighting equipment to be present at all relevant work areas during construction activities	N/A		
	Vehicles and machinery to remain within designated roads/access tracks and cleared areas unless required by the work activity	N/A		
	Implementation of a hot work permit system	Compliance with hot work permits		Records of hot works undertaken
	Smoking will be confined to designated smoking area only	N/A		Incident reporting system

2.4 Social Surroundings

Management components to minimise impacts to social surroundings are provided in Table 6.

Table 6 Social Surroundings– management components

EPA factor and objective	Social Surroundings: *To protect social surroundings from significant harm* (EPA 2021b)
CEMP objective	To minimise impacts to heritage values and visual amenity
Key environmental values	Sites of Heritage significance and visual amenity
Key impacts and risks	• Potential indirect impacts to known Aboriginal cultural heritage sites and areas within the National Heritage Place as a result of vibration and dust deposition from ground preparation works during construction; and • Potential to impact upon amenity (visual, noise and vibration) • Potential for accidental direct impact to previously unrecorded Aboriginal cultural heritage Sites (that have the potential to be uncovered during ground disturbing activities).

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
Heritage Sites				
• No disturbance of known Aboriginal cultural heritage sites; and • Minimise disturbance of National Heritage Place	All site personnel to be inducted on environmental responsibilities	Record of all site personnel that have undertaken the induction	Prior to construction	Induction records
	Development of a Cultural Heritage Management Plan (CHMP) to guide clearing and ensure impacts to heritage sites are managed and minimised	Development of CHMP		• Incident reports • Induction records • Annual Compliance Reporting
	Prior to conducting ground disturbing activities, known heritage sites close to construction activities are to be demarcated via appropriate signage, fencing or flagging (where permitted by MAC)	Pre-ground disturbance inspection of known Aboriginal cultural heritage sites and National Heritage		

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
	'Avoidance areas' within the DE will be clearly established (e.g. by using temporary fencing or flagging tape) prior to ground disturbing activities to prevent damage to Aboriginal cultural heritage sites outside of the approved disturbance area	Place boundary to verify buffer and/or signage/fencing etc		
	Engagement of Aboriginal cultural heritage monitors through MAC to monitor all ground disturbing earthworks and to manage Aboriginal cultural heritage values of the site and the adjacent areas	• Visual inspections of heritage sites (MAC heritage monitors) during ground disturbance; and • Regular engagement with MAC	During construction	
	Ground disturbing activities, such as clearing or excavation must not occur within a 5 m buffer around each of the Aboriginal cultural heritage sites within the DE			
	• Any potential Aboriginal materials or other unexpected finds found on site during excavation, such as Aboriginal burials, will be subject to an immediate shutdown of activities and an exclusion zone of 5 m; • The Manager Sustainability will be immediately notified, and the Department of Planning, Lands and Heritage (DPLH) will be notified by Horizon Power; • DPLH will advise further management. An incident report will be lodged; • Horizon Power will consult with MAC and an archaeologist will be engaged to assess the archaeological material and provide a report to Horizon Power; and			

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
	• Horizon Power will work with MAC and the archaeologist to implement an appropriate course of action			
	Horizon Power will avoid, where possible, any moderate to large sized granite outcrops and creeks to maintain the environmental integrity of the Burrup Peninsula			
	Enable MAC Rangers to monitor the heritage places to enable knowledge transfer to occur and ensure the heritage values are protected for future generations		At all times	
	• Continue to engage and consult with MAC to ensure heritage values are managed; and • Regularly liaise with MAC to establish and maintain processes and accountability between the parties			
Dust				
Minimise dust deposition on Aboriginal cultural heritage sites	Dust suppression, including use of water carts to be implemented during construction activities in proximity to Aboriginal cultural heritage sites as required	• Visual inspections of heritage sites (by MAC heritage monitors) during ground disturbance; and • Ad hoc inspections of heritage sites (by MAC heritage monitors) during Proposal construction	During construction	• Incident reports • Annual Compliance Reporting
Noise and Vibration				
Minimise construction noise and vibration	All site personnel to be inducted on environmental responsibilities	• Record of all site personnel that have	Prior to construction	Induction records

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
		undertaken the induction		
	Construction works will be undertaken in accordance with the Environmental Protection (Noise) Regulations 1997	• Compliance with Environmental Protection (Noise) Regulations 1997 and/or approved Noise Management Plan; and • Investigation and reporting of all complaints	During construction	• Incident reports; • Complaint close-out; and • Annual Compliance Reporting
	Comply with local government noise management requirements			
	Establish a complaints register			
	Reduce noise emissions as much as practicable			
	Vibration to be minimised through planned blasting (guided by geotechnical assessment and risk assessment of vibration impact) and the designation of buffer zones as required			
	Heavy vehicle movements minimised as far as practicable			
Visual amenity				
Minimise adverse visual amenity	Maximise visual amenity through site layout design and construction materials, where possible	Investigation and reporting of all complaints	Prior to construction	• Annual Compliance Reporting; and • Complaint close-out
	Establish a complaints register		During construction	
Severe weather				
Ensure safety of site users and surrounding area in the event of severe weather	Cyclone warnings will be monitored by the Contractor and if a cyclone warning is issued, a site audit and clean-up will be undertaken prior to the cyclone. This will include filling in any holes, as well as stabilisation or dispersal of piles of dirt and removal of rubbish.	Severe weather checks and cyclone monitoring	During construction	Incident reports

2.5 Terrestrial Environmental Quality

Management components to minimise impacts to Terrestrial Environmental Quality are provided in Table 7.

Table 7 Terrestrial Environmental Quality– management components

EPA factor and objective	Terrestrial Environmental Quality: *To maintain the quality of land and soils so that environmental values are protected* (EPA 2021b)
CEMP objective	Minimise impacts from ASS and site contamination as far as practicable
Key environmental values	Portion of the DE is mapped as high risk of ASS
Key impacts and risks	• Exposure of ASS; • Soil erosion and sediment discharge; • Excavation of unexpected contamination; and • Accidental spills or leaks of hazardous materials or wastes

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
Acid Sulfate Soils				
No mobilization of ASS during construction	All site personnel to be inducted on environmental responsibilities	Record of all site personnel that have undertaken the induction	Prior to construction	Induction records
	• Prior to construction an ASS investigation will be undertaken in the areas proposed to be cleared and mapped as a high probability of ASS; and • Depending on the outcomes of the ASS investigation, an ASS management plan may be developed	As per the ASS management plan		• Inspection report; and • Approved ASS management plan if required

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
	Construction activities will be undertaken in accordance with the recommendations provided in the ASS investigation and/or ASS management plan		During construction	
Soil erosion and sediment discharge				
• No noticeable change in sediment discharge into drainage lines or within the tidal inlet between Hearson Cove and King Bay; and • No noticeable increase in soil erosion within the drainage lines or within the tidal inlet between Hearson Cove and King Bay	Establishment of designated access roads to prevent unauthorised disturbance	Routine inspections of erosion and sediment discharge within the drainage lines or within the tidal inlet between Hearson Cove and King Bay	At all times	• Inspection Report • Incident Report
	Erosion and sediment control measures will be applied to prevent erosion of exposed areas and sediment discharge to adjacent areas, where practicable		During construction	
	Laydown areas will be rehabilitated or otherwise stabilised as early as practicable to minimise the potential for erosion		Post construction	
Contamination				
All suspected contamination is characterised and appropriately managed	All site personnel to be inducted on environmental responsibilities	Record of all site personnel that have undertaken the induction	Prior to construction	• Induction records
	• In the event of excavation encountering suspected contaminated materials, the excavation works are to be stopped and advice sought from a qualified environmental professional; and	Visual monitoring during excavation	During construction	• Reporting of all suspected contamination; and • Contamination report from

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
	• If required, the suspected contamination will be sampled and analysed to determine the appropriate remediation and disposal			environmental professional
Hazardous materials and waste				
• All accidental spills or leaks of hazardous materials or waste is appropriately managed; and • Minimise the risk of spills or leaks of hazardous materials or waste	All site personnel to be inducted on environmental responsibilities	Record of all site personnel that have undertaken the induction	Prior to construction	Induction records
	Spill management procedures to be developed prior to construction	Record of storage and spill management procedures		• Inspection Report; and • Incident Report
	Hazardous materials used during construction will be stored in compliance with relevant Australian Standards and Regulations		At all times	
	On-site refueling of machinery and plant to occur on sealed or bunded areas and at least 50m away from all drainage lines or water bodies	Routine site inspections of hazardous materials and waste storage and handling areas to identify spills / leaks and discharges, and check that storage, handling and signage is appropriate		
	Scheduled / major maintenance of vehicles / plant to be undertaken off-site			
	Provision of spill response kits at refueling locations (if applicable – only temporary refueling equipment planned)			

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
	Safety Data Sheets (SDSs) and hazardous materials inventory to be retained on site			
	During construction, temporary ablution facilities to be self-contained. Sewage to be collected by a licensed contractor and disposed at an appropriately licensed waste facility			
	General construction waste material to be appropriately managed and disposed of off-site at an appropriate facility			

2.6 Marine Environmental Quality

The management components for marine environmental quality are outlined in Table 8.

Table 8 Marine Environmental Quality – management components

EPA factor and objective	Marine Environmental Quality: *To maintain the quality of water, sediment and biota so that environmental values are protected* (EPA 2021b)
CEMP objective	• To minimise impacts from erosion, sedimentation and contamination to the tidal inlet between Hearson Cove and King Bay
Key environmental values	• Intertidal adapted vegetation • Habitat for Migratory birds
Key impacts and risks	• Loss of intertidal adapted vegetation; • Loss of habitat for Migratory birds; • Excavation of ASS; • Soil erosion and sediment discharge; • Excavation of unexpected contamination; and • Accidental spills or leaks of hazardous materials or wastes

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
Vegetation and fauna habitat clearing				
Minimise the clearing of intertidal adapted vegetation located within the tidal inlet between Hearson Cove and King Bay	Proposal design to minimise the amount of poles and pole pads required to be located within the tidal inlet as much as possible	N/A	Prior to construction	Design records
	JHA or equivalent to include the risks and mitigation actions to be understood and adhered to as they pertain to the contractor and scope of work on the JHA	All relevant contractors to sign onto JHA or equivalent on a daily basis	During construction	JHA records

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
	Access tracks within the tidal area will be minimised, utilising existing access tracks were possible or coming direct from Burrup Road	Routine inspections of clearing areas within the tidal zone		• Inspection records • Annual Compliance Reporting • Report unauthorized clearing as soon as practicable after identified
	Refer to Table 4 and Table 5 for additional management targets, actions, monitoring, timing and reporting of management measures for flora and vegetation and terrestrial fauna			
Acid Sulfate Soils				
Minimise the risk of ASS mobilization within the tidal inlet between Hearson Cove and King Bay	Refer to Table 7 for additional management targets, actions, monitoring, timing and reporting of management measures for the excavation of ASS			
Soil erosion and sediment discharge				
Minimise the risk of soil erosion and sedimentation of the tidal inlet between Hearson Cove and King Bay	Refer to Table 7 for soil erosion and sediment discharge management targets, actions, monitoring, timing and reporting of management measures			
Contamination				
Minimise the risk of unexpected contamination within the tidal inlet	Refer to Table 7 for contamination management targets, actions, monitoring, timing and reporting of management measures			

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
between Hearson Cove and King Bay				
Hazardous materials and waste				
Minimise the risk of hazardous material and waste leaching into the tidal inlet between Hearson Cove and King Bay	Refer to Table 7 for hazardous materials and waste management targets, actions, monitoring, timing and reporting of management measures			

2.7 Inland Waters

Management components to minimise impacts to Inland Waters are provided in Table 9.

Table 9 Inland waters– management actions and targets

EPA factor and objective	Inland Waters: *To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected* (EPA 2021b)
CEMP objective	Minimise impacts to water quality of intermitted drainage lines and groundwater as far as practicable
Key environmental values	Intermitted drainage lines are located within the DE and the DE is located within the Pilbara Groundwater Area
Key impacts and risks	• Excavation of ASS; • Soil erosion and sediment discharge; • Accidental spills or leaks of hazardous materials or wastes; and • Construction works in the vicinity of drainage lines and the the tidal inlet between Hearson Cove and King Bay

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
Acid Sulfate Soils				
Minimise the risk of ASS mobilization and leaching into groundwater/surface water	Refer to Table 7 for management targets, actions, monitoring, timing and reporting of management measures for the excavation of ASS			
Soil erosion and sediment discharge				
Minimise the risk of soil erosion and sedimentation of drainage lines	Refer to Table 7 for soil erosion and sediment discharge management targets, actions, monitoring, timing and reporting of management measures			
Hazardous materials and waste				

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
Acid Sulfate Soils				
Minimise the risk of ASS mobilization and leaching into groundwater/surface water	Refer to Table 7 for management targets, actions, monitoring, timing and reporting of management measures for the excavation of ASS			
Minimise the risk of hazardous material and waste leaching into groundwater/surface water	Refer to Table 7 for Hazardous materials and waste management targets, actions, monitoring, timing and reporting of management measures			
Drainage lines				
Minimise impacts to drainage lines and the tidal inlet between Hearson Cove and King Bay	All site personnel to be inducted on environmental responsibilities	Record of all site personnel that have undertaken the induction	Prior to construction	Induction records
	Vegetation associated with natural drainage lines to be prioritised for protection through detailed design works	Routine inspections of clearing areas within drainage lines and the tidal inlet between Hearson Cove and King Bay		Inspection Report
	Natural drainage lines/creeks to be retained where possible		During construction	
	Vehicle movements to be restricted to designated access tracks			

2.8 Air Quality

The management components for air quality are outlined in Table 4.

Table 10 Air Quality – management components

EPA factor and objective	Air Quality: *To maintain air quality and minimise emissions so that environmental values are protected* (EPA 2021b)
CEMP objective	• Minimise impacts to air quality as a result of dust emissions generated during construction of the Proposal as far as practicable; and • Minimise impacts to air quality as a result of gaseous emissions generated during construction of the Proposal as far as practicable
Key environmental values	• Dampier township located 1.5 km west of the DE
Key impacts and risks	• Gaseous emissions generated during construction • Dust emissions generated during construction

Management Targets	**Management Actions**	**Monitoring**	**Timing/frequency of actions**	**Reporting**
Gaseous emissions				
Minimise gaseous emissions resulting from construction of the Proposal	All site personnel to be inducted on environmental responsibilities	Record of all site personnel that have undertaken the induction	Prior to construction	Site induction records
	Machinery and vehicles are regularly services and operated/maintained in accordance with the manufacturers specifications	N/A	At all times	N/A
	Vehicles on site will be switched off and not left idling when not in use			N/A
Dust emissions				

Management Targets	Management Actions	Monitoring	Timing/frequency of actions	Reporting
Minimise visible dust emissions resulting from construction of the Proposal	All site personnel to be inducted on environmental responsibilities	Record of all site personnel that have undertaken the induction	Prior to construction	Site induction records
	Use of water carts as needed to wet down dust generating surfaces such as roads, earthworks areas	N/A	During construction	N/A
	Earthworks activities will be restricted during high winds if dust cannot be adequately controlled	Routine monitoring of wind conditions		N/A
	Use of weather forecasting to predict extreme weather conditions likely to result in increased dust emissions so that Horizon Power can minimise the impact through application of additional dust controls or modified activities			
	Use of defined haul routes for machinery/vehicles travelling on unsealed surfaces or roads	N/A		N/A
	Reduced vehicle speed in areas of unconsolidated soil			
	Any complaints relating to dust emissions will be recorded and investigated as per Horizon Power's incident management procedure.			Complaints record

3 Adaptive management and review of the EMP

An adaptive management approach aims to reduce impacts by embedding a cycle of monitoring, reporting and implementing change, where required. This document applies the principles of adaptive management through monitoring, corrective actions and implementing changes.

3.1 Environmental monitoring and corrective actions

Internal monitoring of the environmental aspects outlined in this Plan will occur throughout the construction phase of the Proposal. Any non-conformances or incidents within this CEMP will be investigated, rectified or mitigated as soon as possible to ensure minimal ongoing environmental harm. Relevant procedures will be amended/updated as necessary and inductions and other workforce communication will be undertaken in a timely manner to minimise the risk of re-occurrences.

3.2 CEMP revision

This CEMP is intended to be dynamic and may be updated to reflect changes in management practices and the natural environment with time. This will also allow flexibility to adopt new technologies/management measures. Amendments to management actions and targets will be completed on an as needs basis. This will include revision/amendment of management actions that are not achieving the desired outcomes, monitoring identifying additional impacts and management actions, changes to relevant legislation or improvements to practices to achieve a greater environmental outcome.

3.3 Audits

An internal audit regime will be established for the duration of construction to assess compliance with this CEMP.

Where non-conformances with the CEMP are identified, these will be recorded and actions will be established to rectify the root cause of the non-conformance.

4 Stakeholder consultation

Horizon Power undertakes ongoing engagement with key stakeholders. These stakeholders include State Government Agencies and Departmental Ministers, Local Government, Traditional Owners and Corporate companies.

Horizon Power's ongoing consultation will continue throughout the construction phase and beyond, to ensure transparent and clear engagement informs our progress and that all concerns are addressed. Critically, Horizon Power have, and will, engage extensively with MAC and will continue to work with the local Aboriginal traditional owners throughout the Proposal process.

5 References

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GHD Pty Ltd (2019). Horizon Power 124-KRT-DMP 132kV Line Upgrade Project Flora and Fauna Survey. Unpublished report prepared for Horizon Power.

GHD Pty Ltd (2020a). Horizon Power Burrup Expansion Project Flora and Vegetation Survey. Unpublished report prepared for Horizon Power.

GHD Pty Ltd (2020b). Woodside Power Pty Ltd, Hybrid Renewable Power Plant Fauna Survey. Unpublished report prepared for Horizon Power.

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Scarp Archaeology (2022). Archaeological Survey, Horizon Power Burrup Transmission Line Project, Murujuga, Western Australia. Report prepared for Murujuga Aboriginal Corporation and Horizon Power.

Vicki Long and Associates (VLA) (2019). Woodside Power Project Flora and Vegetation Surveys Desktop Assessment Report. Unpublished report prepared for Horizon Power.

Attachment B: Ecological Survey Reports

See attached:

VLA, 2019. Woodside Power Project Flora and Vegetation Surveys (Desktop assessment report).

GHD, 2019. Horizon Power 124-KRT-DMP 132kV Line Upgrade Project (Flora and Fauna Survey).

GHD, 2020a. Horizon Power Burrup Expansion Project (Flora and Vegetation Survey)

GHD, 2020b. Woodside Power Pty Ltd – Hybrid Renewable Power Plant (Fauna Survey)

GHD, 2022. Technical Memorandum – Rev-0 Burrup Additional Areas Reconnaissance/Basic Survey

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Attachment C: Species likely to occur

Common Name / Species Name	EPBC Act Listing	BC Act / DBCA status	Assessment (likelihood of occurrence within the Project Area) & Justification
Northern Quoll (***Dasyurus hallucatus***)	Endangered	Endangered	**Likely to occur:** The preferred habitat for this species is rocky hills with exposed boulder piles and minor drainage lines near boulder piles (Woinarski, 2005; Hill and Ward, 2010; TSSC, 2005). The Northern Quoll is known to occur within the Burrup Peninsula in low numbers (Hill and Ward, 2010). The most recent record of this species within the Burrup Peninsula is from 2022; with the DBCA record in close proximity to the DE (< 100 m). Additionally, indigenous rangers present during a survey for the Proposed Action (GHD, 2020b) indicated remote camera records from the Burrup. Further, during this survey a large area of suitable habitat was recorded within the DE that links to suitable habitat beyond the DE (GHD, 2020b). Due to the known distribution of this species and the presence of suitable habitat the species is considered likely to occur within the DE.
Pilbara Olive Python (***Liasis olivaceus barroni***)	Vulnerable	Vulnerable	**Likely to occur:** The Pilbara Olive Python prefers escarpments, gorges, rocky outcrops and water holes in the ranges of the Pilbara region (Pearson, 1993). An important population of this species is known to occur within the Burrup Peninsula (Pearson, 2006). Further, there is a record of this species near the DE from 2015 (<100m). Additionally, a study for the Proposed Action found suitable habitat for the species (GHD, 2020b). Given the proximity of the Proposed Action to the Burrup Peninsula area and the presence of suitable habitat, it is considered likely that the Pilbara Olive Python is in or near the DE.
Ghost Bat (***Macroderma gigas***)	Vulnerable	Vulnerable	**May occur:** The Ghost Bat occurs across a wide range of habitat types and prefers undisturbed caves, deep fissures or disused mine shafts (Woinarski et al., 2014). The species' current range is discontinuous, with geographically distinct colonies occurring within the Pilbara region (McKenzie and Bullen, 2009). This species is known to occur within the region, however, has restricted habitats such as caves. These habitat types were not recorded in the fauna survey undertaken for the proposal (GHD, 2020b). Despite the lack of suitable roosting habitat within the area, the area may be used for foraging or dispersal by the species. Therefore, it is considered that this species may occur within the DE.
Grey Falcon (***Falco hypoleucos***)	Vulnerable	N/A	**May occur:** The Grey Falcon occurs in arid and semi-arid areas throughout Australia. Grey Falcons typically nest in the tallest trees along watercourse, particular river red gums, though they have also been observed to nest in communication towers (Marchant and Higgins, 1993). This species is known to occur in timbered lowland plains, tussock grasslands and open woodlands, and has been observed hunting in treeless areas (Garnett et al., 2011).

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Common Name / Species Name	EPBC Act Listing	BC Act / DBCA status	Assessment (likelihood of occurrence within the Project Area) & Justification
			The Grey Falcon was not recorded in the fauna survey undertaken for the project (GHD, 2020b). However, it is possible that the Grey Falcon may use areas within or near the DE for hunting; and therefore, it is considered the species may occur within the DE.
Curlew Sandpiper (*Calidris ferruginea*)	Critically Endangered	Critically Endangered	**May occur:** Curlew Sandpipers occur throughout coastal regions in Australia and are also occasionally located inland. In Western Australia, they are widespread within coast and sub-coastal plains from Cape Arid to the south-west of the Kimberly. In Australia, this species mainly occupies intertidal mudflats in sheltered coastal areas and can also be found around ephemeral and permanent lakes, dams and waterholes and bore drains (Higgins and Davies, 1996). This species has been recorded within 20 km of the survey area with suitable habitat found for the species near the survey area (GHD, 2020b). Therefore, it is considered the species may occur within the DE.
Eastern Curlew (*Numenius madagascariensis*)	Critically Endangered	Critically Endangered	**May occur:** The Eastern Curlew has a predominately coastal distribution, with a continuous population known to occur within the Dampier Archipelago. This species prefers habitats of estuaries, bays, harbours, inlets and coastal lagoons, saltwork and sewage farms, areas with beds of seagrass and occasionally ocean beaches, coral reefs, rock platforms and rocky inlets (Marchant and Higgins, 1993). This species is known to occur within the Dampier Archipelago region, and further has suitable habitat within the DE. Therefore, it is considered the species may occur within the DE.
Greater Sand Plover (*Charadrius leschenaultii*)	Vulnerable	Vulnerable	**May occur:** The Greater Sand Plover breeds in the northern hemisphere and undertakes annual migrations to and from the southern hemisphere feeding grounds for the austral summer. This species distribution in Australia during the non-breeding season is widespread, with majority of the species found in northern Australia (Bamford et al., 2008). This species mainly occupies coastal areas, inhabiting littoral and estuarine habitats. They often inhabit sheltered sandy or muddy beaches, large intertidal mudflats, sandbanks, salt marshes, coral reefs and rocky islands (Marchant and Higgins, 1993). The Greater Sand Plover has been known to occur within the region, with suitable habitat found adjacent to the survey area (GHD, 2020b). Therefore, it is considered the species may occur within the DE.
Lesser Sand Plover (*Charadrius mongolus*)	Critically Endangered	Endangered	**May occur:** The Lesser Sand Plover breeds in the northern hemisphere, where it takes annual migrations to and from the southern hemisphere feeding grounds for the austral summer. This species distribution in Australia is widespread and it has been recorded in all states (Bamford, 2008). This species mainly occupies coastal areas, preferring sandy beaches, mudflats or coastal bays and estuaries, sand-flats and dunes near the coast (del Hoyo et al., 1996). The Lesser Sand Plover is known to occur within the region and may opportunistically occur within the saltpans, therefore, it is considered the species may occur within the DE.

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Common Name / Species Name	EPBC Act Listing	BC Act / DBCA status	Assessment (likelihood of occurrence within the Project Area) & Justification
Red Knot ***Calidris canutus***	Endangered	Endangered	**May occur:** The Red Knot breeds in the northern hemisphere and undertakes migrations along the East Asian-Australian Flyaway (EAAF) to spend the boreal winter in Australia. Majority of this species spends its non-breeding winter period in Australia (Bamford et al., 2008). The Red Knot occupies all the main suitable habitats around the coast of Australia with scattered records of the species from the Kimberly region to Ningaloo in the north-west (Barrett et al., 2002). The Red Knot is known to occur within the region and may opportunistically occur within the saltpans, therefore, it is considered the species may occur in the DE.
Northern Siberian Bar-Tailed Godwit (***Limosa lapponica menzbieri***)	Critically Endangered	Protected under International Agreement	**May occur:** The Bar-tailed Godwit has been recorded in the coastal areas of all Australian states. In Western Australia it is spread across the coast, from Eyre to Derby. This species prefers habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays (Higgins and Davies, 1996). During non-breeding season, this species is mainly found in the north and north-west of Western Australia (Bamford et al, 2008). The mudflat with tidal inundation, mangrove, and supportive scattered samphire habitat was found within the DE, a suitable foraging habitat for the species. Therefore, it is considered the species may occur within the DE.
Australian Fairy Tern (*Sternula nereis nereis*)	Vulnerable	Vulnerable	**May occur:** The Australian Fairy Tern's distribution occurs along the coasts of New South Wales, Victoria, Tasmania, South Australia and Western Australia. Fairy Terns occupy a range of habits including offshore, estuarine or lacustrine (lake) islands, wetlands, beaches and spits (Higgins and Davies, 1996). The DE contains suitable habitat for this species, further there has been recent record of this species within the Dampier Archipelago area (Dunlop, 2018). Therefore, it is considered the species may occur within the DE.
Whimbrel (*Numenius phaeopus*)	Migratory	Protected under International Agreement	**Known to occur:** The Whimbrel prefers intertidal mudflats of sheltered coastal areas. This species is also found in harbour, lagoons, estuaries, and river deltas, often those with mangroves but also in unvegetated mudflats (Higgins and Davies, 1996). The species was recorded within the DE in the mudflat with tidal inundation, mangrove, and supportive scattered samphire habitat area during a recent survey (GHD, 2020b). Therefore, this species is known to occur within the DE.
Oriental Plover (*Charadrius veredus*)	Migratory	Protected under International Agreement	**Likely to occur:** Oriental Plovers spend their non-breeding season in northern Australia within coastal habitats such as estuarine mudflats and sandbanks, or sandy or rocky ocean beaches or nearby reefs, or near-coastal grasslands; before migrating further inland (Storr, 1980).

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Common Name / Species Name	EPBC Act Listing	BC Act / DBCA status	Assessment (likelihood of occurrence within the Project Area) & Justification
			The species is known to occur within the region and may opportunistically inhabit the suitable habitats found within the survey area (GHD, 2022); therefore, this species is considered to likely occur within the DE.
Wood Sandpiper (*Tringa glareola*)	Migratory	Protected under International Agreement	**May occur:** The Wood Sandpiper has its largest population recorded in north-west Australia, with nationally important areas for the species located in Western Australia including, Parry Floodplain, Camballin, Lake Argyle, Shark Bay, Vasse-Wonnerup estuary, Lake McLarty and Kogolup Lakes (Watkins, 1993). This species typically prefers well-vegetated, shallow, freshwater wetlands (such as swamps, billabongs, lakes, pools and waterholes). The Wood Sandpiper inhabits emergent, aquatic plants or grass, that is dominated by taller fringing vegetation, especially *Melaleuca* sp. and River Red Gums (Higgins and Davies, 1996). This species has previously been recorded in the area however are rarely found using brackish wetlands, therefore it is considered the species may be present within the DE.
Oriental Pratincole (*Glareola maldivarum*)	Migratory	Protected under International Agreement	**Likely to occur:** Within Australia, the Oriental Pratincole is distributed widely throughout the northern areas, especially along the Pilbara Region in Western Australia (Barrett et al., 2003). In the non-breeding season the species occupies the following habitats in Australia; open plains, floodplains or short grasslands, often with extensive bare areas. The are often found near terrestrial wetlands, such as billabongs, lakes and artificial wetlands. The species also habits areas along the coast, including beaches, mudflats and islands (Jaensch, 2004). This species has previously been recorded in the area and a recent survey found suitable Mudflat with tidal inundation, Mangroves and supportive scattered Samphire habitat present (GHD, 2019); therefore, it is considered likely for this species to be present within the DE.
Common Sandpiper (*Actitis hypoleucos*)	Migratory	Protected under International Agreement	**Likely to occur:** The Common Sandpiper occupies areas along coastlines of Australia and also inland areas. The population in Australia is mainly found in the northern and western parts of Australia (Higgins and Davies, 1996). This species prefers habits within coastal wetlands and some inland wetlands and is mostly found within muddy margins or rocky shores. Further, this species is often located near mangroves (Higgins and Davies, 1996). This species has previously been recorded within the area and a recent study found suitable Mudflat with tidal inundation, Mangroves and supportive scattered Samphire habitat present (GHD, 2020b); therefore, it is considered likely for this species to be present within the DE.
Common Greenshank (*Tringa nebularia*)	Migratory	Protected under International Agreement	**Likely to occur:** The Common Greenshank occurs around most of the coast in Western Australia, from Cape Arid in the south to Carnarvon in the north-west (Higgins and Davies, 1996).

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Common Name / Species Name	EPBC Act Listing	BC Act / DBCA status	Assessment (likelihood of occurrence within the Project Area) & Justification
			This species occupies a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. In sheltered habitats, it is found in areas with large mudflats, saltmarshes, mangroves or seagrass. This species has previously been recorded within the area and a recent study found suitable Mudflat with tidal inundation, Mangroves and supportive scattered Samphire habitat present (GHD, 2020b); therefore, it is considered likely for this species to be present within the DE.
Gull-billed Tern (*Gelochelidon nilotica*)	Migratory	Protected under International Agreement	**Known to occur:** The Gull-billed Tern is a migratory species in Australia, often inhabiting freshwater swamps, brackish and salt lakes, beaches and estuarine mudflats, floodwaters, artificial wetlands and grasslands (Morcombe, 2004). This species was recorded within the mudflat with tidal inundation, mangrove and supportive scattered samphire habitat area during a recent survey (GHD, 2020b); and is therefore known to occur within the DE.
Caspian Tern (*Hydroprogne caspia*)	Migratory	Protected under International Agreement	**Known to occur:** In Western Australia, the Caspian Tern is widespread in coastal regions, from the Great Australian Bight to the Dampier Peninsula. This species occupies sheltered coastal embankments and those with sandy or muddy margins are preferred. They also are found on near-coastal and inland terrestrial wetlands, especially lakes, waterholes, reservoirs, rivers and creeks (Higgins and Davies, 1996). This species was recorded within the mudflat with tidal inundation, mangrove and supportive scattered samphire habitat area during a recent survey (GHD, 2020b); and is therefore known to occur within the DE.
Crested Tern (*Thalasseus bergii*)	Migratory	Protected under International Agreement	**Known to occur:** The Crested Tern species is common to coastal regions of Australia, with the species' preferred habitat being coastal and offshore waters including beaches, bays, inlets, tidal rivers, swamps and lakes (Higgins and Davies, 1996). This species was recorded within the mudflat with tidal inundation, mangrove and supportive scattered samphire habitat area during a recent survey (GHD, 2020b); and is therefore known to occur within the DE.
Bridled Tern (*Onychoprion anaethetus*)	Migratory	Protected under International Agreement	**Likely to occur:** In Western Australia, the Bridled Tern is known to breed from the islands off Cape Leeuwin north to Shark Bay and in the Pilbara regions (including the Dampier Archipelago) and Kimberly. This species occupies tropical and subtropical seas, breeding on islands and rarely in inshore continental waters along mainland coastlines (Higgins and Davies, 1996). Tussock grasslands on cracking clays and mudflat with tidal inundation, Mangroves and supportive scattered Samphire habitats were recorded during a recent survey (GHD, 2020b); therefore, this species is considered likely to occur within the DE.
Lined soil-crevice skink (Dampier)	N/A	Priority 4	**Likely to occur:**

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Common Name / Species Name	EPBC Act Listing	BC Act / DBCA status	Assessment (likelihood of occurrence within the Project Area) & Justification
(*Notoscincus butleri*)			The Lined Soil-crevice Skink is distributed within the Pilbara region within Western Australia, with its preferred habitat being stony grasslands (Teale et al., 2017). The species is known to occur within the area, with five historical records of the species within 2 km of the DE (GHD, 2020b). Further, suitable habitat of minor drainage lines with cracking clays and/or stony soils was recorded within the survey for the project (GHD, 2020b). Therefore, the species is considered likely to occur within the DE.
Northern short-tailed mouse (*Leggadina lakedownensis*)	N/A	Priority 4	**May occur:** The Northern Short-tailed Mouse occurs across northern Australia, from Cape York to the Pilbara within Western Australia. The species prefers sandy soils on cracking clays within Western Australia (DBCA). The species has previously been recorded within the survey area, with three historical records within 2 km of the survey area (GHD, 2020b). Further, suitable habitats are present within the DE, particularly the minor drainage lines (GHD, 2020b). Therefore, it is considered the species may occur within the DE.
North-western free-tailed bat (*Mormopterus cobourgianus*)	N/A	Priority 1	**Known to occur:** The North-western Free-tailed Bat is distributed within the Pilbara region along coastal regions, with its preferred habitat including mangroves and adjoining areas (Reardon et al., 2017). Suitable habitat was found during a survey of the project within the DE, with the species calls recorded (GHD, 2020b). Therefore, this species is known to occur within the DE.
Peregrine falcon (*Falco peregrinus*)	N/A	Other Specially Protected Fauna	**Likely to occur:** The Peregrine Falcon is found across Australia and occupies most habitat from rainforests to arid zones. It prefers coastal and inland cliffs or open woodland areas near water (BirdLife, 2023). Suitable foraging habitats were found within the DE during a study for the project (GHD, 2020b and GHD, 2022). With five previous recordings within the survey area (GHD, 2020b) this species is considered likely to occur.
Water-rat, rakali (*Hydromys chrysogaster*)	N/A	Priority 4	**May occur:** The Water Rat is distributed around Australia in fresh or brackish water and coastal habitats in the south-west and Kimberly's of WA, though has also been found in marine environments along the Pilbara coastline (DEC, 2012). In the south-west of WA they prefer habitat with riparian vegetation, better water quality and a degree of habitat complexity. The species is known to occur within the Burrup Peninsula, with marginally suitable habitat found (GHD, 2022) within the DE. Therefore, it is considered the species may occur within the DE.