Burrup Common User Transmission Infrastructure

EP Act Section 38 – Referral Supporting Document

11/11/2022

HORIZON POWER

Document control

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

Executive Summary

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 expand the North West Interconnected System (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.

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.

Pole placement and span for the transmission line is flexible, with the final location of infrastructure subject to detailed design, avoidance of known Aboriginal cultural heritage sites and consideration of any additional information determined by Aboriginal cultural heritage monitoring during initial ground disturbing works.

The Proposal has also been designed to limit impacts to Flora and Vegetation, and Terrestrial Fauna. Final design of the Proposal will limit (where possible) direct and indirect impacts to identified environmental values.

Horizon Power is referring the Proposal to the Western Australia (WA) Environmental Protection Authority (EPA) under Part IV (Section 38) of the *Environmental Protection Act 1986* (EP Act), as the Proposal is a significant Proposal that has the potential to impact on one or more of the EPA's key environmental factors. The purpose of this document is to provide additional information to support the referral submission.

The following EPA factors are considered key environmental factors for the Proposal:

- Flora and Vegetation;
- Terrestrial Fauna; and
- Social Surroundings.

An additional six factors have been identified as 'other environmental factors' for the Proposal, including:

- Greenhouse Gas (GHG) Emissions;
- Air Quality;
- Inland Waters;
- Terrestrial Environmental Quality;
- Coastal Processes; and
- Marine Environmental Quality.

It is considered that all factors can be managed through avoidance and mitigation measures to meet the EPA's objectives. Tables ES-1 and ES-2 summarise the Proposal as required under current EPA guidance. Table ES-3 provides a summary of potential impacts of the Proposal, proposed mitigation and anticipated environmental outcomes for key environmental factors.

Table ES-1 General Proposal content description

Proposal title	Burrup Common User Transmission Infrastructure
Proponent name	Horizon Power
Short description	Horizon Power is proposing to construct common user transmission infrastructure to enable the supply of grid electricity to the Burrup Strategic Industrial Area (SIA). The Proposal includes construction of an approximately 7 km long, 132 kV overhead transmission line between the Dampier substation and the Burrup SIA, access tracks along the transmission line route, extension of the existing Dampier substation (inclusive of 132 kV switchgear, fencing and ancillary equipment), construction of a new Burrup substation (inclusive of 33 kV and 132 kV switchgear, large scale battery, transformers, fencing and ancillary equipment) and installation of associated infrastructure to facilitate the safe and reliable ongoing operation of the new infrastructure.

Table ES-2 Proposal content elements

Proposal element	Location / description	Maximum extent, capacity or range
Physical elements		
Burrup Common User Transmission Infrastructure	Located in Murujuga (Burrup Peninsula) WA. See Figure 2-1 and Figure 2-2.	Disturbance of up to 14.40 ha of native vegetation within an 85.61 ha Development Envelope (DE).
Construction elements		
Burrup Common User Transmission Infrastructure	See Figure 2-2.	Disturbance of up to 14.40 ha of native vegetation within an 85.61 ha DE to accommodate the following permanent and temporary project elements. **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.
Operational elements		
Burrup Common User Transmission Infrastructure	See Figure 2-2.	• Operation of the Burrup substation; • Ongoing operation of the Dampier substation (existing site that will be expanded); • Operation of an approximately 7 km long 132 kV overhead transmission line; and • Operation of associated electrical infrastructure supporting the Burrup Common User Transmission Infrastructure.
Proposal elements with greenhouse gas emissions		
Construction elements:		
Scope 1	1,572 tCO_2-e	
Scope 2	N/A	
Scope 3	2,144 tCO_2-e	
TOTAL	**3,716 tCO_2-e**	
Operation elements:		
Scope 1	36 tCO_2-e	
Scope 2	1,595 tCO_2-e	
Scope 3	28 tCO_2-e	
TOTAL	**1,659 tCO_2-e**	
Rehabilitation		
At the completion of the construction phase, temporary construction/laydown areas will be rehabilitated (refer to the Construction Environmental Management Plan [CEMP], Appendix 1). Permanent disturbance		

associated with the Proposal will include electrical assets and associated infrastructure, access tracks and pole access pads.		
Commissioning		
No commissioning phase is required for the Proposal.		
Decommissioning		
The operational elements of the Proposal will be permanent infrastructure of the NWIS. Should the infrastructure associated with the Proposal be no longer required, the infrastructure will be decommissioned and removed as far as reasonably practical.		
Other elements which affect extent of effects on the environment		
Proposal time	Maximum project life	The operational elements of the Proposal will be permanent infrastructure (i.e. no maximum project life).
	Construction phase	The construction phase of the Proposal is estimated to take two years subject to approvals.
	Operations phase	The operational elements of the Proposal will be permanent infrastructure.
	Decommissioning phase	N/A.

Table ES-3 Summary of potential impacts, proposed mitigation and proposed environmental outcomes

Flora and Vegetation	

Potential impacts	• Native vegetation:
	  ○ Clearing of up to 14.40 ha of native vegetation (including 11.50 ha of permanent clearing and 2.90 ha of temporary clearing) including:
	  ▪ Native vegetation across thirteen VTs;
	  ▪ Native vegetation mapped across Vegetation Association 117; and
	  ▪ Native vegetation mapped across the Granitic and Littoral Land Systems.
	  ○ Clearing of up to 2.5 ha of riparian vegetation (indicative clearing in current design of approximately 0.72 ha);
	  ○ Clearing of up to 1.5 ha of vegetation located within the Hearson Cove and King Bay (indicative clearing in current design of approximately 0.47 ha); and
	  ○ In the unlikely event that construction of the Proposal is constrained by Aboriginal cultural heritage within the northern quarter of the DE (i.e. an unexpected find during initial ground disturbing works), minor impacts to the Burrup Peninsula rock pile communities PEC (up to 0.05 ha) may be required.
	• Clearing of significant flora individuals, including:
	  ○ Clearing of up to 19 individuals of *Terminalia supranitifolia* (Priority 3);
	  ○ Clearing of up to six individuals of *Rhynchosia bungarensis* (Priority 4); and
	  ○ Indirect impacts such as Introduction and/or the spread of weeds, Alteration of fire regimes, alteration to hydrological flows, spills or leaks of chemical, hydrocarbon and/or hazardous materials. These impacts will be avoided and mitigated through detailed design planning and standard construction management measures, including the implementation of a CEMP.

Mitigation hierarchy	<u>Avoid</u> • Pole placement and span has been designed to avoid impacts to vegetation (including PECs) and flora where possible; • Pole placement, access tracks and other clearing has been designed to avoid impact to identified aboriginal heritage sites or areas of concern; • No-go zones have been developed to avoid impacts to vegetation (including PECs) and flora where possible; and • Use of existing cleared access tracks where possible, to avoid and reduce the amount of native vegetation clearing required. <u>Minimise</u> • Clearing for unsealed access tracks has been optimised to a minimum trafficable width; • Clearing impacts will be further reduced through the detailed design process, including the positioning of access tracks, poles and pole pads to minimise impacts to vegetation (including PECs) and flora; • Any clearing of a temporary nature will be rehabilitated upon completion of construction; • Pole placement will avoid drainage lines, where possible, minimising impacts to riparian 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 and flora within this area; • Pole locations utilise the proposed Burrup Road realignment (to be implemented by Main Roads), reducing the amount of clearing required for access tracks; and • Implementation of the management measures in the Construction Environment Management Plan (CEMP) (Appendix 1) to minimise risks to vegetation and flora, and to provide monitoring during construction. <u>Rehabilitate</u> • Any clearing required for temporary construction purposes, and not required for ongoing operations, will be rehabilitated upon completion of construction.
Residual impacts, including assessment of significance	Direct and indirect impacts to flora and vegetation associated with the Proposal are not expected to be significant. These impacts can be managed through Horizon Power's mitigation and management measures, and the implementation of the CEMP prepared for the Proposal (Appendix 1).
Proposed environmental outcomes	The Proposal is not expected to result in significant residual impacts to flora and vegetation. The Proposal requires clearing of up to 14.40 ha of native vegetation (of which 2.90 ha is temporary clearing and will be rehabilitated), including up to 2.50 ha of riparian vegetation and up to 1.50 ha of other significant vegetation. Following rehabilitation of the up to 2.90 ha required for temporary works, the residual amount of native vegetation to be cleared will be up to 11.50 ha. The Proposal also requires the removal of up to six individuals of *Rhynchosia bungarensis* (Priority 4) and up to 19 individuals of *Terminalia supranitifolia* (Priority 3). Indirect impacts are considered to include the introduction and/or spread of weeds, alteration of fire regimes, alteration to hydrology and spills or leak of chemical, hydrocarbon and/or hazardous materials.

Assessment of offsets (if relevant)	N/A
Terrestrial Fauna	

Potential impacts	• Clearing of up to 14.40 ha of fauna habitat (including 11.50 ha of permanent disturbance and 2.90 ha for temporary disturbance) across five fauna habitats, including habitat suitable for:
	  ○ Two significant fauna species recorded within the wider GHD (2020b) survey area; and
	  ○ An additional fifteen species with the potential to occur within the DE.
	• Indirect impacts such as fauna injury/death from vehicle strike/clearing activities, fauna activity disturbance from temporary increase in noise/vibration during construction.

Mitigation hierarchy	<u>Avoid</u> • Pole placement and span has been designed to avoid impacts to fauna habitat (including PECs and the clearing of high-quality habitat) where possible; • No-go zones have been developed to avoid impacts to fauna habitat (including PECs and the clearing of high-quality habitat) where possible; • Presence of a fauna spotter / handler during clearing activities to supervise avoidance, dispersal and relocation of any fauna; and • Use of existing cleared access tracks where possible, to avoid and reduce the amount of fauna habitat clearing required. <u>Minimise</u> • Clearing for unsealed access tracks has been reduced to a trafficable width of approximately 4 m; • Clearing impacts will be further reduced through the detailed design process, including the positioning of access tracks, poles and pole pads to minimise impacts to fauna habitat (including PECs and high-quality habitat); • 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; • Pole locations utilise the proposed Burrup Road realignment (to be implemented by Main Roads), reducing the amount of fauna habitat clearing required for access tracks; • Dust, noise and vibration management measures will be implemented during construction; and • Implementation of the management measures in the CEMP (Appendix 1) to minimise risks to terrestrial fauna, and to provide monitoring during construction. <u>Rehabilitate</u> • Any clearing required for temporary disturbance will be rehabilitated upon completion of construction.
Residual impacts, including assessment of significance	Direct and indirect impacts to terrestrial fauna associated with the Proposal are not expected to be significant. These impacts can be managed through Horizon Power's mitigation and management measures, and the implementation of the CEMP prepared for the Proposal (Appendix 1).

Proposed environmental outcomes	The Proposal is not expected to result in significant residual impacts to terrestrial fauna. The Proposal requires clearing of up to 14.40 ha of fauna habitat (of which up to 2.90 ha is temporary clearing and will be rehabilitated). Following rehabilitation of the up to 2.90 ha required for temporary works, the residual amount of fauna habitat to be cleared will be up to 11.50 ha. The Proposal will require the removal of fauna habitat that is potentially suitable for significant fauna species, however this impact is not expected to be significant. Design of the Proposal will be refined to minimise impacts to rock piles, drainage and mudflat fauna habitats. Direct impacts are considered to include fauna injury/death from vehicle strike. Indirect impacts are considered to include fauna disturbance from increased noise and vibration. Horizon Power considers that the potential impacts to terrestrial fauna (with implementation of the avoidance and mitigation measures proposed to address those potential impacts) will meet the EPA's objective for terrestrial fauna.
Assessment of offsets (if relevant)	N/A
Social Surroundings	

Potential impacts	• Aboriginal cultural heritage:
	  ○ No direct disturbance to all known Aboriginal cultural heritage sites, and to guarantee their protection 'no-go zones' developed within the DE; and
	  ○ Potential indirect impacts to Aboriginal cultural heritage through dust generation, vibrations and accidental fires during construction or operations.
	• National and European heritage:
	  ○ Construction of the Proposal will directly disturb land within National Heritage Place 'Dampier Archipelago (including Burrup Peninsula)' (Place No. 105727);
	  ○ Construction of the Proposal will directly disturb land within municipal heritage site, 'Dampier Archipelago (including Burrup Peninsula)' (ID: 25086);
	  ○ Potential indirect impacts to National and European heritage through dust generation, vibrations and accidental fires during construction or operations; and
	  ○ The Proposal is cognisant of the current World Heritage nomination for the Murujuga area, and will take measures to avoid impacts to noted heritage values within the DE.
	• Amenity:
	  ○ The Proposal has the potential to impact on the visual amenity of the local area, noting that proposed infrastructure is consistent with existing transmission infrastructure in the region; and
	  ○ Potential indirect impacts to amenity through dust generation, vibrations and accidental fires during construction or operations.

Mitigation hierarchy	<u>Avoid</u> • Site selection for DE has taken into account CBG (2020 – CONFIDENTIAL REPORT) recommendation that 'development south of Burrup Road be avoided'. Extensive consultation has 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); • Modification of the Proposal footprint to avoid direct impacts to known Aboriginal cultural heritage sites, mapped during the Aboriginal cultural heritage surveys undertaken within the DE; • Modification of the Proposal footprint to avoid direct impacts to rock piles as far as practicable; • Use of helicopters for stringing (at some locations) to minimise ground disturbance; and • The inclusion of no-go zones within the DE. <u>Minimise</u> • Aboriginal cultural heritage monitors (as appointed by MAC) will be present during initial ground disturbing works; • Construction activities will avoid, where possible, any moderate to large sized granite outcrops and creeks; • Horizon Power will develop a Cultural Heritage Management Plan (CHMP) (engaging MAC in the preparation and review of the CHMP); • Aboriginal cultural heritage sites will be visibly demarcated during construction (where works are nearby) to prevent inadvertent impacts (where permitted by MAC); • Development of 'administrative work packs' for Aboriginal cultural heritage sites close to work areas to monitor their condition (pre and post construction); and • Dust, vibrations and fire risk will be managed in accordance with the CEMP. <u>Rehabilitate</u> N/A
Residual impacts, including assessment of significance	Based on the impacts identified and the mitigation proposed, the Proposal is not expected to have a significant residual impact on social surroundings.
Proposed environmental outcomes	Not significant. The implementation of appropriate management and mitigation detailed in the Proposal environmental management plans will minimise any potential impact to social aspects.
Assessment of offsets (if relevant)	N/A

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Appendices

Abbreviation	Definition
AHA	*Aboriginal Heritage Act 1972*
AHIS	Aboriginal Heritage Inquiry System
ASS	Acid Sulfate Soils
BC Act	*Biodiversity Conservation Act 2016*
BMIEA	Burrup and Maitland Industrial Estates Agreement
CEMP	Construction Environmental Management Plan
CHMP	Cultural Heritage Management Plan
DAWE	Department of Agriculture, Water and the Environment
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DBCA	Department of Biodiversity Conservation and Attractions
DE	Development Envelope
DevWA	Development WA
DPC	Department of Premier and Cabinet
DPIRD	Department of Primary Industries and Regional Development
DPLH	Department of Planning, Lands and Heritage
EOPA	*Energy Operators (Powers) Act 1979*
EPA	Environmental Protection Authority
EP Act	*Environmental Protection Act 1986*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ESA	Environmentally Sensitive Area
FMG	Fortescue Metals Group
GHG	Greenhouse Gas
GTE	Government Trading Entity
IBRA	Interim Biogeographic Regionalisation of Australia
ILUA	Indigenous Land Use Agreement
JTSI	Department of Jobs, Tourism, Science, and Innovation
Km	Kilometre
kV	Kilovolt
LGA	Local Government Authority
LNG	Liquified natural gas
MAC	Murujuga Aboriginal Corporation

MNES	Matters of National Environmental Significance
MRWA	Main Roads Western Australia
Murujuga	Burrup Peninsula
MW	Megawatts
NAC	Ngarluma Aboriginal Corporation
NVCP	Native Vegetation Clearing Permit
NWIS	North-West Interconnected System
PEC	Priority Ecological Community
PNAC	Pilbara Networks Access Code
S38	Section 38
SIA	Strategic Industrial Area
SRE	Short-Range Endemic
TEC	Threatened Ecological Community
Yara	Yara Australia
VT	Vegetation type
WoNS	Weed of National Significance

1 Introduction

1.1 Summary

The North-West Interconnected System (NWIS) is located within the Pilbara region and comprises a number of interconnected electricity networks with different owners. The three largest participants in the NWIS are Horizon Power (Government Trading Entity, GTE), Alinta Energy and Rio Tinto (which are privately owned). The Pilbara Networks Access Code (PNAC) is the key instrument that governs access to lightly regulate the NWIS.

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.

1.2 Scope and purpose of this document

The Proposal is being referred to the WA Environmental Protection Authority (EPA) under Part IV (Section 38 [s38]) of the *Environmental Protection Act 1986* (EP Act), as the Proposal is a significant Proposal that has the potential to impact on one or more of the EPA's key environmental factors. Horizon Power is also referring the Proposal to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW, formerly the Department of Agriculture, Water and the Environment [DAWE]) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as the Proposal has the potential to impact Matters of National Environmental Significance (MNES). The purpose of this document is to support Horizon Power with their referral submission to the EPA.

The following EPA factors are considered preliminary key environmental factors for the Proposal:

- Flora and Vegetation;

- Terrestrial Fauna; and
- Social Surroundings.

An additional six factors have been identified as 'other environmental factors' for the Proposal, including:

- Greenhouse Gas (GHG) Emissions;
- Air Quality;
- Inland Waters;
- Terrestrial Environmental Quality;
- Coastal Processes; and
- Marine Environmental Quality.

This supporting document has been prepared in accordance with the 'Environmental Impact Assessment (Part IV Division 1 and 2) Administrative Procedures 2021' (EPA 2021a) and 'Procedures Manual' (EPA 2021b), and the 'Instructions for the referral of a Proposal to the EPA under Section 38 of the EP Act' (EPA 2021c) to inform the EPA and DCCEEW consideration of the referral.

Consistent with the EPA instructions for referral, this supporting document is structured according to the 'Instructions on how to prepare an Environmental Review Document' (EPA 2021d). This document details the key characteristics of the Proposal and provides an environmental impact assessment against the EPA's environmental factors and relevant MNES. The assessment summarises:

- The EPA environmental factors and MNES that may potentially be impacted;
- Relevant policy and guidance that has been considered;
- The condition of the receiving environment;
- Potential environmental impacts and risks associated with the Proposal;
- Proposed management and mitigation measures; and
- Outcomes of stakeholder consultation.

1.3 Proponent

The proponent for this Proposal is Horizon Power. Contact details are provided in Table 1-1.

Table 1-1 Proponent contact details

Contact	Details
Horizon Power	ABN: 57 9550 116 97 Address: 18 Brodie Hall Drive Technology Park, Bentley WA 6102
Proposal key contact	Name: Maurice Ryan Position: Project Director Email: Maurice.Ryan@horizonpower.com.au Phone: (08) 6310 1912

2 Proposal

2.1 Proposal content

Horizon Power is proposing to develop a 132 kV overhead transmission line between the Dampier substation and the proposed Burrup substation, on the Burrup Peninsula, WA.

A summary of the Proposal content description and Proposal content elements is included in Table 2-1 and Table 2-2, respectively.

Table 2-1 General Proposal content description

Proposal title	Burrup Common User Transmission Infrastructure
Proponent name	Horizon Power
Short description	Horizon Power is proposing to construct common user transmission infrastructure to enable the supply of grid electricity to the Burrup Strategic Industrial Area (SIA). The Proposal includes construction of an approximately 7 km long, 132 kV overhead transmission line between the Dampier substation and the Burrup SIA, clearing of unsealed access tracks along the transmission line route, an extension of the existing Dampier substation (inclusive of 132 kV switchgear, fencing and ancillary equipment), construction of a new Burrup substation (inclusive of 33 kV and 132 kV switchgear, large scale battery, transformers, fencing and ancillary equipment) and installation of associated electrical infrastructure to facilitate the safe and reliable ongoing operation of the new infrastructure (inclusive of earthing and augmentation of the existing distribution network adjacent Burrup substation).

Table 2-2 Proposal content elements

Proposal element	Location/description	Maximum extent, capacity or range
Physical elements		
Burrup Common User Transmission Infrastructure	Located in Murujuga (Burrup Peninsula) WA. See Figure 2-1 and Figure 2-2.	Disturbance of up to 14.40 ha of native vegetation within an 85.61 ha Development Envelope (DE).
Construction elements		
Burrup Common User Transmission Infrastructure	See Figure 2-2.	Disturbance of up to 14.40 ha of native vegetation within an 85.61 ha DE to accommodate the following permanent and temporary project elements. **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.
Operational elements		
Burrup Common User Transmission Infrastructure	See Figure 2-2.	• Operation of the Burrup substation; • Ongoing operation of the Dampier substation (existing site that will be expanded); • Operation of an approximately 7 km long 132 kV overhead transmission line; and • Operation of associated electrical infrastructure supporting the Burrup Common User Transmission Infrastructure.
Proposal elements with greenhouse gas emissions		
Construction elements:		
Scope 1	1,572 tCO_2-e	
Scope 2	N/A	
Scope 3	2,144 tCO_2-e	
TOTAL	**3,716 tCO_2-e**	
Operation elements:		
Scope 1	36 tCO_2-e	
Scope 2	1,595 tCO_2-e	
Scope 3	28 tCO_2-e	
TOTAL	**1,659 tCO_2-e**	
Rehabilitation		
At the completion of each construction phase, temporary construction/laydown areas will be rehabilitated (refer to the CEMP, Appendix 1). Permanent disturbance associated with the Proposal will include electrical assets and associated infrastructure, access tracks and pole access pads.		
Commissioning		
No commissioning phase is required for the Proposal.		
Decommissioning		
The operational elements of the Proposal will be permanent infrastructure of the NWIS. Should the infrastructure associated with the Proposal be no longer required, the infrastructure will be decommissioned and removed as far as reasonably practical.		

Other elements which affect extent of effects on the environment		
Proposal time*	Maximum project life	The operational elements of the Proposal will be permanent infrastructure (i.e. no maximum project life).
	Construction phase	The construction phase of the Proposal is estimated to take two years subject to approvals.
	Operations phase	The operational elements of the Proposal will be permanent infrastructure.
	Decommissioning phase	N/A.

The 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.

The Proposal location and DE are shown on Figure 2-1, and the indicative Disturbance Footprint on Figure 2-2. Horizon Power remain flexible with the Proposal design (specifically pole placement and span) therefore, the Disturbance Footprint shown on Figure 2-2 is indicative only and subject to change as the design develops. Horizon Power will continue to refine the design of the Proposal to ensure the poles are placed in locations which will minimise impacts to environmental and heritage values where possible. To ensure the Proposal avoids impacts to significant environmental and heritage values identified within the Burrup, 'no-go zones' have been developed within the DE (Figure 2-2). The final design of the Proposal will avoid these 'no go zones' to minimise impacts to environmental and Aboriginal cultural heritage values as much as possible.

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

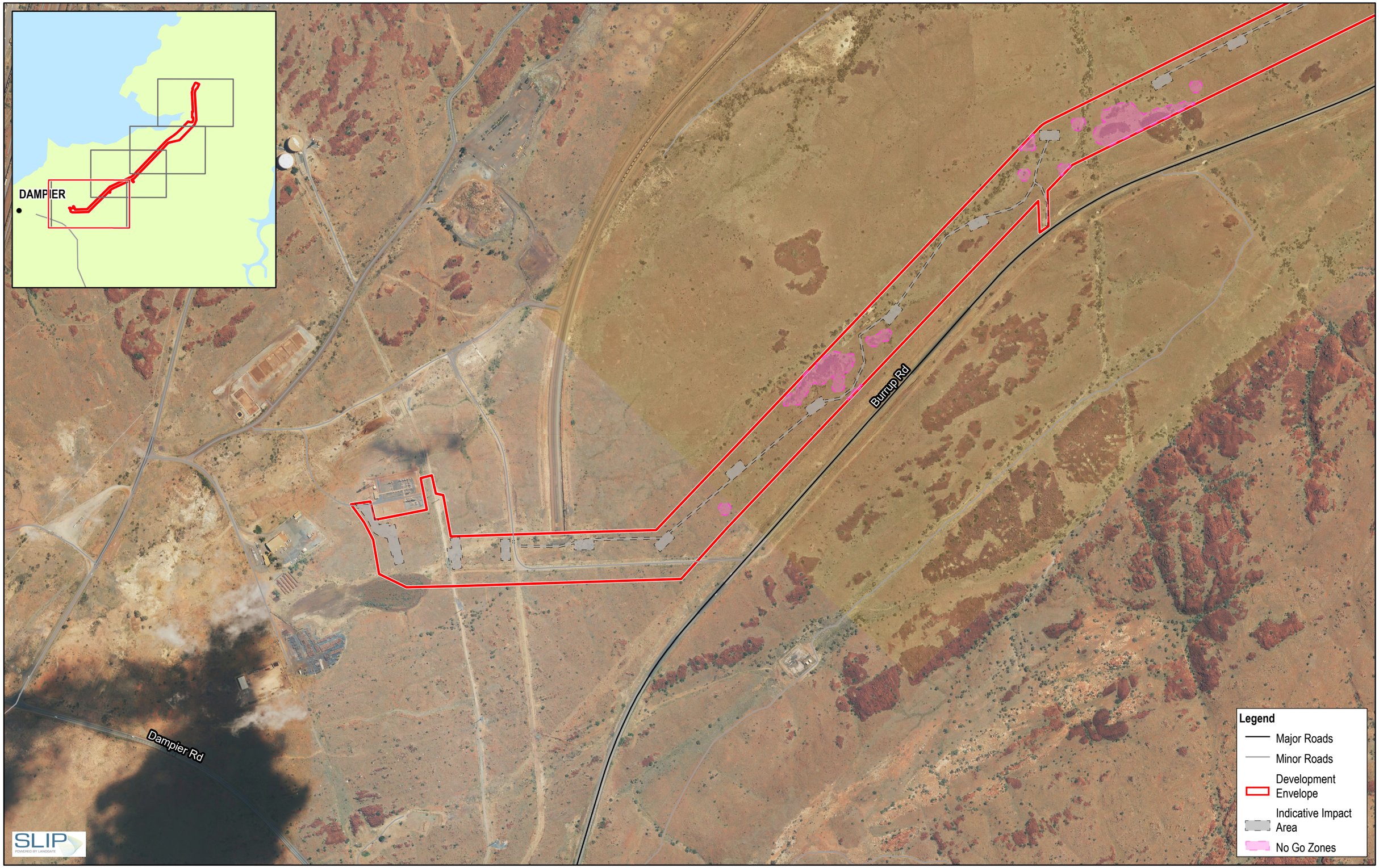
Proposal Location and Development Envelope

Project No. **12582802**
Revision No. **0**
Date **07/11/2022**

FIGURE 2-1

G:\61\12582802\GIS\Maps\Working\12582802_EPA\12582802_EPA.aprx\12582802_EPA_001_1_RevB_ProjectLocation
Print date: 07 Nov 2022 - 14:43

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



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 No-Go Zones

Project No. **12582802**
Revision No. **0**
Date **07/11/2022**

FIGURE 2-2
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G:\61\12582802\GIS\Maps\Working\12582802_EPA\12582802_EPA.aprx\12582802_EPA_001_2_RevC_Indicative_FootPrint
Print date: 07 Nov 2022 - 14:47

Data source: Landgate_Subscription_ImageryWANow;
World Topographic Map: Esri Community Maps Contributors, Geoscape, Esri, HERE, Garmin, Foursquare, METI/NASA, USGS
World Hillshade: Esri, Geoscience Australia, NASA, NGA, USGS. Created by: rbrown3

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 No-Go Zones

Project No. **12582802**
Revision No. **0**
Date **07/11/2022**

FIGURE 2-2
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G:\61\12582802\GIS\Maps\Working\12582802_EPA\12582802_EPA.aprx\12582802_EPA_001_2_RevC_Indicative_FootPrint
Print date: 07 Nov 2022 - 14:48

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World Topographic Map: Esri Community Maps Contributors, Geoscape, Esri, HERE, Garmin, Foursquare, METI/NASA, USGS
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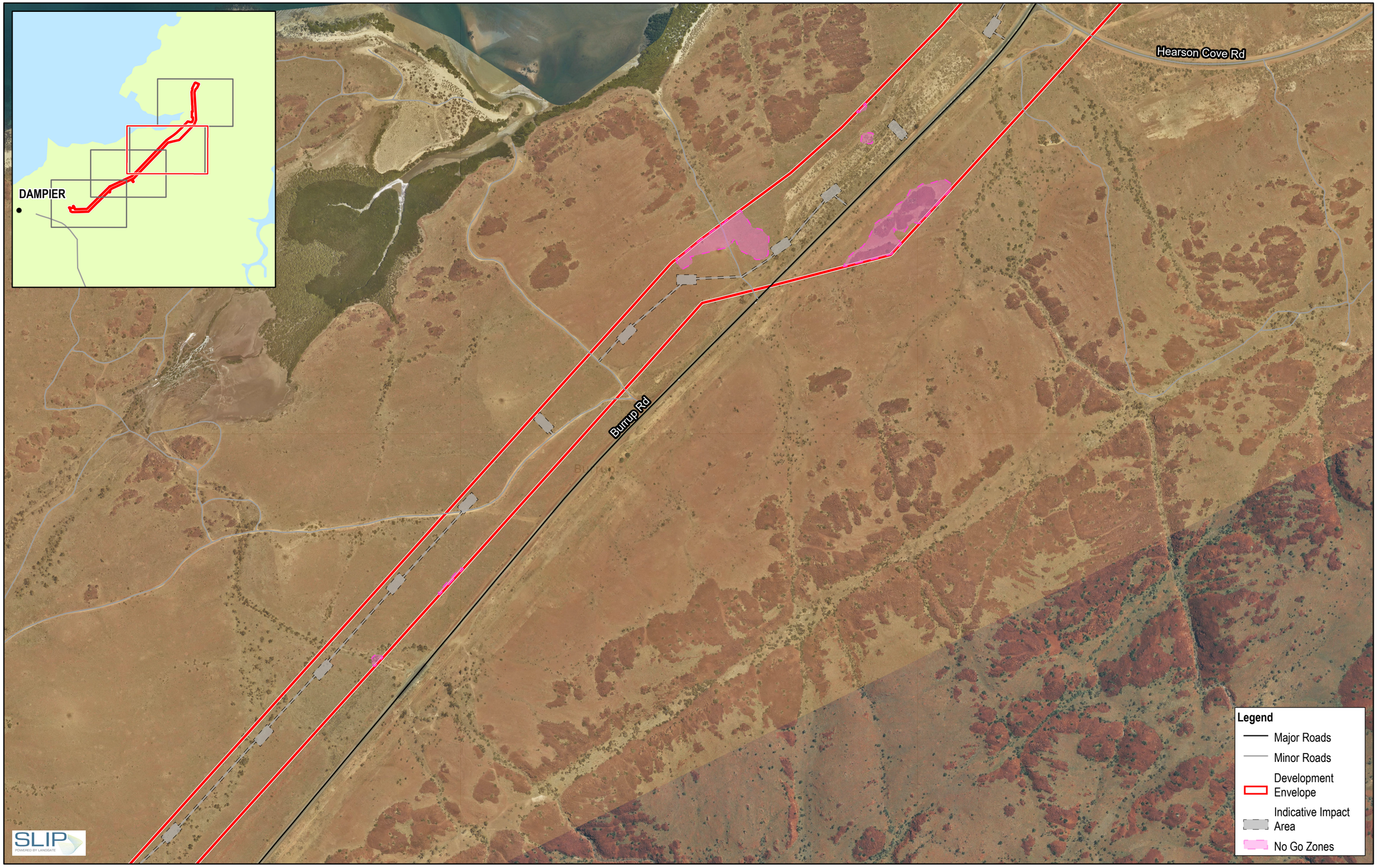

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Horizon Power
Burrup Expansion Program

Indicative Proposal Disturbance Footprint and No-Go Zones

Project No. **12582802**
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Date **07/11/2022**

FIGURE 2-2
Page 3 of 4

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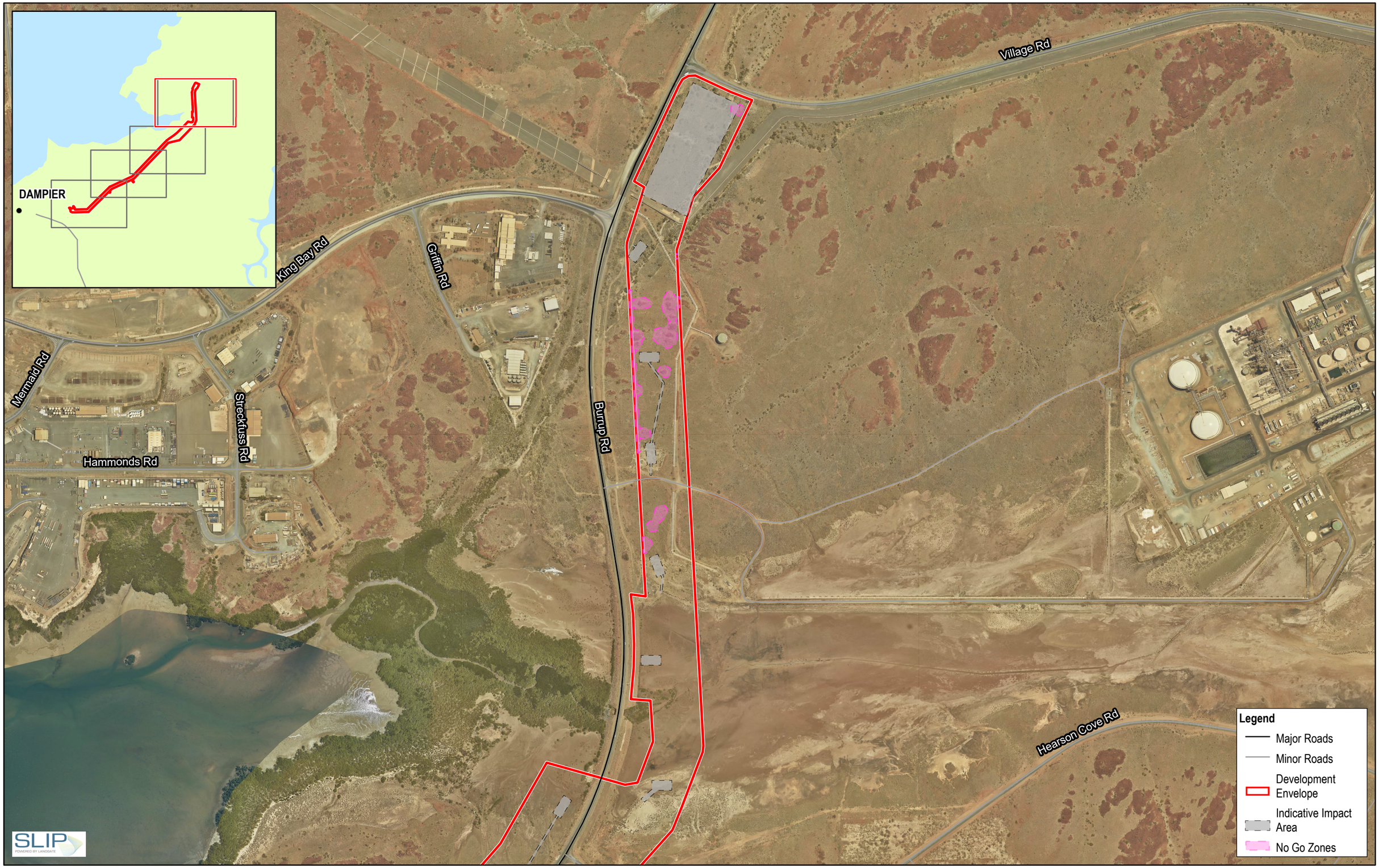

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2.2 Background and justification

Horizon Power is a State Government owned energy utility, responsible for power generation, retail supply and network electrical infrastructure in the NWIS which services areas in the Pilbara.

The Burrup SIA is home to key industries which significantly contribute to the State and National economies. In line with Australia's and individual proponents' commitment to net zero emissions by 2050, industrial tenants located in the Burrup SIA are seeking to reduce their carbon emissions through a variety of means, underpinned by increased access to renewable energy. To meet emission targets, it is necessary to develop solutions that enable renewable energy to be delivered to the Burrup SIA, supporting tenants to meet their existing and future electricity demand.

The Burrup Peninsula is an area of significant Aboriginal cultural heritage value, which is constrained in its ability to host large-scale renewable energy generation. The Burrup Peninsula is recognised for its unique natural and Aboriginal cultural heritage, consisting of a diverse array of rock art (potentially numbering in the millions) and stone arrangements, which are important within the Aboriginal traditions of Ngarda-Ngarli people.

Key facilities on the Burrup have their own islanded power generation facilities and maintain their own spinning reserve and redundancy requirements (note: the PNAC now governing the NWIS was, in part, established to help drive efficiencies in operation for things like spinning reserve and redundancy).

The transition of power users from thermal to renewable energy is expected to take place over the next 20 years. Based on the limited land available and the high environmental and heritage value of the Burrup Peninsula, the establishment of common user transmission infrastructure that connects the area to offsite renewable resources, will be required.

The Proposal will provide common user transmission infrastructure, owned and operated by Horizon Power. This provides 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 support the transition towards State and Federal Government emission reduction targets.

The Proposal will:

- Expand the NWIS electricity network, by constructing an overhead transmission line between the Dampier substation and the Burrup SIA
- Provide common user transmission infrastructure, owned and operated by Horizon Power
- Provide opportunities for tenants on the Burrup to access the higher efficiency generation portfolio, including proposed renewable energy resources available on the NWIS
- Provide enabling infrastructure to support the transition towards State and Federal Government emission reduction targets.

2.3 Proposal alternatives

Horizon Power has considered four options with respect to distribution and transmission infrastructure alternatives for servicing the electrical requirements of the Burrup SIA, including:

1. Base case scenario, providing existing available transfer capacity in the vicinity of 10 MW.
2. A low case scenario, providing for transfer capacity in the vicinity of 100 MW.
3. A medium case scenario, providing for transfer capacity in the vicinity of 500 MW.
4. A high case scenario, providing for transfer capacity more than 1 GW.

2.3.1 Base Case

The base case alternative considers only servicing connections through the existing 33 kV backbone distribution infrastructure currently located on the Burrup. This alternative would only be able to provide electricity transfer capacity of approximately 10 megawatts (MW) to the area. This value of transfer capacity would be unable to support the transfer of large-scale renewable energy to the area, and as such is not recommended.

2.3.2 Low Case (Recommended Option)

The low case (recommended option) considers the installation of two 132 kV transmission lines. One 132 kV transmission line from Dampier substation to the proposed Burrup substation site and the other 132 kV transmission line from Maitland SIA to Karratha terminal.

This option would provide approximately 100 MW of transfer capacity from the Maitland SIA to the NWIS and from the NWIS to the Burrup SIA and is considered a viable option for supporting the immediate transfer of large-scale renewable energy onto the NWIS and low carbon grid electricity through to the Burrup SIA, and such is recommended.

Note: This Proposal relates to the proposed 132 kV transmission line from Dampier substation to the proposed Burrup substation site which is a key part of this option.

2.3.3 Medium Case

The medium case alternative option considers the installation of a dual circuit 220 kV transmission line from the Maitland SIA to the Burrup SIA as well as the installation of two smaller 132 kV transmission lines. One 132 kV transmission line from Dampier substation to the proposed Burrup substation site and the other 132 kV transmission line from Maitland SIA to Karratha terminal.

This option would provide approximately 500 MW of transfer capacity from the Maitland SIA to the Burrup SIA, and while considered a viable option for supporting the immediate needs of the Burrup SIA this option would be unable to support an emerging hydrogen industry, and such is not recommended.

Note: The low case option is a subset of this option, in that it delivers the two 132 kV transmission lines as considered by this medium case alternative.

2.3.4 High Case

The high case alternative option considers multiple circuit >330 kV transmission lines from the Maitland SIA to the Burrup SIA as well as the installation of two smaller 132 kV transmission lines as outlined for the low and medium cases.

This option would seek to provide more than 1 GW of transfer capacity from the Maitland SIA to the Burrup SIA, and while considered a viable option for supporting the immediate needs of the Burrup SIA and the emerging hydrogen industry, this option is not recommended due to the highly speculative nature of the final transfer capacity requirement.

Note: The low case option is a subset of this option, in that it delivers the two 132 kV transmission lines as considered by this high case alternative.

2.3.5 Proposal alternatives synopsis

It is anticipated that the Maitland SIA will service a future high efficiency generation precinct and serve as a location for the aggregation of large-scale renewable energy resources for transfer to the NWIS and the Burrup SIA.

The base case option does not deliver any incremental capacity to assist in decarbonising tenant's operations in the Burrup SIA.

The low case option (recommended) will support both the medium case and high case options as well proposed renewable projects in the area. This option has minimal impact to future transmission infrastructure corridors that would be required to service either the medium case or high case options.

The medium option delivers suitable transfer capacity for the short to medium term requirements for the Burrup SIA but will constrain the development of further transmission infrastructure to the Burrup SIA due to land constraints, the transfer capacity will also quickly become inadequate should a local hydrogen industry develop in the area.

The high case option is speculative at this stage and requires further investigation before a firm voltage and transfer capacity can be nominated.

Both medium and high case options will require an additional transmission infrastructure corridor to be established between the Maitland SIA and the Burrup SIA. Development WA is currently investigating options for this infrastructure corridor as outlined in their 10 Year Industrial Land Strategy for WA. Noting that in the Strategy it rated "*Resolve land assembly and alignment for the Burrup Maitland Infrastructure corridor*" as a "*High*" priority item.

2.4 Local and regional context

2.4.1 Climate

The Proposal is located on Murujuga (Burrup Peninsula) within the Pilbara region of WA, which experiences a semi-arid climate. Temperatures are warm to hot all year and rainfall is generally low, mostly falling in the late summer months due to the influence of tropical cyclones and monsoon. The closest meteorological recording station is located in Karratha (Karratha Aero station No. 004083). Climatic data from this station indicates the mean maximum temperature ranges from 36.2 °C in March, to 26.5 °C in June/July. The mean minimum temperature ranges from 26.9 °C in January to 13.9 °C in July. The mean annual rainfall is 297.5 mm, receiving highest rainfall in February (average of 77.5 mm) (BoM 2022).

2.4.2 Geology, landform and soils

The Proposal 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).

2.4.3 Hydrology

Murujuga 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 Proposal 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.

2.4.4 Regional biogeography

The Proposal is located within the Pilbara bioregion and Roebourne subregion as described by the Interim Biogeographic Regionalisation of Australia (IBRA). The Roebourne subregion extends across the coastal areas of the Pilbara bioregion.

The Roebourne sub-region of the Pilbara bioregion comprises a range of landscapes, including extensive quaternary alluvial and Aeolian coastal floodplains on the western margin, to broad plateaux and stony ridges, separated by undulating plains of alluvial clays, sands, silts and gravels (Tille, 2006). Vegetation and the associated landscapes in the region are broadly described as:

- Coastal and sub-coastal plains and uplands with mixed bunch and *Triodia* hummock grass Savannahs, and dwarf shrub steppes containing *Acacia stellaticeps* or *A. pyrifolia* and *A. inaequilatera*;
- Ephemeral drainage lines with *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands; and
- Marine alluvial flats and river deltas, supporting *Sporobolus* and mangrove communities (Kendrick and Stanley 2001).

The Pilbara bioregion is characterised by high biodiversity and biological endemism, due to its geological diversity and location between the central desert and tropical bioclimatic regions.

2.4.5 Land use

2.4.5.1 Land Zoning

The majority of the DE is located in land zoned as Strategic Industry (85.3%). The remainder of the DE (14.7%) is zoned as District roads (GoWA 2022).

2.4.5.2 Conservation reserves and environmentally sensitive areas

There are no DBCA managed lands within the DE, however the Murujuga National Park is located within close proximity, approximately 100 m north and 180 m east of the DE.

No Environmentally Sensitive Areas (ESAs) intersect the DE.

2.4.6 Social values

The Proposal is located within the Shire of Karratha, the southern portion of the DE approximately 1.5 km east of the Dampier township.

The City of Karratha has a population of approximately 22,199 people (ABS 2021). Within the City of Karratha:

- Approximately 36.0% of the population is younger than 20 years, 57.0% of the population is aged between 20 – 60 years, and approximately 7% of the population is aged over 60 years;
- Unemployment rate is currently 6.0%. Approximately 69.4% of those working are employed full time, and a further 17.9% are employed on a part-time basis; and
- Major industries of employment are iron ore mining, oil and gas extraction, other non-metallic mining and quarrying, and primary education (ABS 2021).

2.4.7 Heritage

Murujuga and its surrounds supports extensive Aboriginal cultural heritage sites, with the Dampier Archipelago (including Burrup Peninsula) listed on the National Heritage register. Murujuga was also placed on Australia's World Heritage Tentative List in February 2020. The wider Dampier Archipelago region is known to have one of Australia's greatest collection of rock art (petroglyphs) (DEC 2013).

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). Horizon Power is committed to avoiding direct impact to known Aboriginal cultural heritage.

Currently, MAC is working in partnership with the WA Government to prepare a World Heritage nomination for the Dampier Archipelago National Heritage area, in collaboration with the Australian Government and stakeholders. The area is being nominated due to its outstanding Aboriginal cultural value, which includes over one million petroglyphs (rock art) showing human images, extinct animal species such as megafauna and Thylacines (Tasmanian tiger), as well as existing avian, marine and land animals. Although not a current constraint on the Proposal, this World heritage nomination has been considered during the design of the Proposal, with the Proposal being designed to avoid impacts to known Aboriginal cultural heritage values.

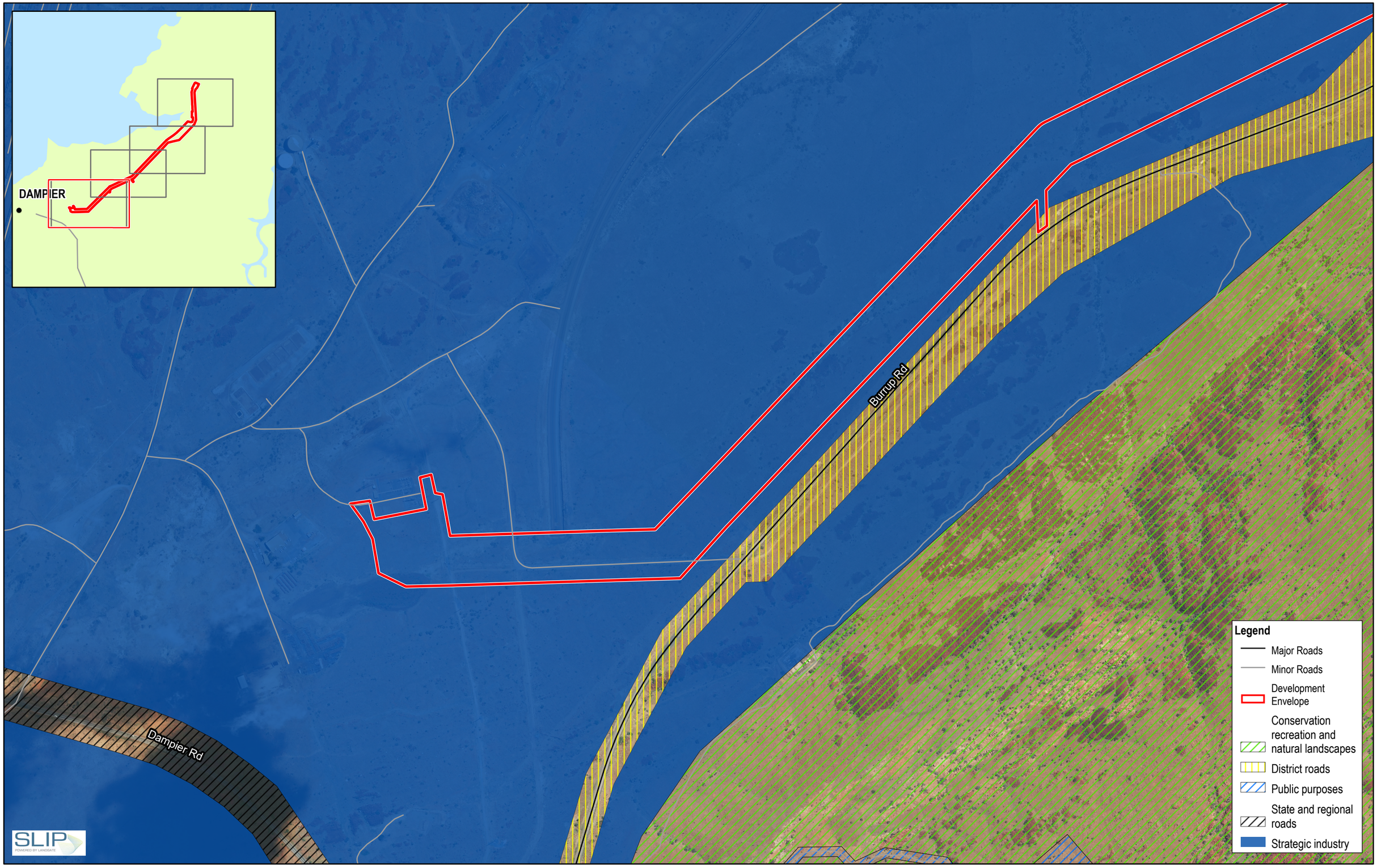
2.4.8 Other Proposals in the surrounding area

The Proposal is located within the Burrup SIA, and consequently, there are a number of other activities, developments and land use Proposals in proximity to this Proposal. Existing and proposed developments in the Burrup SIA include, but are not limited to:

- Woodside Energy Ltd – Karratha Gas Plant (operational from 1989):

    - Located approximately 2.5 km north of this Proposal;
- Yara Pilbara Fertilisers Pty Ltd – Liquid Ammonia Plant (operational from 2003):
    - Located approximately 1.6 km east of this Proposal;
- Woodside Energy Ltd – Pluto LNG Development:
    - Located approximately 0.5 km north-west of this Proposal;
    - The Pluto LNG Development was approved under the EPBC Act on 11 October 2007 (EPBC 2006/2968). The Ministerial Statement for the Proposal was granted on 24 December 2007;
- Yara Pilbara Nitrates Pty Ltd [initially referred by Burrup Nitrates Pty Ltd] – Technical Ammonium Nitrate Production Facility:
    - Located approximately 1.6 km east of this Proposal;
    - The Facility was approved under the EPBC Act on 2 October 2008 (EPBC 2008/4546). The Facility was granted a Ministerial Statement on 11 July 2011;
- North West Shelf Project Expansion:
    - Located approximately 1.4 km north of this Proposal;
    - The North West Shelf Project Expansion was referred to the EPA in November 2018 and is currently under assessment.
- Pluto North West Shelf Interconnector Pipeline:
    - Located approximately 0.5 km north-west of this Proposal;
    - The Pluto North West Shelf Interconnector Pipeline was granted a Ministerial Statement on 21 November 2019;
- Yara Pilbara Fertilisers Pty Ltd – Ammonia Plant, Murujuga (Burrup Peninsula), Renewable Hydrogen Project:
    - Located approximately 1.5 km east of this Proposal;
    - The Ammonia Plant was approved under the EPBC Act on 14 September 2020 (EPBC 2020/8739). The Ammonia Plant was referred under section (s) 38 of the EP Act on 7 August 2020 and the Ministerial Statement was granted on 4 August 2022;
- Perdaman Chemicals and Fertilisers Pty Ltd – Perdaman Urea Project:
    - Located immediately adjacent (east) of this Proposal; and
    - The Urea Project was approved under the EPBC Act on 26 February 2022 (EPBC 2018/8383). The Urea Project was referred (via third party referral) to the EPA under s38 of the EP Act on 14 November 2018 and the Ministerial Statement was granted on 24 January 2022.

In addition, there are fifteen granted Native Vegetation Clearing Permits within a 10 km of the Proposal. The above Projects and clearing permits have been used to inform the assessment of cumulative impacts of the Proposal with other developments on the Burrup SIA (refer to Section 9.1).



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Horizon Power
Burrup Expansion Program

Land Use

Project No. **12582802**
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FIGURE 2-3
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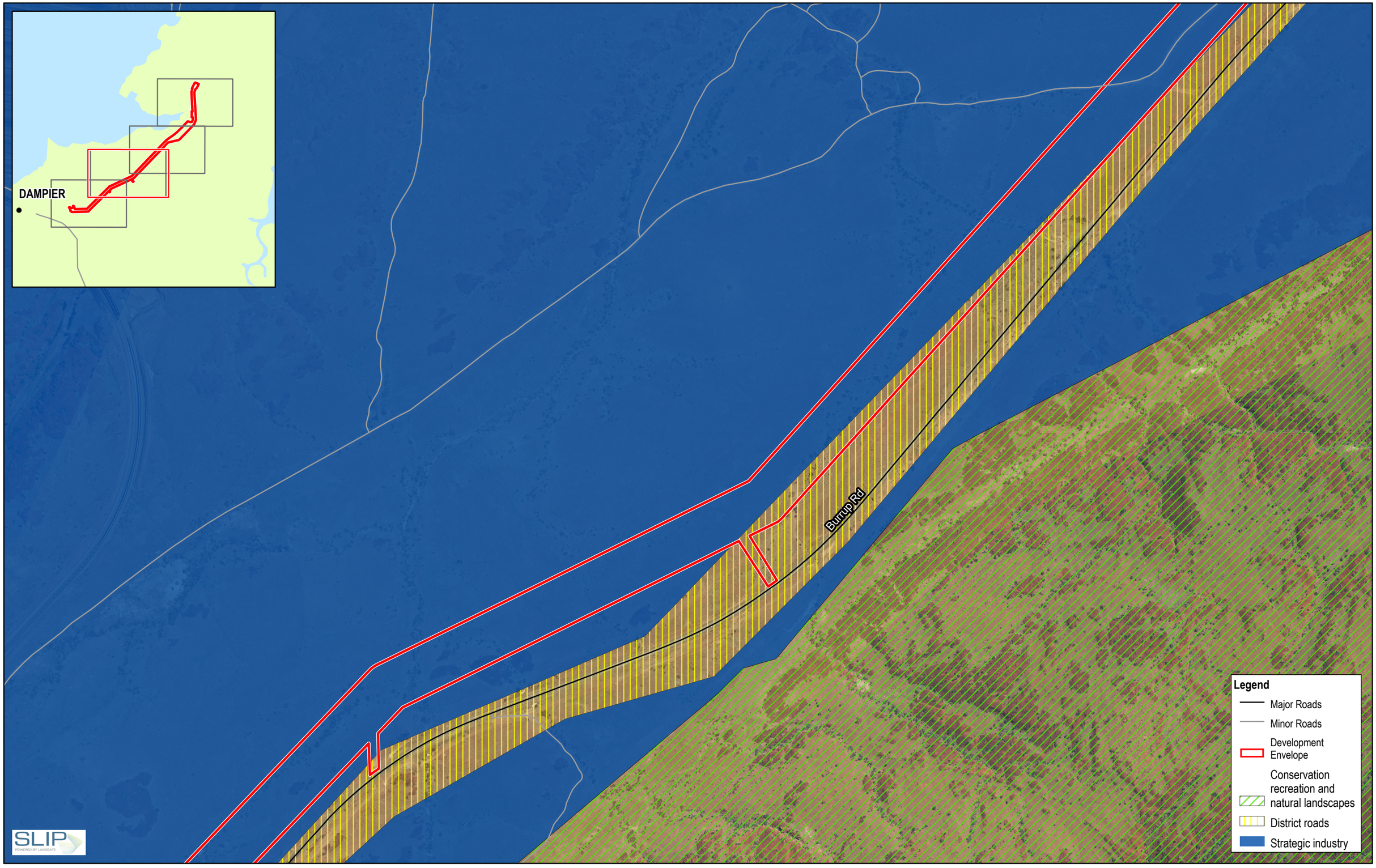

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FIGURE 2-3
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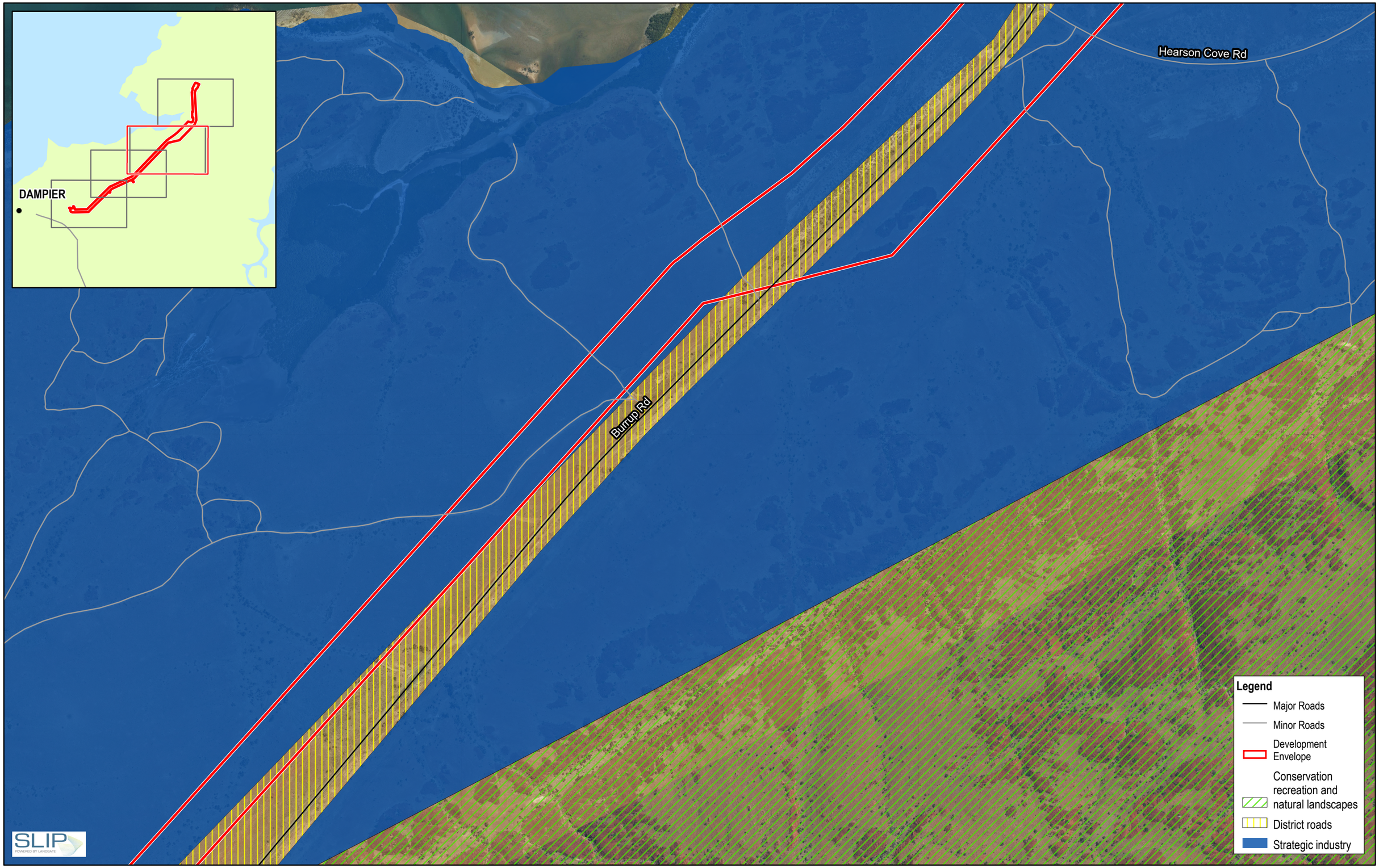

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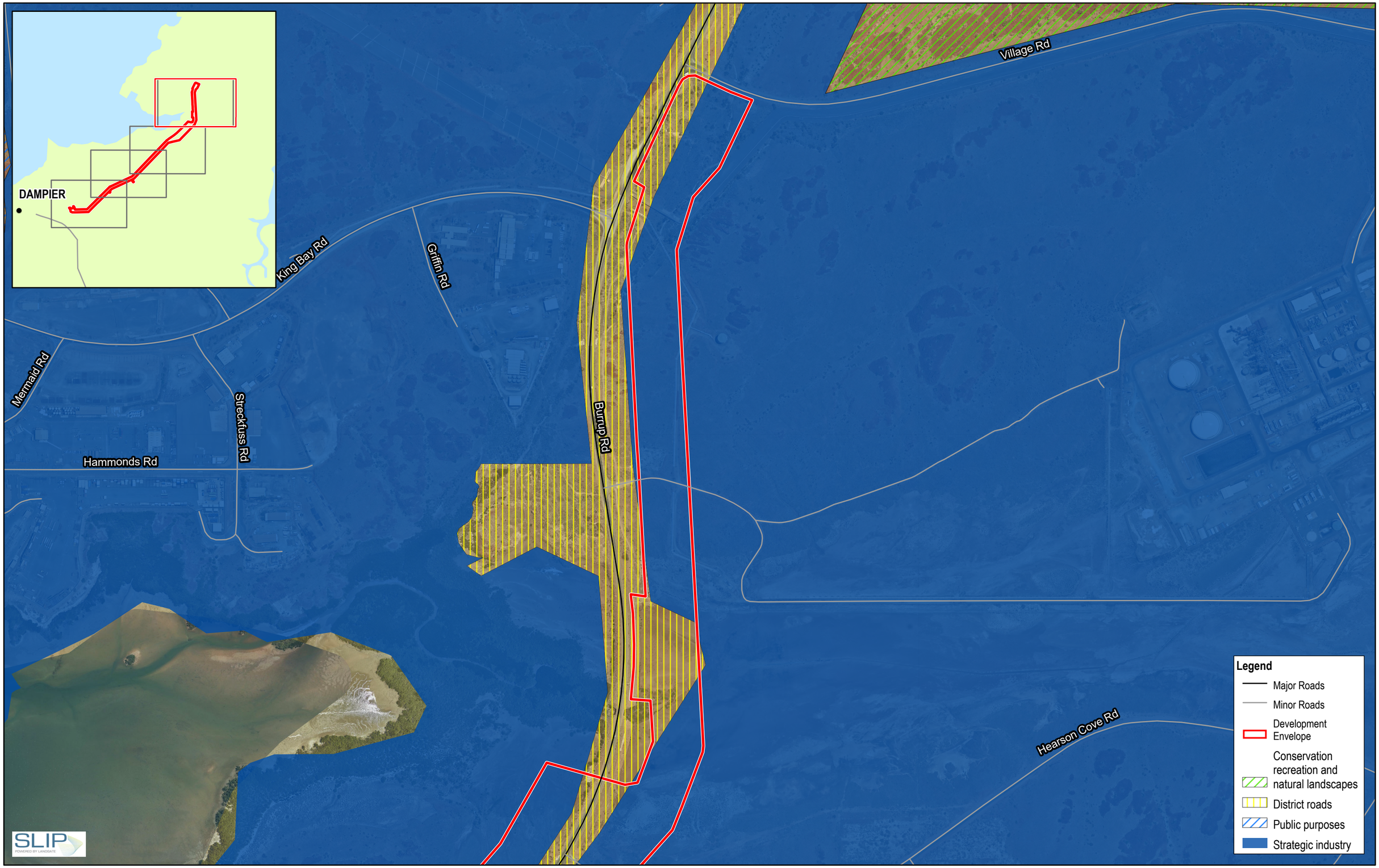

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FIGURE 2-3
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3 Legislative context

3.1 Environmental impact assessment process

3.1.1 Environmental Protection Act 1986, Part IV Environmental Impact Assessment

The Proposal is being referred to determine if assessment is required under Part IV of the EP Act. Part IV of the EP Act is the primary legislation governing environmental protection and impact assessment in WA. Division 1 of Part IV of the EP Act provides for the referral and assessment of significant or strategic Proposals.

3.1.2 Environment Protection and Biodiversity Conservation Act 1999

A proposed action that may have a significant impact on a MNES requires approval from the Commonwealth DCCEEW (formerly DAWE) under the EPBC Act. The EPBC Act provides that a 'controlled action' is one that is likely to cause a significant impact to a MNES and which must be approved under the EPBC Act. Parts 7 and 8 of the EPBC Act provides for the referral and assessment of controlled actions.

The Proposal will be referred to DCCEEW under the EPBC Act due to potential impacts the Dampier Archipelago National Heritage place and potential impacts to habitats for listed threatened species. Should the Proposal be determined a controlled action, Horizon Power would request that the EPBC Act assessment approach be an 'accredited assessment' of MNES to be undertaken as part of the EPA assessment of the Proposal. The EPA assessment will then inform a decision by the Federal Minister for Environment and conditions for the Proposal under the EPBC Act.

3.2 Other approvals and regulation

Following primary environmental approval of the Proposal under Part IV of the EP Act, additional regulatory approvals potentially required to develop and operate the Proposal are summarised in Table 3-1.

Table 3-1 Other approvals

Decision-making authority	**Legislation or Agreement regulating the activity**	**Approval required (and specify which Proposal element the approval is related to)**	**Whether and how statutory decision-making process can mitigate impacts on the environment? (Yes/No and summary of reasons. Include a separate line item for each relevant impact, and discuss how the EPA's factor objective will be met)**
Department of Planning, Lands and Heritage (DPLH)	*Aboriginal Heritage Act 1972* (AHA)	All Proposal activities must be undertaken in accordance with the AHA (WA), which are relevant to the Social Surroundings element of the Proposal. There will be no planned disturbance, damage,	Yes: The AHA is relevant to management of the risk associated with "*Direct physical disturbance of Aboriginal and municipal heritage features from construction and operational activities"* which is further described in Section 6.3. This is aligned to the EPA factor

Decision-making authority	Legislation or Agreement regulating the activity	Approval required (and specify which Proposal element the approval is related to)	Whether and how statutory decision-making process can mitigate impacts on the environment? (Yes/No and summary of reasons. Include a separate line item for each relevant impact, and discuss how the EPA's factor objective will be met)
		impact or removal of any Aboriginal Heritage sites as part of Proposal activities. However, if this did become necessary it would only be done if it could be performed in accordance with the AHA and any other applicable legislation.	objectives for Social Surroundings.
Department of Biodiversity Conservation and Attractions (DBCA)	*Biodiversity Conservation Act 2016* (BC Act)	Authorisation to Take or Disturb Threatened Fauna	Yes: Any conditions attached to the approved Authorisations will be adhered to during clearing and disturbance works

3.2.1 Land tenure

The current tenure of the DE is provided in Appendix 2.

As an 'energy operator', Horizon Power has certain rights under sections 46 and 49 of the *Energy Operators (Powers) Act 1979* (EOPA) which allow Horizon Power to access and use land for the purpose of constructing, maintaining and operating electricity infrastructure. Horizon Power will utilise these powers for the overhead component of the works.

3.2.2 Decision-making authorities

The authorities listed in Table 3-2 have been identified as decision-making authorities (DMAs) for the Proposal.

Table 3-2 Decision-making authorities

Decision-making authority	Relevant legislation
Minister for Aboriginal Affairs	AHA
Minister for the Environment	BC Act, EP Act

4 Stakeholder engagement

4.1 Key stakeholders

The key stakeholders identified for the Proposal are provided in Table 4-1.

Table 4-1 Key project stakeholders

Category	Stakeholders
Agencies acting on behalf of the Commonwealth Government	• Department of Climate Change, Energy, the Environment and Water (DCCEEW).
State Government – Departmental Ministers	• Department of Premier and Cabinet (DPC); and • Department of Planning Land Heritage on behalf of the DBNGP Land Access Minister.
State Government - Agencies	• Department of Planning, Lands and Heritage (DPLH); • Main Roads Western Australia (MRWA); • Water Corporation; • Department of Jobs, Tourism, Science, and Innovation (JTSI); and • Development WA (DevWA).
Local Government	• City of Karratha
Traditional owners	• Murujuga Aboriginal Corporation (MAC); and • Ngarluma Aboriginal Corporation (NAC).
Corporate	• Woodside; • Rio Tinto (covers Hamersley Iron); • BHP Minerals; • Yara Australia (Yara); • Epic Energy (Pilbara Pipeline); and • Australia Gas Infrastructure Group Dampier Bunbury Pipeline.

4.2 Stakeholder engagement process

Horizon Power will conduct planned and regular meetings with stakeholders as required to ensure that information is shared and transferred effectively and appropriately.

4.3 Stakeholder consultation outcomes

The outcomes of the stakeholder consultation undertaken to date for the Proposal is provided in Table 4-2.

Table 4-2 Stakeholder consultation register

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. Two Aboriginal Heritage surveys and Heritage monitoring during geotechnical investigation works.	Provision of 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. Two Aboriginal Heritage surveys and Heritage monitoring during geotechnical investigation works.	Provision of archaeological and ethnographical Aboriginal Heritage reports including recommendations for Horizon Power on how to progress works.

Stakeholder	Date	Type of consultation	Stakeholder comments/issue/topic raised	Stakeholder response
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. Focus discussions on preferred routes, land tenure and land access items. Focus 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 projected, Geotech and Native Vegetation Clearing Permit (NVCP). Focus 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. Formal responses in relation to Woodside's requested changes to the Pilbara Network Rules– noting Woodside's requested changes to the Pilbara Network Rules are proposed by Woodside to support its connection to the NWIS and more broadly connection to the infrastructure presented in this Proposal.
Yara	April 2021 - present	General Letter	Introduction and updates related to the proposed common user	General in principle support for common user transmission

Stakeholder	Date	Type of consultation	Stakeholder comments/issue/topic raised	Stakeholder response
		Meetings MS Teams meetings Email	infrastructure transmission from Burrup to Maitland, including overviews of high, low and medium case transmission options.	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	General in principle support for common user transmission infrastructure being provided to the Burrup SIA subject to infrastructure considering future developments.

Stakeholder	Date	Type of consultation	Stakeholder comments/issue/topic raised	Stakeholder response
			being performed by GHD for Development WA.	
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. Focus 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	Focus 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.
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	Introduction and updates to the proposed common user infrastructure transmission from Burrup to Maitland.	General in principle support for common user transmission infrastructure being provided to the

Stakeholder	Date	Type of consultation	Stakeholder comments/issue/topic raised	Stakeholder response
		Emails Sharing of concept design information Workshops	Focus discussions on technical matters.	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	August 2022	MS Teams meeting	Pre-Referral Meeting Dampier to Burrup 132 kV Line.	Supportive of Horizon Power approach to submitting referral.

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.

5 Object and principles of the EP Act

Section 4A of the EP Act establishes the objectives and principles of the Act in accordance with the EPA's Statement of Environmental Principles, Factors and Objectives (EPA 2021e). This section describes how each of the five principles of the EP Act have been applied to the Proposal (Table 5-1).

Table 5-1 Object and principles of the EP Act

Principle	Consideration
1. The precautionary principle Where there are threats of serious irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation. In the application of the precautionary principle, decisions should be guided by: • careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and • an assessment of the risk-weighted consequences of various options.	Horizon Power has used existing environmental data and commissioned field studies within and adjacent to the DE to assess the environmental values and potential impacts of the Proposal, including: • Flora and vegetation; • Terrestrial fauna; and • Aboriginal and European heritage. Potential impacts have been identified and described under each preliminary key environmental factor. Information gathered during baseline studies has informed the environmental impact assessment and has reduced uncertainty surrounding predicted impacts. Horizon Power has consulted with key stakeholders (in particular the traditional owners) early in the Proposal design to select a location, and develop a design and footprint with the smallest environmental impact. Ongoing consultation with key stakeholders is planned as the Proposal enters the detailed design phase. Horizon Power has planned and designed the Proposal to avoid, where possible, serious or irreversible damage to the environment. The design characteristics take engineering, environmental and social investigations and stakeholder consultation into account. This will continue to be considered as the detail design develops. Horizon Power has applied the EPA's mitigation hierarchy when developing mitigation measures for the Proposal. As far as practicable, Horizon Power intends to avoid direct impact to significant environmental and Aboriginal cultural heritage values within the DE, by delineating 'no go zones' where disturbance is prohibited without approval by Horizon Power's Manager of Sustainability. Clearing of native vegetation will be minimised where possible, and cleared areas rehabilitated following construction unless required for ongoing operation and maintenance of the Proposal.

Principle	Consideration
2. The principle of intergenerational equity The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.	The Proposal will preserve the health, diversity and productivity of the environment by minimising disturbance of remnant native vegetation and fauna habitat through use of existing disturbed areas, flexible Proposal design and alternative (lower impact) construction methods. The development of common user transmission infrastructure between the existing Dampier substation and the proposed new substation on the Burrup, will provide opportunities for tenants on the Burrup to access the higher efficiency generation portfolio, including proposed renewable energy resources available on the NWIS.
3. The principle of the conservation of biological diversity and ecological integrity Conservation of biological diversity and ecological integration should be a fundamental consideration.	Baseline studies have identified and confirmed the range and condition of the environment within and surrounding the Proposal. There are patches of native vegetation within the DE which are more biologically diverse and have high ecological integrity (i.e. Priority Ecological Community 'Burrup Peninsula rock pile communities' (listed Priority 1 PEC)). To ensure the Proposal avoids impacts to Burrup Peninsula rock pile communities PEC, 'no-go zones' have been developed within the DE. Construction of the Proposal will avoid these no-go zones, unless construction of the Proposal is constrained by Aboriginal cultural heritage. In the unlikely event that construction of the Proposal is constrained by Aboriginal cultural heritage within the northern quarter of the DE (i.e. an unexpected find during initial ground disturbing works), minor impacts to the Burrup Peninsula rock pile communities PEC may be required. Horizon Power has sought to preserve remnant biodiversity where possible by minimising clearing of native vegetation through use of existing disturbed areas, flexible Proposal design and alternative (lower impact). construction methods.

Principle	Consideration
4. Principles relating to improved valuation, pricing, and incentive mechanisms Environmental factors should be included in the valuation of assets and services. The polluter pays principle – those who generate pollution and waste should bear the cost of containment, avoidance or abatement. The users of goods and services should pay prices based on the full life cycle costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste. Environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms, which benefit and/or minimise costs to develop their own solutions and responses to environmental problems.	Horizon Power acknowledges the need for improved valuation, pricing and incentive mechanisms and endeavours to pursue these principles when appropriate. For example, environmental factors have been considered in the planning and design of the Proposal, and there has been (and will continue to be) a strong focus on avoiding significant environmental and heritage values, and minimising clearing of native vegetation. Impacts on flora, vegetation, terrestrial fauna and social surrounds have been assessed and mitigation measures proposed giving regard to the EPA's mitigation hierarchy. Horizon Power accepts that the cost of the Proposal must include measures to mitigate environmental impacts (including alternative construction methods such as helicopter stringing, and rehabilitation of temporary disturbance areas). These requirements will be incorporated into the overall Proposal costs.
5. The principle of waste minimisation All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.	Management strategies will be implemented to ensure the generation of waste during the construction phase is minimised. All construction and maintenance activities will be carried out with a focus on waste minimisation.
Description of how the object of the EP Act has been considered The object of the EP Act is to protect the environment of the State, having regard to the EP Act principles. The Proposal's predicted outcomes have been considered in relation to the environmental principles and the EPA's environmental objectives for each key environmental factor. Mitigation of environmental impacts from this Proposal have been assessed through a hierarchy of avoid, minimise, rehabilitate and offset environmental impacts. This hierarchy is achieved primarily through changes in Proposal design to avoid and minimise impacts; development and implementation of management measures for construction and operation. Horizon Power considers the measures undertaken to reduce the Proposal's environmental and social impacts, will ensure that the object of the EP Act has been considered satisfactorily.	

6 Environmental factors and objectives

Environmental factors are those parts of the environment that may be impacted by a Proposal (EPA 2021e). The EPA has 14 environmental factors, organised into five themes (Sea, Land, Water, Air and People) as detailed in Table 6-1, which allow for a systematic approach to organising environmental information for the purpose of impact assessment. Each of the 14 environmental factors has an associated objective which is used to determine whether the potential environmental impacts of a Proposal or scheme may be significant. The EPA environmental factors and objectives, and their relevance to the proposed changes, are summarised in Table 6-1.

Table 6-1 WA EPA Environmental Factors and their relevance to the Proposal

Theme	Factor	Objective	Relevance to Proposal	Addressed in Referral	Key Environmental Factor?
Sea	Benthic Communities and Habitats	To protect benthic communities and habitats so that biological diversity and ecological integrity are maintained.	The Proposal will not impact benthic communities and habitats.	No	No
	Coastal Processes	To maintain the geophysical processes that shape coastal morphology so that the environmental values of the coast are protected.	The Proposal traverses a 0.5 km portion of the tidal inlet between Hearson Cove and King Bay.	Yes	No
	Marine Environmental Quality	To maintain the quality of water, sediment and biota so that environmental values are protected.		Yes	No
	Marine Fauna	To protect marine fauna so that biological diversity and ecological integrity are maintained.	The Proposal will not impact upon Marine Fauna.	No	No
Land	Flora and Vegetation	To protect flora and vegetation so that biological diversity and ecological integrity are maintained.	The Proposal will require the clearing of native vegetation.	Yes	Yes
	Landforms	To maintain the variety and integrity of significant physical landforms so that environmental values are protected.	Distinctive, unique or important landforms are not present.	No	No
	Subterranean Fauna	To protect subterranean fauna so that biological diversity and ecological integrity are maintained.	No conservation significant subterranean fauna identified within the DE.	No	No
	Terrestrial Environmental Quality	To maintain the quality of land and soils so that environmental values are protected.	Presence and potential disturbance of Acid Sulfate Soils (ASS).	Yes	No
	Terrestrial Fauna	To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.	Proposal will impact on habitat for significant fauna.	Yes	Yes

Theme	Factor	Objective	Relevance to Proposal	Addressed in Referral	Key Environmental Factor?
Water	Inland Waters	To maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected.	Presence of drainage lines and associated vegetation.	Yes	No
Air	Air Quality	To maintain air quality and minimise emissions so that environmental values are protected.	Air quality impacts (i.e. dust) will be transient and of a short duration (only during clearing and construction).	Yes	No
	Greenhouse Gas (GHG) Emissions	To reduce net greenhouse gas emissions in order to minimise the risk of environmental harm associated with climate change	Scope 1 GHG emissions associated with the Proposal construction are expected to be well below the 100,000 tonnes CO_2-equivalent per annum threshold defined in the Environmental Factor Guideline (EPA 2020a)	Yes	No
People	Social Surroundings	To protect social surroundings from significant harm.	Aboriginal cultural heritage is known to occur within the DE. Whilst the Proposal will avoid direct impact to known Aboriginal cultural heritage, indirect impacts are possible. Portions of the Proposal DE intersect 'Dampier Archipelago (including Burrup Peninsula)' National Heritage Place which is also a municipal heritage listing. The Proposal will have a permanent impact on visual amenity of the DE and surrounds, as well as temporary impacts on amenity during clearing and construction (i.e. dust, noise and vibrations).	Yes	Yes
	Human Health	To protect human health from significant harm.	No human health impacts expected. No radiation emissions will result from the Proposal.	No	No

6.1 Environmental Factor - Flora and Vegetation

The EPA's objective for flora and vegetation is '*To protect flora and vegetation so that biological diversity and ecological integrity are maintained*' (EPA 2016d).

6.1.1 Relevant policy and guidance

Table 6-2 below provides consideration of how the relevant EPA policy and guidance, and additional State and Commonwealth guidance, have been applied to the assessment of impacts to flora and vegetation.

Table 6-2 Policy and guidance for environmental factor flora and vegetation

Relevant policy and guidance	**Explain how the EPA policy and guidance has been considered**
Environmental Factor Guideline Flora and Vegetation (EPA 2016a)	The Proposal considers the mitigation hierarchy; direct and indirect impacts; implications of cumulative impacts; predicted residual impacts; feasibility of management approaches.
Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016b)	Surveys and assessments for the Proposal have been undertaken to a standard consistent with the guidance.
Environmental Guidance for Planning and Development, Guidance Statement No. 33 (EPA 2008)	Naturally vegetated areas have been protected as much as practicable as the Proposal design has been developed.
Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (Clearing Regulations)	Native vegetation clearing to be approved under Part IV EP Act, rather than being exempt under the Regulations.
Priority Ecological Communities for Western Australia Version 28 (DBCA 2019a)	Surveys and assessments for the Proposal have identified Priority Ecological Communities consistent with the definitions.
Conservation codes for Western Australia Flora and Fauna (DBCA 2019b)	Surveys and assessments for the Proposal have identified significant flora and fauna consistent with the WA conservation codes.

6.1.2 Receiving environment

6.1.2.1 Surveys and studies

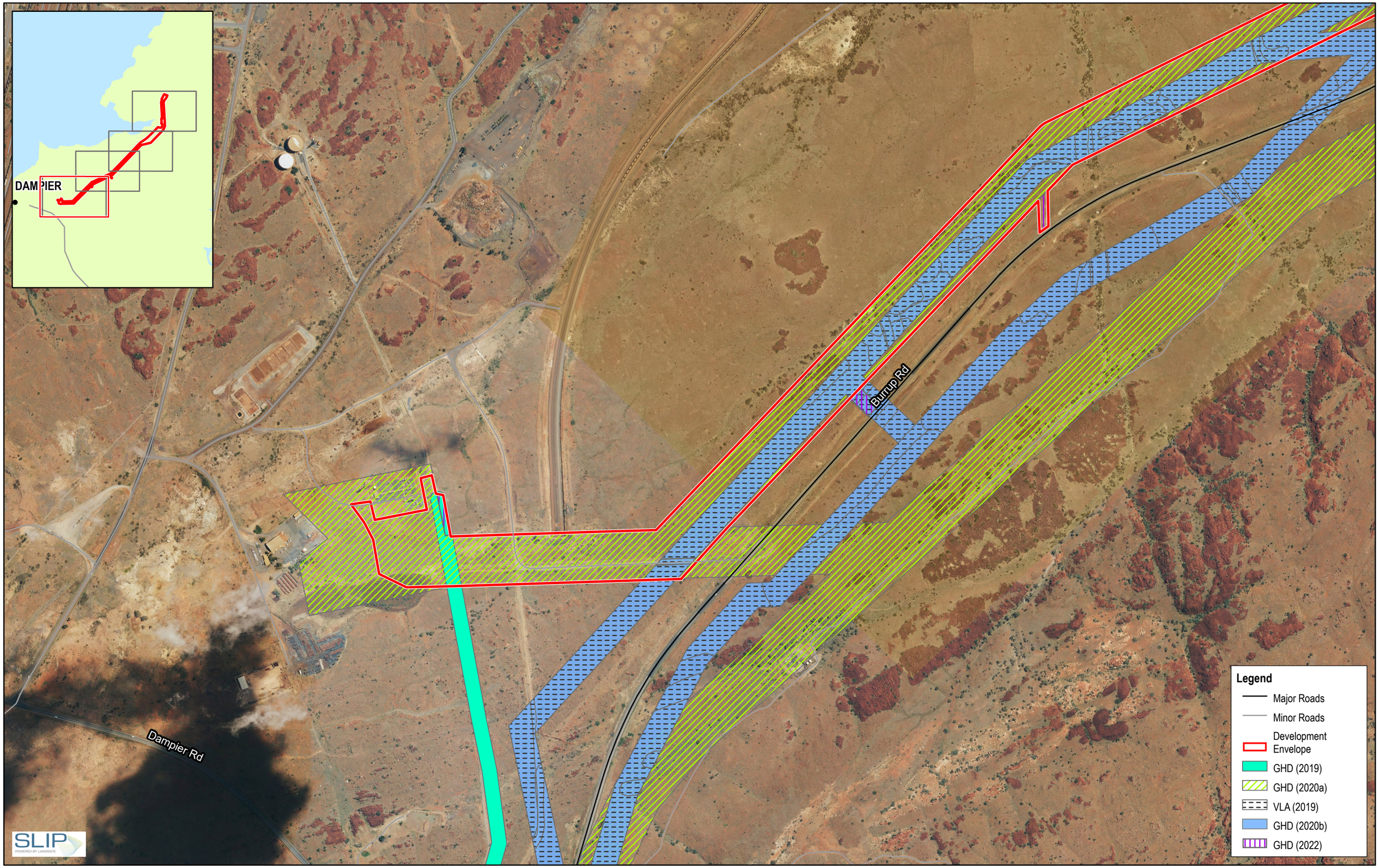
Horizon Power commissioned several studies to gain an understanding of the flora and vegetation values within and surrounding the DE. These have included reconnaissance, and detailed and targeted vegetation and flora surveys undertaken in accordance with relevant EPA guidance.

Vegetation and flora surveys of the DE (or portions of the DE) are outlined in Table 6-3 with the extent of survey coverage shown on Figure 6-1. Where survey coverage overlaps, the more recent survey supersedes the results of previous surveys.

Table 6-3 Summary of flora and vegetation surveys conducted within and surrounding the Proposal

Survey/Report	Details
Woodside Power Project Flora and Vegetation Surveys Desktop Assessment Report (VLA 2019) (Appendix 3)	Scope: Flora and vegetation survey, including a desktop assessment and field survey, broken into two sections (a southern section and a northern section). The northern section of the survey is relevant to the Proposal. Survey of both sections was undertaken in accordance with *EPA Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a). The northern section survey mapped the vegetation communities and condition, and recorded the presence of Priority flora. This section of the survey included traversing the survey area on foot and sampling included 47 relevés. The southern section mapped only vegetation types, due to the survey being undertaken in dry conditions and species within the Roebourne plains grassland were unlikely to be identified. This section of the survey included traversing the survey area on foot and sampling included 36 inspection sites. Survey dates: Northern section: 3 – 5 June 2019 and southern section: 22 – 23 July 2019. Survey area: The VLA (2019) survey area covered 1,545.20 ha and included 39.70 ha of the DE.
Horizon Power 124-KRT-DMP 132kV Line Upgrade Project Flora and Fauna Survey (GHD 2019) (Appendix 4)	Scope: Detailed flora and vegetation field survey, including a desktop assessment and field survey to identify and describe the broad dominant vegetation types, assess vegetation condition, and record vascular flora taxa present at the time of survey. The assessment was completed in accordance with *EPA Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a). The survey included traversing the survey area on foot and sampling included 15 non-permanent quadrats. Survey Dates: 10 – 14 June 2019. Survey area: The GHD (2019) survey area covered 210.90 ha and included 0.50 ha of the DE.

Survey/Report	Details
Horizon Power Burrup Expansion Project Flora and Vegetation Survey (GHD 2020a) (Appendix 5)	Scope: Level 1 flora and vegetation survey, including a desktop assessment and field survey to map vegetation communities and condition, and undertaken targeted searches for Threatened and Priority (P) flora species. The assessment was completed in accordance with *EPA Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a) between 23 – 28 April 2020. The survey included traversing the survey area on foot and sampling included 23 non-permanent quadrats and 19 relevés. Survey Dates: 23 – 28 April 2020. Survey area: The GHD (2020a) survey area covered 805.90 ha and included 71.20 ha of the DE.
Additional Areas Reconnaissance/Basic Survey (GHD 2022) (Appendix 6)	Scope: Reconnaissance survey of the remaining areas within the DE that have not yet been surveyed, including a field survey to verify that the dominant vegetation units, vegetation condition and associated fauna habitats of the additional survey areas are consistent with the results of adjacent recent surveys (GHD 2020a, b). The survey methods involved traversing the additional survey areas on foot and making opportunistic recordings and photographic reference points within identified vegetation units. The survey methodology employed by GHD was undertaken with reference to the EPA *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a) and the EPA Te*chnical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020). Survey Dates: 3 – 4 August 2022. Survey area: The GHD (2022) survey area covered 46.80 ha and covered 14.51 ha of the DE.



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Burrup Expansion Program

Biological Survey Extent

Project No. **12582802**
Revision No. **0**
Date **07/11/2022**

FIGURE 6-1
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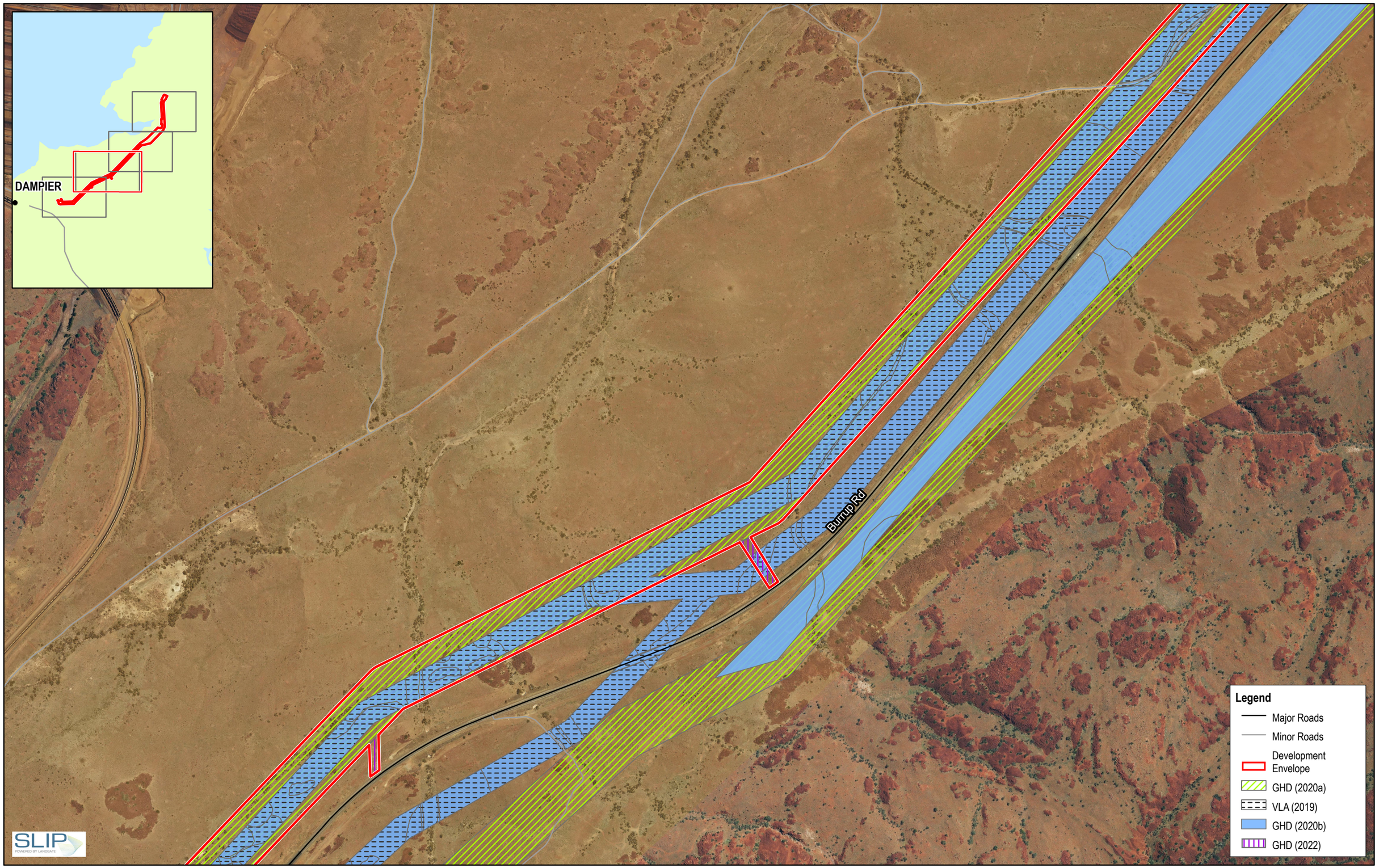

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FIGURE 6-1
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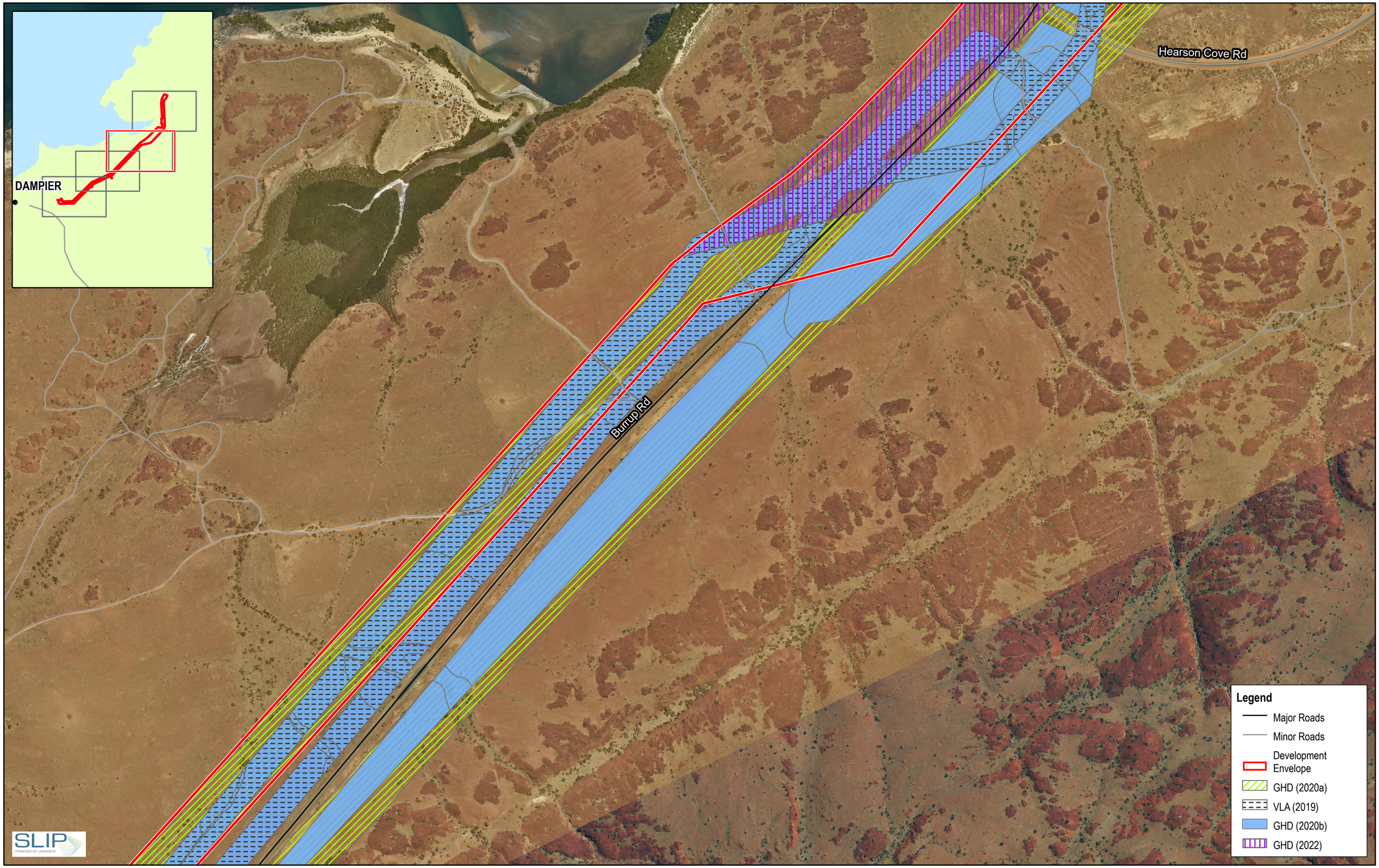

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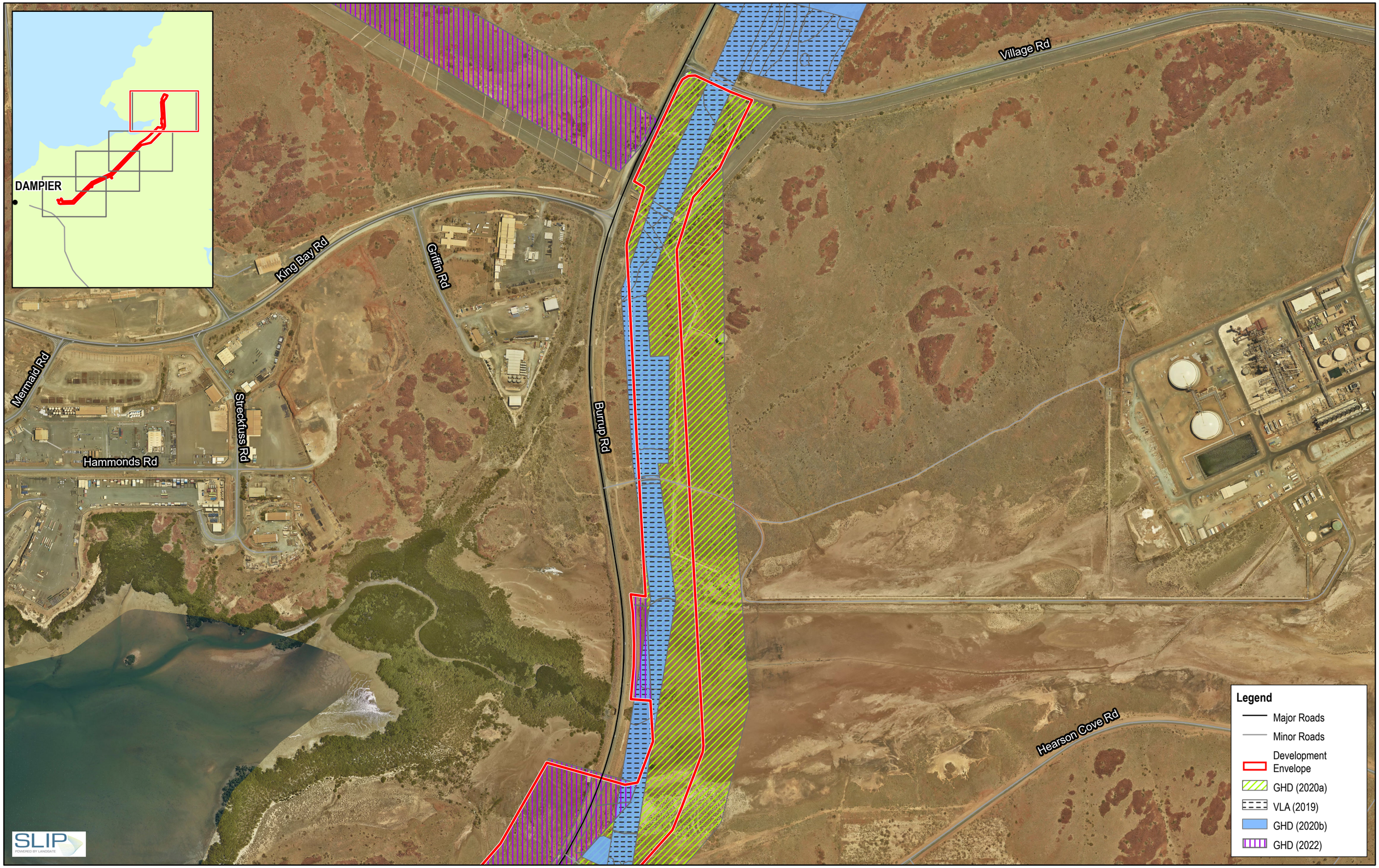

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FIGURE 6-1
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6.1.2.2 Regional biogeography

The Proposal is located within the Pilbara bioregion and Roebourne subregion as described by the Interim Biogeographic Regionalisation of Australia (IBRA). The Roebourne sub-region is characterised by Quaternary alluvial and older colluvial coastal and subcoastal plains with a grass savannah of mixed bunch and hummock grasses, and dwarf shrub steppe *of Acacia stellaticeps* or *A. pyrifolia* and *A. inaequilatera*. Uplands are dominated by *Triodia* hummock grasslands. Ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* woodlands. Samphire, Sporobolus and mangal occur on marine alluvial flats and river deltas. Resistant linear ranges of basalts occur across the coastal plains, with minor exposures of granite. Islands are either Quaternary sand accumulations, or composed of basalt or limestone, or combinations of any of these three (Kendrick and Stanley 2001).

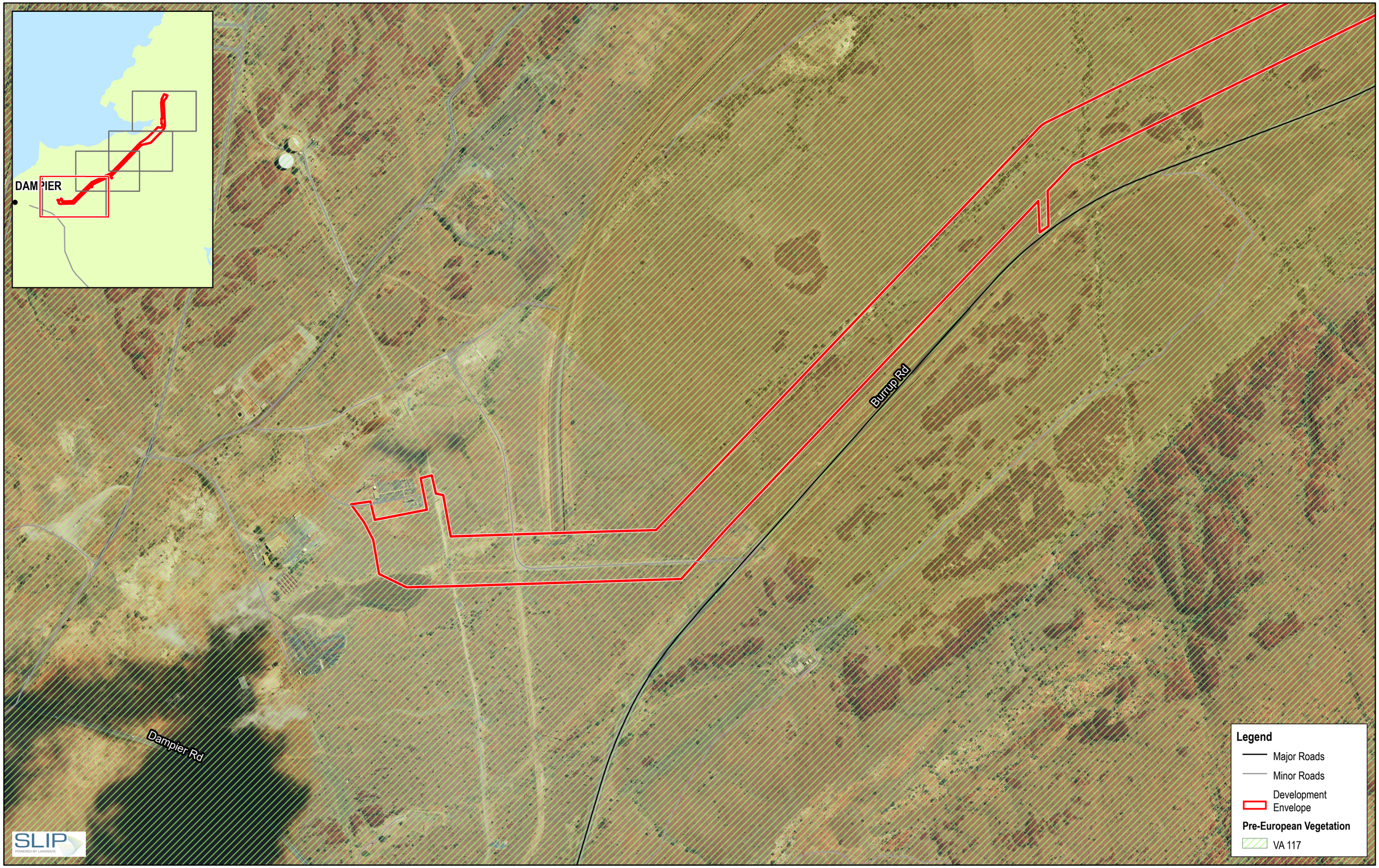
Broadscale (1:250,000) pre-European vegetation mapping (Beard, 1979) indicates that the DE intersects one Vegetation Association (VA 117) (Table 6-4 and Figure 6-2). VA 117 is well retained above the Commonwealth and State Government targets of 30% of pre-European extent, which reflects the limited agricultural and urban development of the Pilbara Bioregion.

Regional vegetation is also interpreted in terms of land systems, which define the topographic, soil and drainage characteristics that influence vegetation communities. The Pilbara region has been surveyed for the purposes of land classification, mapping and resource evaluation. One hundred and two land systems which are grouped into 20 broad land types have been described for the region, which are distinguished on the basis of topography, geology, soils and vegetation (van Vreeswyk et al. 2004). The DE intersects two land systems (Granitic and Littoral) (Table 6-4 and Figure 6-3).

Table 6-4 Vegetation Associations and land systems within the DE

Vegetation Association/land system	Description	Pre-European extent (ha)	Current extent (ha)	% Remaining
Vegetation Association 117	Hummock grasslands, grass steppe; soft spinifex.	919,517.05	886,005.79	96.36
Granitic land system	Rugged granitic hills supporting shrubby hard and soft spinifex grasslands. Geology: Archaean and Proterozoic granite, gneiss, granodiorite and porphyry. Geomorphology: 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.	408,456.36	407,221.69	99.70
Littoral land system	Bare coastal mudflats with mangroves on seaward fringes, samphire flats, sandy islands, coastal dunes and beaches.	393,122.85	355,232.73	90.39

Vegetation Association/land system	Description	Pre-European extent (ha)	Current extent (ha)	% Remaining
	Geology: Quaternary mudflat deposits, clay, salt and sand; eolian sand. Geomorphology: 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.			



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Vegetation Association (Beard 1979) within the DE

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FIGURE 6-2
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FIGURE 6-2
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G:\61\12582802\GIS\Maps\Working\12582802_EPA\12582802_EPA.aprx\12582802_EPA_006_2_Vegetation_Association_RevB
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Kilometres

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

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Vegetation Association (Beard 1979) within the DE

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FIGURE 6-2
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G:\61\12582802\GIS\Maps\Working\12582802_EPA\12582802_EPA.aprx\12582802_EPA_006_2_Vegetation_Association_RevB
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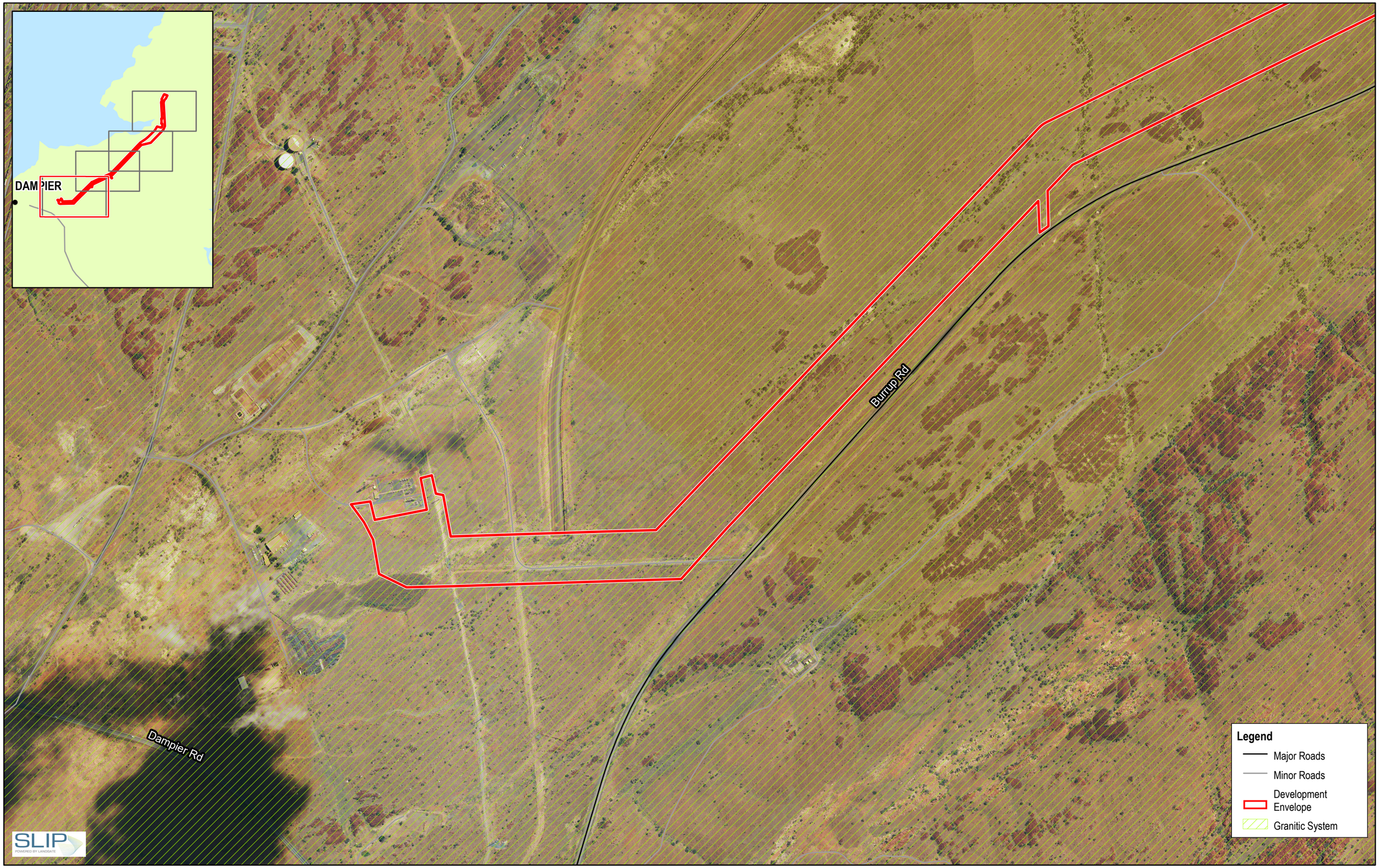

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Map Projection: Transverse Mercator
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Grid: GDA 1994 MGA Zone 50

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Land Systems within the DE

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FIGURE 6-3
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G:\61\12582802\GIS\Maps\Working\12582802_EPA\12582802_EPA.aprx\12582802_EPA_006_3_Land_Systems_RevB
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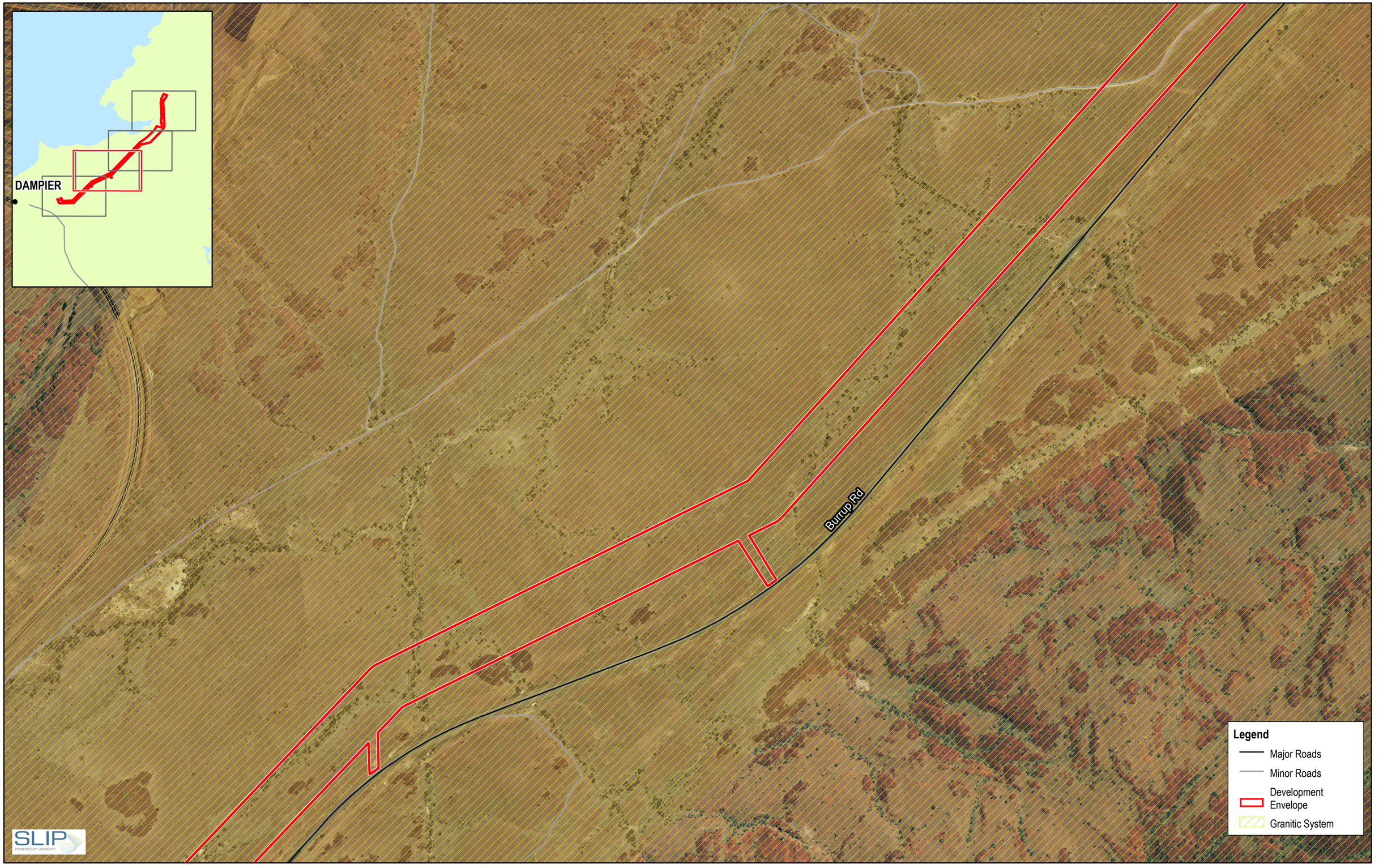

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Kilometres

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

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Land Systems within the DE

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FIGURE 6-3
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G:\61\12582802\GIS\Maps\Working\12582802_EPA\12582802_EPA.aprx\12582802_EPA_006_3_Land_Systems_RevB
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Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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FIGURE 6-3
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G:\61\12582802\GIS\Maps\Working\12582802_EPA\12582802_EPA.aprx\12582802_EPA_006_3_Land_Systems_RevB
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Kilometres

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

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Land Systems within the DE

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G:\61\12582802\GIS\Maps\Working\12582802_EPA\12582802_EPA.aprx\12582802_EPA_006_3_Land_Systems_RevB
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6.1.2.3 Vegetation

Types and condition

The 85.61 ha DE comprises 79.04 ha of native vegetation representing thirteen vegetation types (VTs) (VLA 2019, GHD 2019, 2020a & 2022). The remaining land within the DE (6.57 ha) is cleared, with these areas containing roads (and associated infrastructure), tracks and areas cleared for farming (VLA 2019, 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. Development of the Proposal requires clearing of up to 14.40 ha of native vegetation, of which up to 2.90 ha is temporary and will be rehabilitated immediately following construction.

The surveys (VLA 2019, GHD 2019, 2020a & 2022) also recorded vegetation condition across the DE. The DE comprises 79.04 ha native vegetation, of which 0.57 ha (0.7%) is in Excellent condition, 53.17 ha (67.3%) is in Very Good condition, 21.55 ha (27.3%) is in Good condition, and the remaining 3.75 ha (4.7%) is in Degraded or worse condition (VLA 2019, GHD 2019, 2020a & 2022).

Completely Degraded or Poor condition vegetation is associated with previously cleared and disturbed areas adjacent 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).

Table 6-5 provides a summary of the VTs and vegetation condition within the DE. The distribution of VTs within the DE is shown on Figure 6-4 and vegetation condition on Figure 6-5.

Table 6-5 Mapped vegetation types within the Burrup DE

Vegetation type	Vegetation description	Vegetation Extent (ha) within DE	Condition	Condition Extent (ha) within DE
AbCc	*Acacia bivenosa* tall open to shrubland over **Cenchrus ciliaris* tussock grassland, sometimes closed tussock grassland, with patchy *Triodia angusta.*	0.02 ha	Degraded	0.02 ha
AbImTe	*Acacia bivenosa, Acacia pyrifolia* subsp *morrisonii, Grevillea pyramidalis* open shrubland over *Indigofera monophylla, Corchorus walcottii* open low shrubland over *Triodia epactia* hummock grassland with patchy **Cenchrus ciliaris* tussock grassland.	0.02 ha	Good	0.02 ha

Vegetation type	Vegetation description	Extent (ha) within DE	Condition	Extent (ha) within DE
EvAbTa	*Eucalyptus victrix* open to scattered low woodland with scattered *Corymbia hamersleyana* over *Acacia bivenosa* tall open shrubland over *Adriana tomentosa / Indigofera monophylla* open low shrubland over *Triodia angusta / T. epactia* open to hummock grassland.	0.02 ha	Very Good	0.02 ha
GpCc	*Grevillea pyramidalis* (regenetrating) scattered to open tall shrubland over **Cenchrus ciliaris* tussock and *Triodia epactia* hummock grassland	0.02 ha	Poor	0.02 ha
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 monophylla* shrubland.	0.34 ha	Excellent	0.33 ha
			Very Good	0.01 ha
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*	0.01 ha	Excellent	0.01 ha
Tspp	*Tecticornia halocnemoides* subsp *tenuis, T. pruinosa, T. indica* subsp *leiostachya,*with *Muellerolimon salicorniaceum* open low shrubland with patchy *Avicennia marina* trees.	0.23 ha	Excellent	0.23 ha
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 ambiguus* and **Cenchrus ciliaris* open tussock grassland and *Tinospora smilacina* and *Ipomoea costata* open vineland on rock piles.	1.73 ha	Very Good	1.47 ha
			Good	0.26 ha

Vegetation type	Vegetation description	Extent (ha) within DE	Condition	Extent (ha) within DE
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 over *Hybanthus aurantiacus, Cleome viscosa* and *Trichodesma zeylanicum* var. *zeylanicum* open forbland on brown sandy loam on elevated rocky plain.	2.39 ha	Very Good	2.00 ha
			Good	0.19 ha
			Poor	0.20 ha
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 australe* scattered herbs on rocky sandy loam on minor drainage lines.	6.56 ha	Very Good	5.60 ha
			Good	0.96 ha
VT04	*Tecticornia indica* subsp. *Leiostachya* and *Tecticornia pterygosperma* low chenopod shrubland with scattered *Avicennia marina* on saline flats with tidal inundation.	5.56 ha	Very Good	4.77 ha
			Good	0.79 ha
VT05	**Cenchrus ciliaris* open grassland over *Trianthema turgidifolia* and *Neobassia astrocarpa* open chenopod shrubland on disturbed edges of saline flats.	3.27 ha	Very Good	0.30 ha
			Good	2.06 ha
			Poor	0.91 ha
VT06	*Grevillea pyramidalis* subsp. *Pyramidalis* and **Vachellia farnesiana* scattered shrubs over *Ipomoea costata, Indigofera monophylla* 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.	58.87 ha	Very Good	39.0 ha
			Good	17.30 ha
			Poor	2.27 ha
			Completely Degraded	0.30 ha
Total native vegetation		**79.04 ha**		
Cleared		**6.57 ha**		
Total		**85.61 ha**		

Significant ecological communities

No State or Commonwealth listed TECs were recorded within the DE, however, one DBCA-listed PEC was recorded (VLA 2019, GHD 2019 & 2020a):

- Burrup Peninsula rock pile communities (Priority 1).

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. The communities are different from those of the Hamersley and Chichester Ranges (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 (*Cenchrus ciliaris* – buffel grass, *Passiflora foetida* – stinking passionflower, *Aerva javanica* – kapok) (DBCA 2022).

Within the DE, vegetation types VT01, GpTeBaTs and TsIcTe are considered to represent the 'Burrup Peninsula rock pile communities' PEC with a total mapped extent of 2.07 ha within the DE (Figure 6-6).

Other significant vegetation

Several drainage lines intersect the DE. Minor drainage lines which dissect the plain and rocky slopes are lined by *Corymbia hamersleyana* and mostly *Eucalyptus victrix* (GHD 2020a). Within the DE, VT03 and EvAbTa are considered to represent riparian vegetation (Figure 6-7). There is 6.56 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 9.11 ha of intertidal adapted vegetation within the DE.

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Kilometres

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

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Horizon Power
Burrup Expansion Program

Vegetation Types within the DE

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FIGURE 6-4
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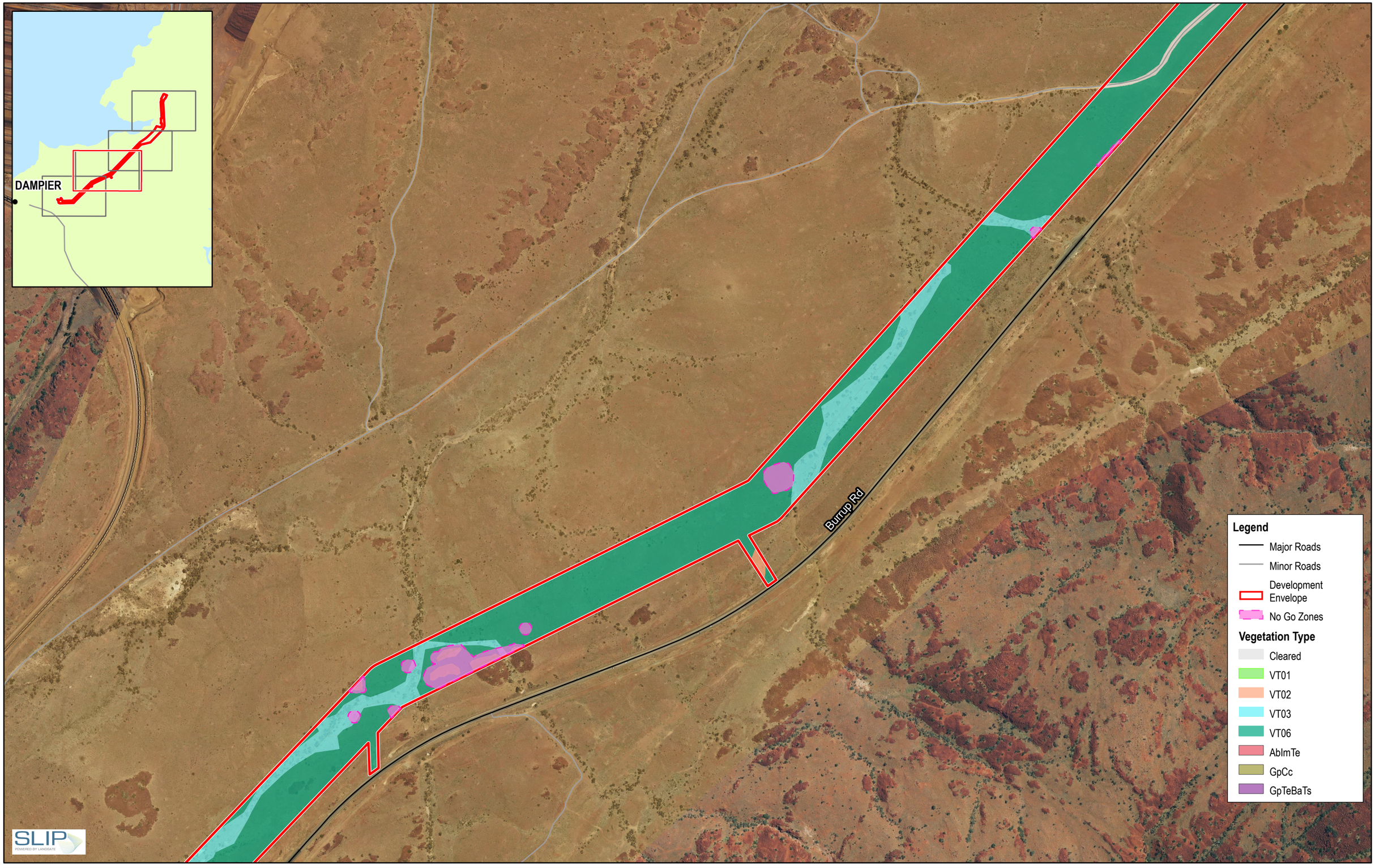

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Vegetation Types within the DE

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FIGURE 6-4
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Map Projection: Transverse Mercator
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Vegetation Types within the DE

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Date **07/11/2022**

FIGURE 6-4
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G:\61\12582802\GIS\Maps\Working\12582802_EPA\12582802_EPA.aprx\12582802_EPA_006_4_RevD_Vegetation_Types
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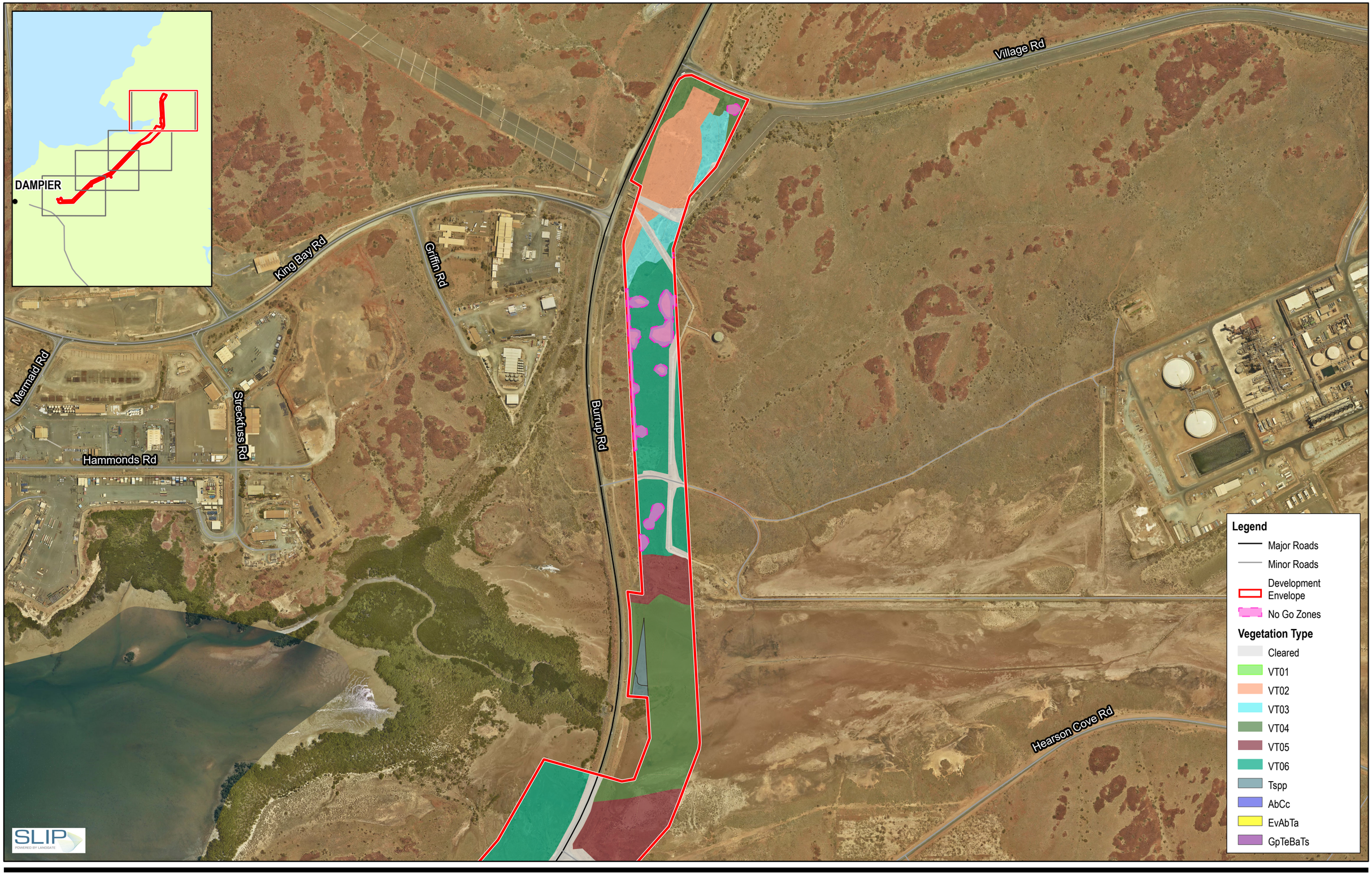

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Vegetation Types within the DE

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FIGURE 6-4
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Vegetation Condition within the DE

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FIGURE 6-5
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Map Projection: Transverse Mercator
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Vegetation Condition within the DE

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FIGURE 6-5
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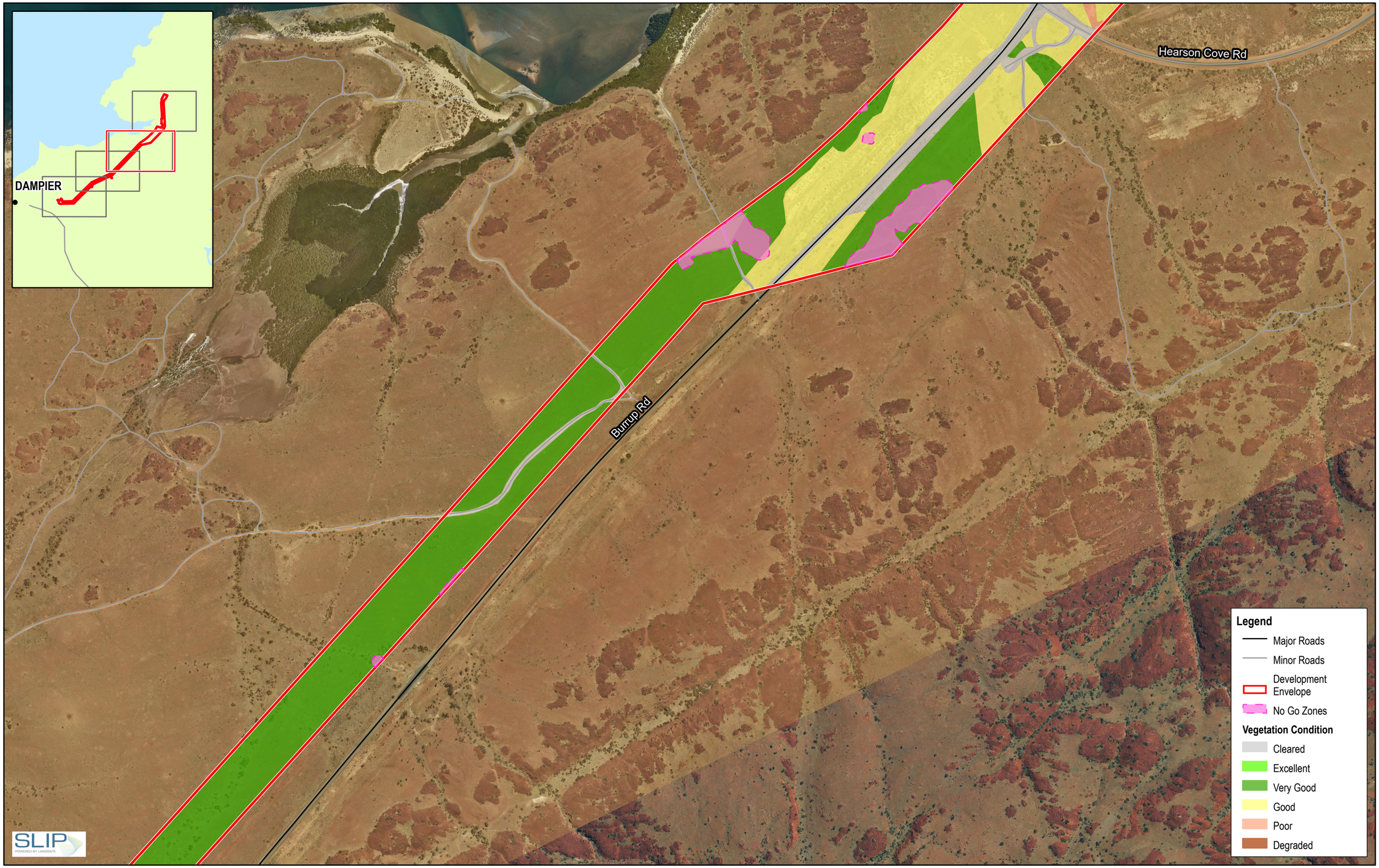

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Vegetation Condition within the DE

Project No. **12582802**
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FIGURE 6-5
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Kilometres

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

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Vegetation Condition within the DE

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FIGURE 6-5
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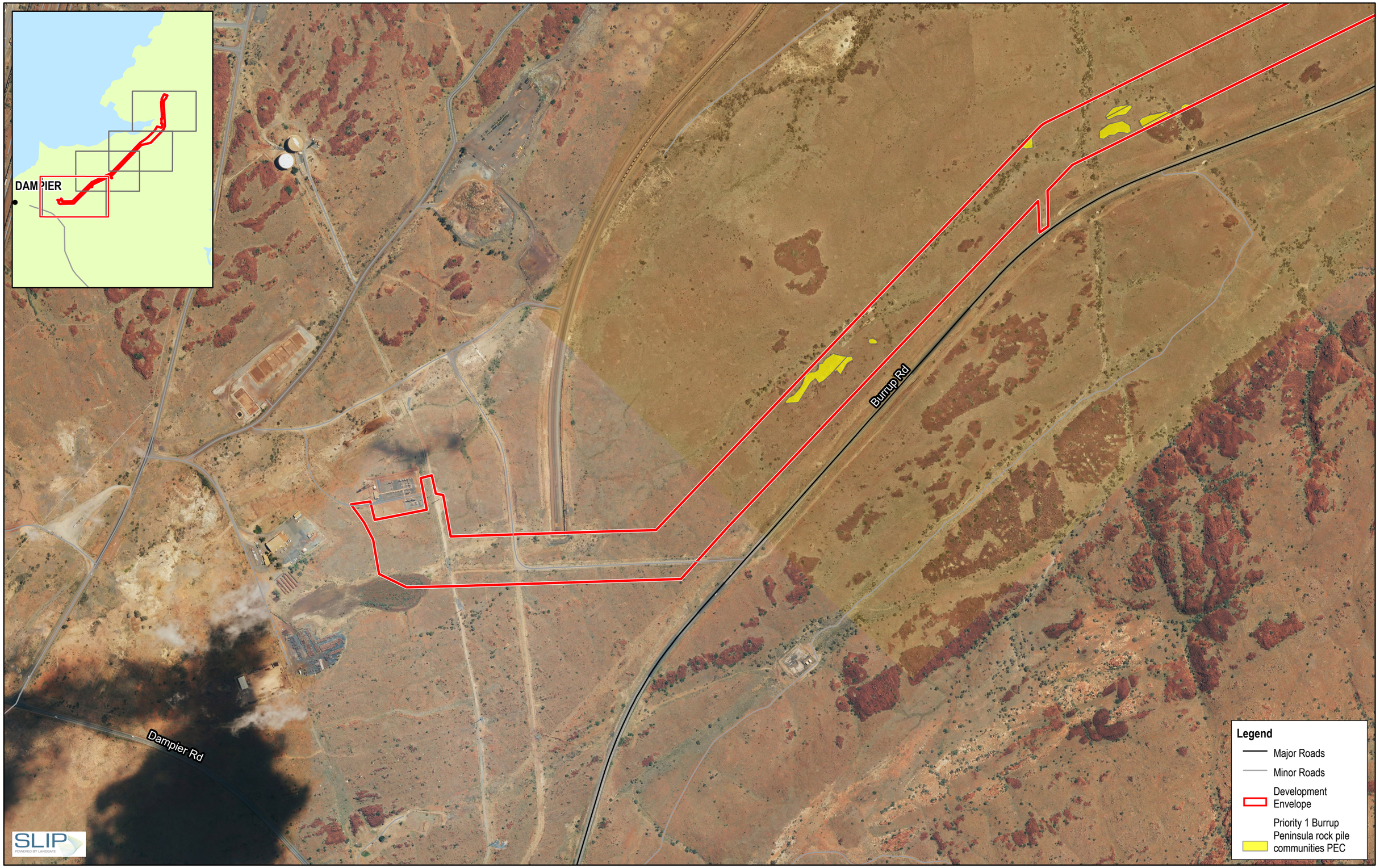

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Map Projection: Transverse Mercator
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Grid: GDA 1994 MGA Zone 50

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Burrup Expansion Program

Significant Vegetation Communities within the DE

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FIGURE 6-6
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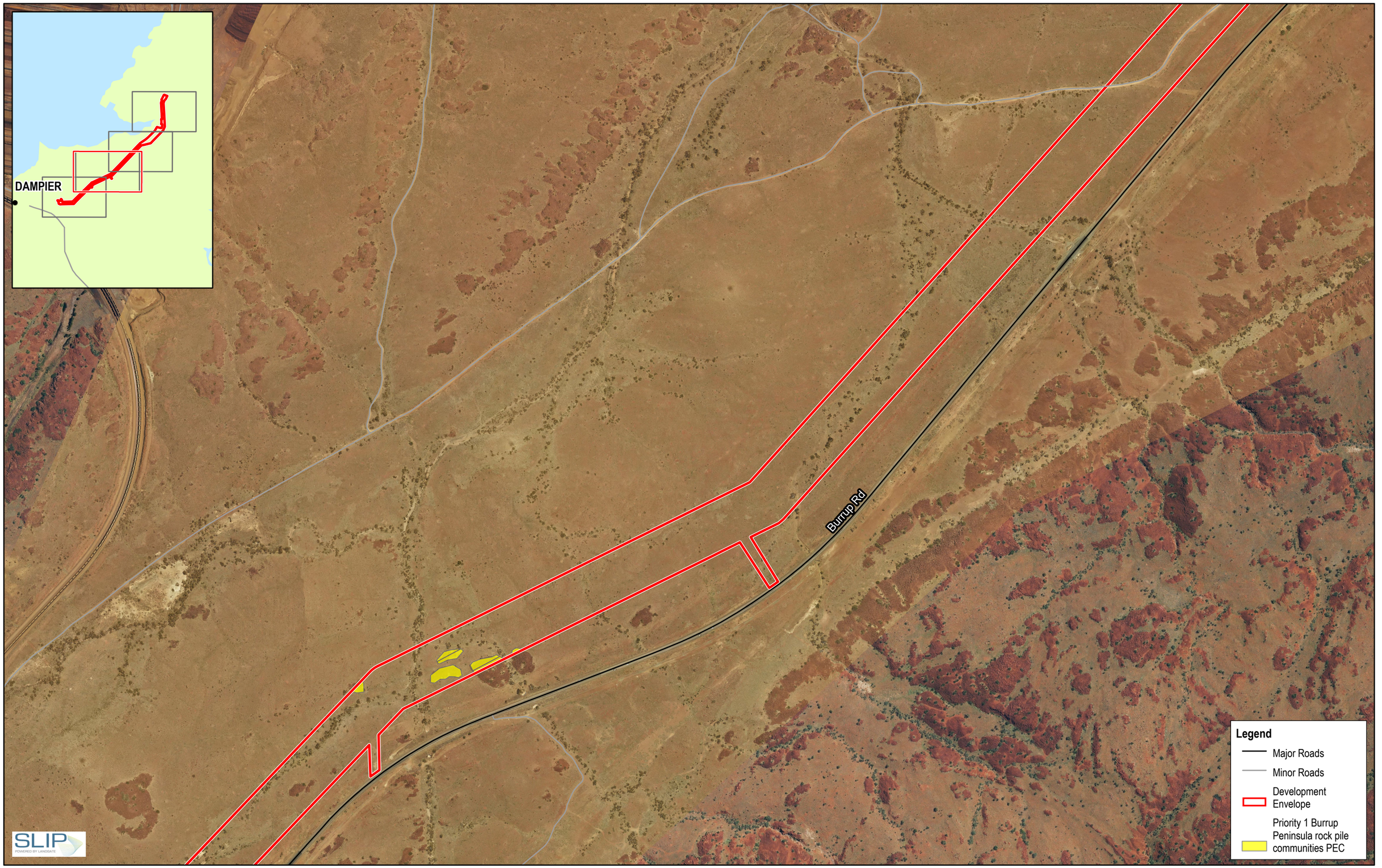

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Significant Vegetation Communities within the DE

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FIGURE 6-6
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Burrup Expansion Program

Significant Vegetation Communities within the DE

Project No. **12582802**
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Date **07/11/2022**

FIGURE 6-6
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Significant Vegetation Communities within the DE

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FIGURE 6-6
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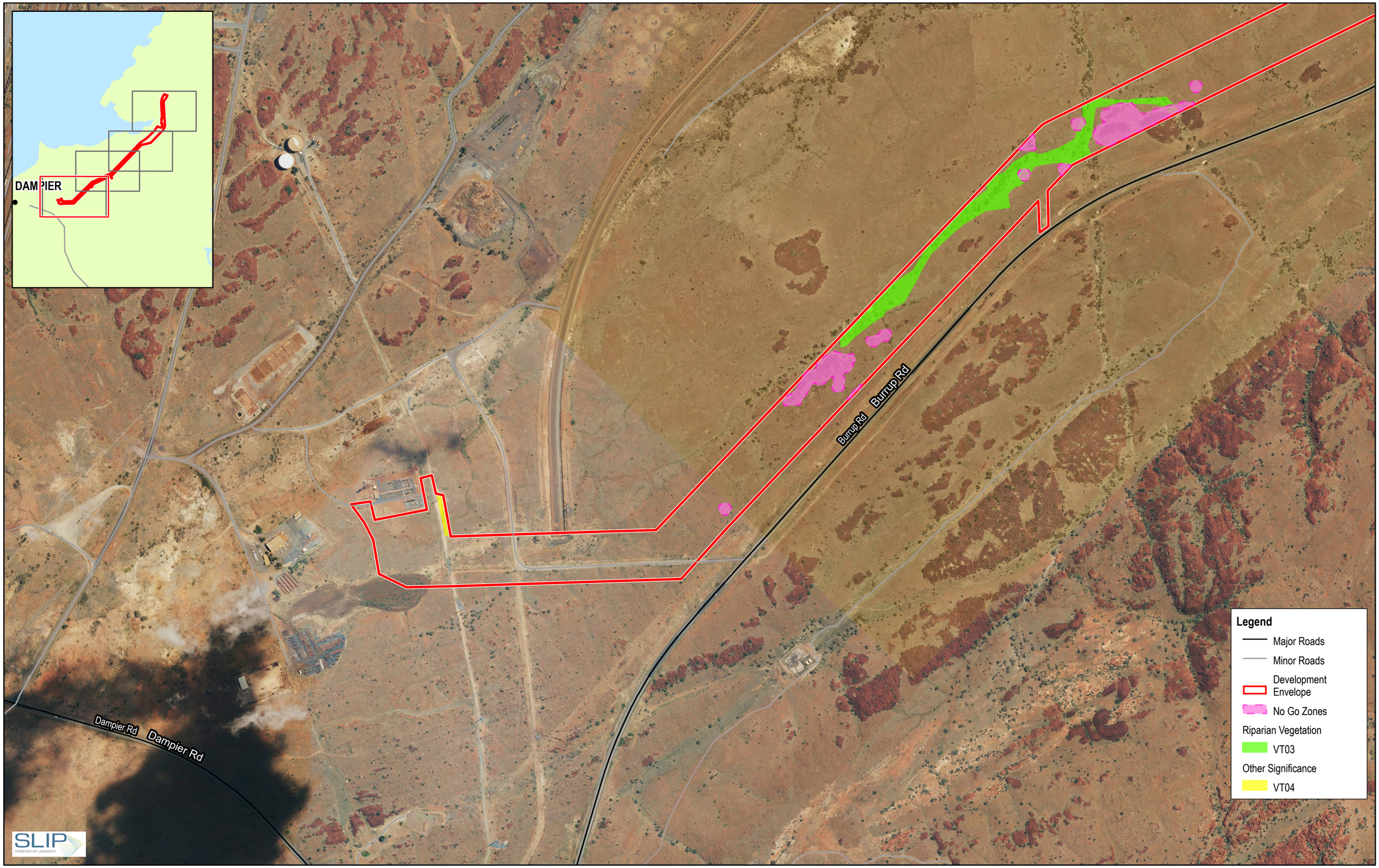

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Riparian Vegetation within the DE

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FIGURE 6-7
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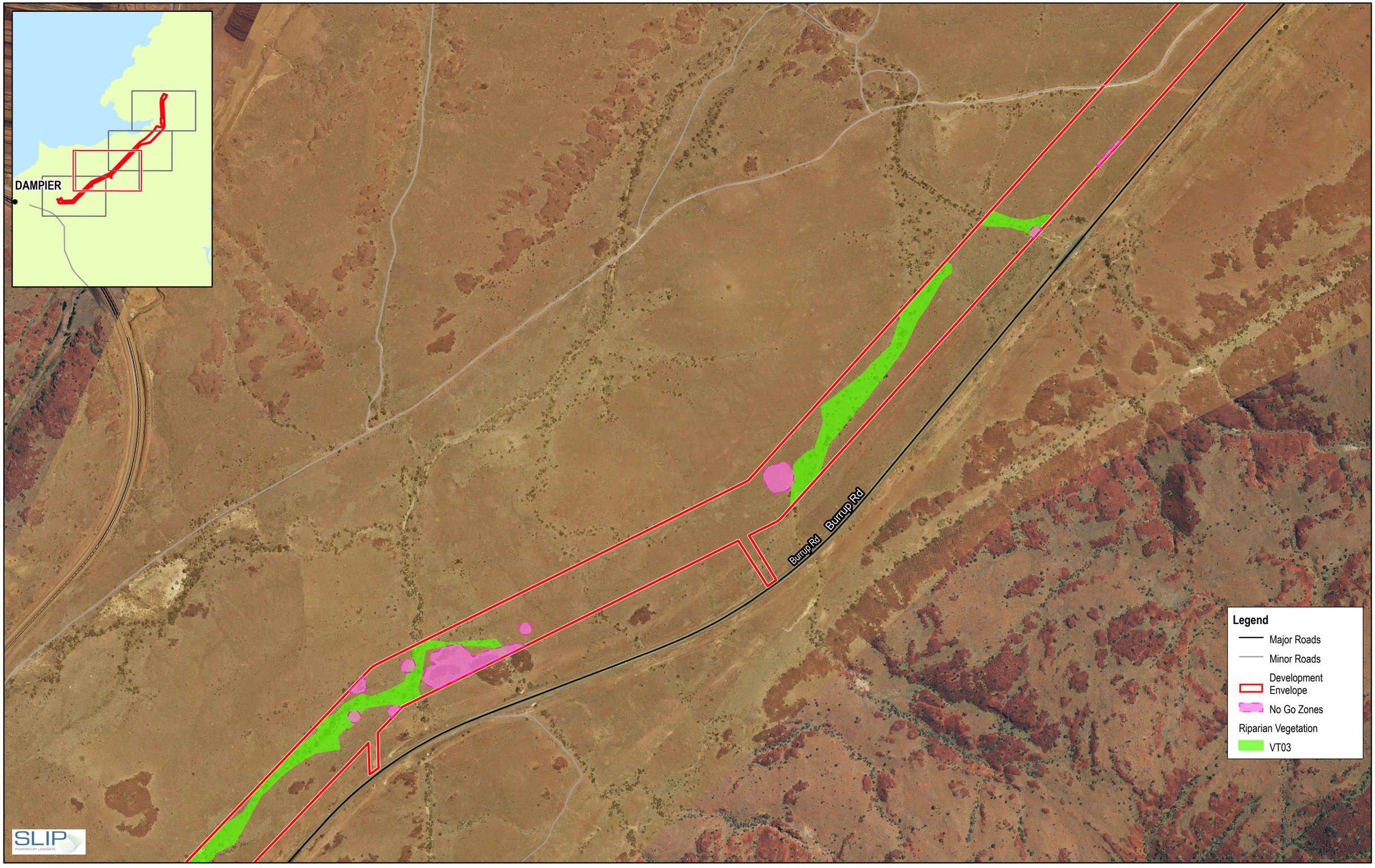

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Burrup Expansion Program

Riparian Vegetation within the DE

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FIGURE 6-7
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Riparian Vegetation within the DE

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FIGURE 6-7
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G:\61\12582802\GIS\Maps\Working\12582802_EPA\12582802_EPA.aprx\12582802_EPA_006_7_RevC_Other_Significant_Vegetation
Print date: 07 Nov 2022 - 15:23

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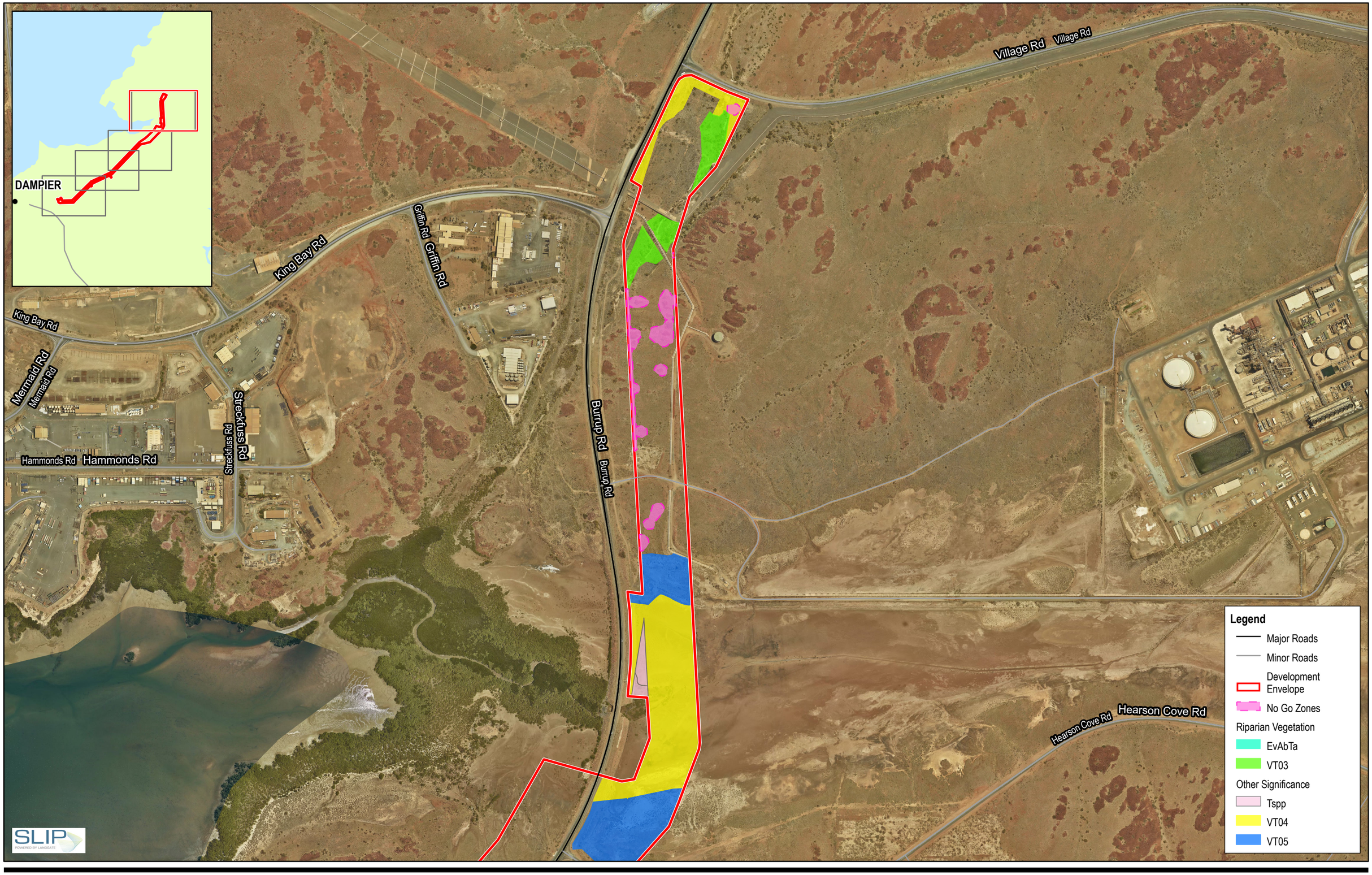

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Kilometres

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

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Riparian Vegetation within the DE

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FIGURE 6-7
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G:\61\12582802\GIS\Maps\Working\12582802_EPA\12582802_EPA.aprx\12582802_EPA_006_7_RevC_Other_Significant_Vegetation
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6.1.2.4 Flora

Flora diversity

Across the wider survey areas, a total of 138 flora taxa (including subspecies and varieties), comprising 40 families and 91 genera were identified (VLA 2019, GHD 2019 & 2020a). The Fabaceae, Poaceae and Malvaceae families had the highest levels of species richness.

Introduced flora

One introduced flora taxa, *Passiflora foetida* (Passionflower), was recorded within the DE during the surveys (VLA 2019, GHD 2019 & 2020a). This species is not listed as a Weed of National Significance (WoNS) or Declared Plant.

Significant flora

Desktop searches completed by VLA (2019) and GHD (2020a) identified the presence/potential presence of six significant flora taxa within a 20 km radius of the wider survey areas. This total comprised five Priority 3 taxa and one Priority 4 taxon.

No EPBC Act or BC Act listed flora taxa were recorded within the DE during the VLA (2019) survey or the GHD (2019, 2020a & 2022) surveys. Three DBCA-listed Priority species were recorded within the DE (Figure 6-8):

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

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.

Rhynchosia bungarensis (Priority 4)

Rhynchosia bungarensis is listed Priority 4 and is a compact, prostrate shrub, to 0.5 m high with yellow flowers. It is known to occur on pebbly, shingly coarse sand amongst boulders and banks of flow line in the mouth of a gully wall (Western Australian Herbarium 1998).

There are 84 records of *Rhynchosia bungarensis* (Priority 4) reported on FloraBase across WA, with records showing individuals to be occasional to common. The total number of individuals of *R. bungarensis* is estimated to be 236[1].

This species was recorded within the DE, in the cracks of the incised boulders. Within the DE there are six individuals of this species. Construction of the Proposal will clear no more than six individuals of *Rhynchosia bungarensis.*

[1] Source: *FloraBase* (WA Herbarium 1998–), VLA (2019) and GHD (2019, 2020a & 2022). *FloraBase* records often provide the count (frequency) in descriptors such as common, occasional and scattered without providing an actual number of plants. For the purposes of this assessment these records have been counted as one individual. As such the estimates are underrepresented with the actual number of individuals expected to be much higher. Therefore, the percent impact calculated is considered to be very conservative.

Terminalia supranitifolia (Priority 3)

Terminalia supranitifolia is a spreading, tangled shrub or tree, 1.5-3 m high with green-yellow flowers appearing in May, July or September. It is listed Priority 3 by DBCA. Habitat includes sandy areas among basalt rocks (Western Australian Herbarium 1998).

This species was recorded in the cracks of the incised boulders, and occasionally on rocky and grassy slopes leading to the rockpiles. There are 54 *FloraBase* records of this species within WA, with sparse records of plants at each location. The total number of individuals of *T. supranitifolia* is estimated to be 223[1].

Within the DE there are 34 individuals of this species. Construction of the Proposal will clear no more than 19 individuals of *Terminalia supranitifolia.*

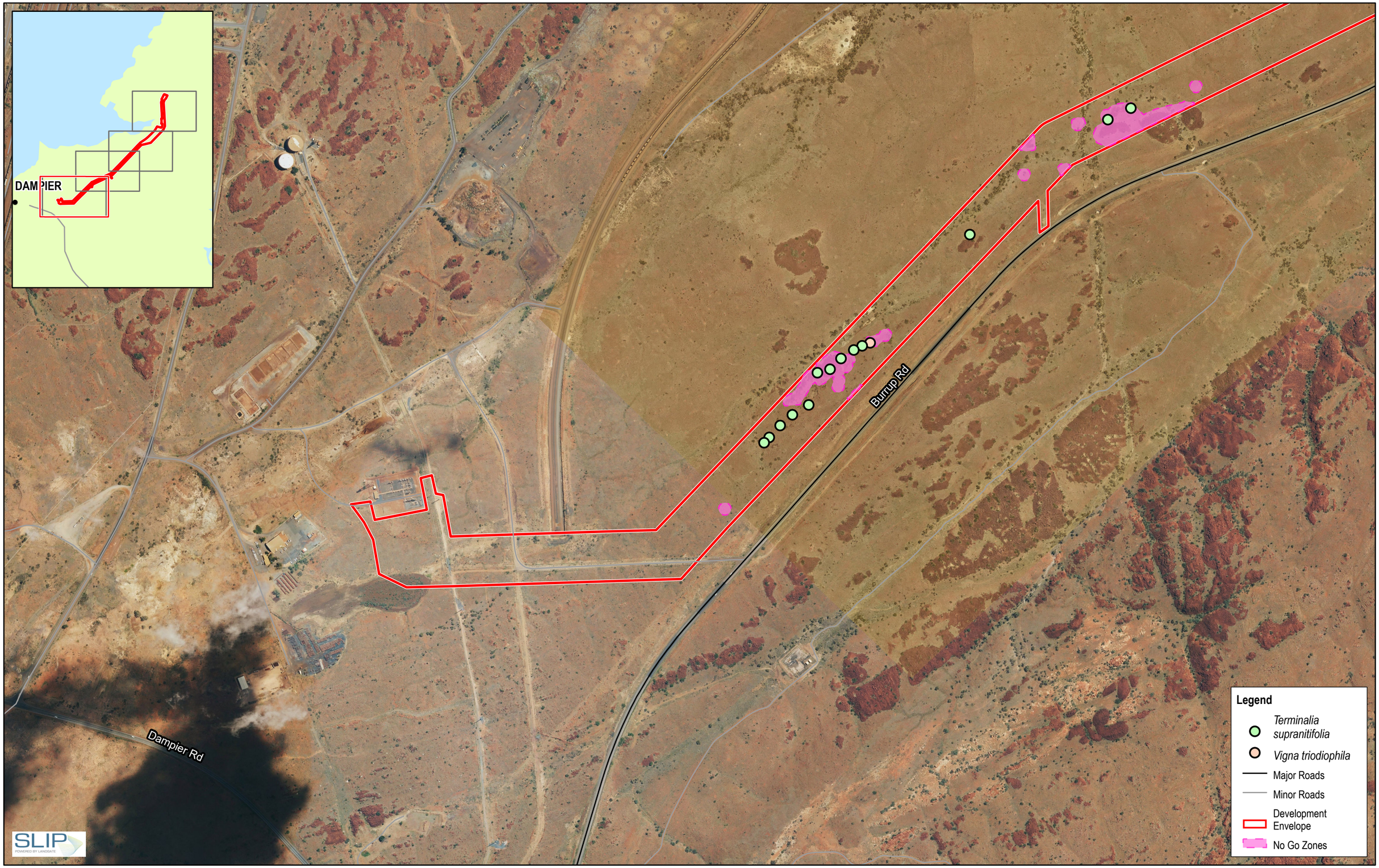
Vigna tridiophila (Priority 3)

Vigna triodiophila is a fine-stemmed prostrate or scrambling vine with small, ovate to elliptic leaves and known to flower and fruit between May and September. It is listed Priority 3 by DBCA. The species is endemic to basalt rockpile habitats in shallow, red-brown or brown, clayey sand or loam.

Vigna triodiophila was recorded within rockpiles on the Burrup Peninsula and was not common. There are 16 *FloraBase* records of this species within WA, with frequency of plants recorded ranging from uncommon to occasional. Within the Burrup DE there are five individuals of this species. Construction of the Proposal will avoid all records of *Vigna triodiophila* individuals within the DE.

6.1.2.5 Conservation and Environmentally Sensitive Areas

No DBCA managed lands intersect the DE, however the Murujuga National Park is located within close proximity, approximately 100 m north and 180 m east of the DE (Figure 6-9). No ESA's intersect the DE.



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Kilometres

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

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Significant Flora within the DE

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FIGURE 6-8
Page 1 of 4

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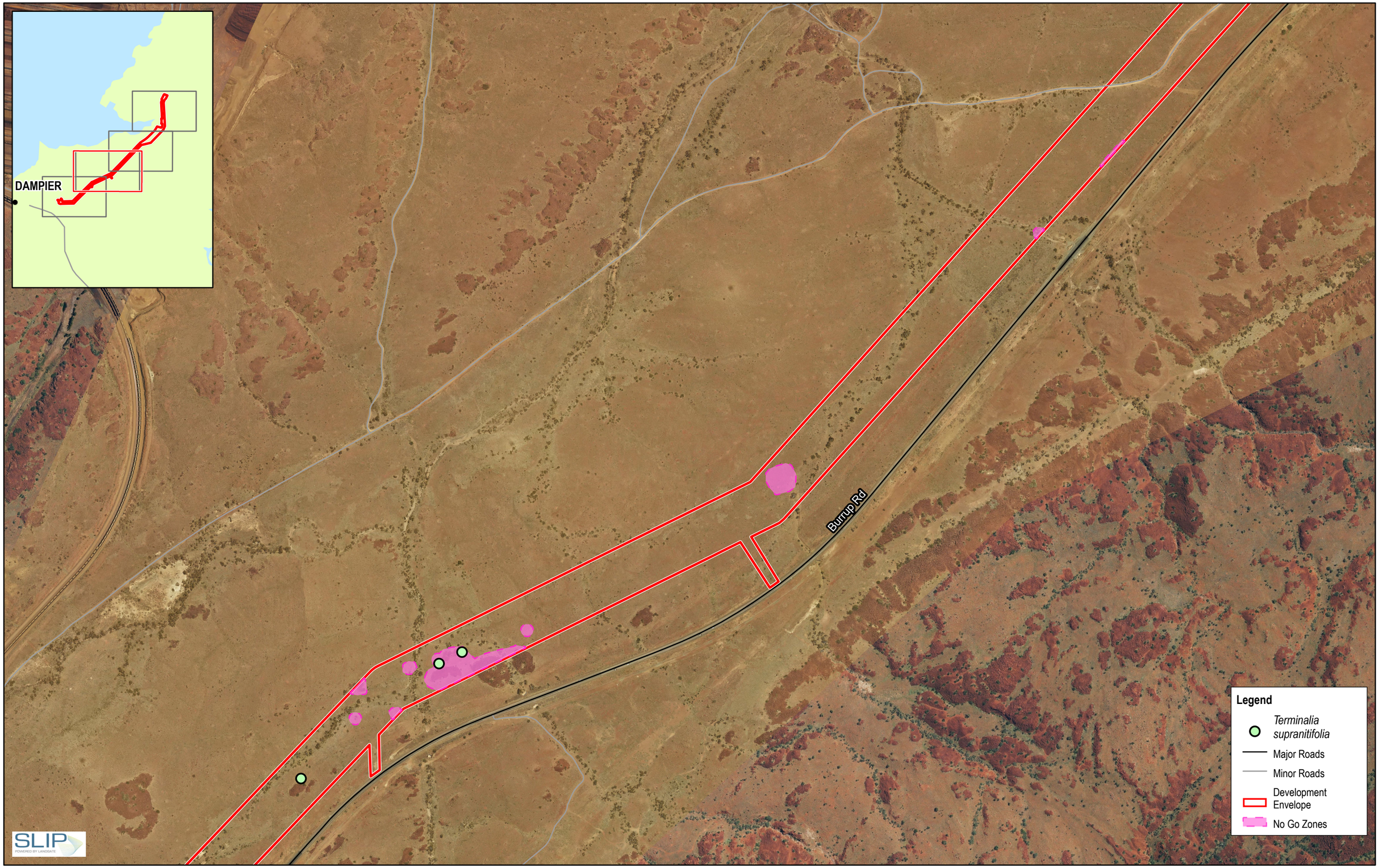

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Map Projection: Transverse Mercator
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Grid: GDA 1994 MGA Zone 50

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Horizon Power
Burrup Expansion Program

Significant Flora within the DE

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FIGURE 6-8
Page 2 of 4

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Horizon Power
Burrup Expansion Program

Significant Flora within the DE

Project No. **12582802**
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FIGURE 6-8
Page 3 of 4

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

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Burrup Expansion Program

Significant Flora within the DE

Project No. **12582802**
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Date **07/11/2022**

FIGURE 6-8
Page 4 of 4

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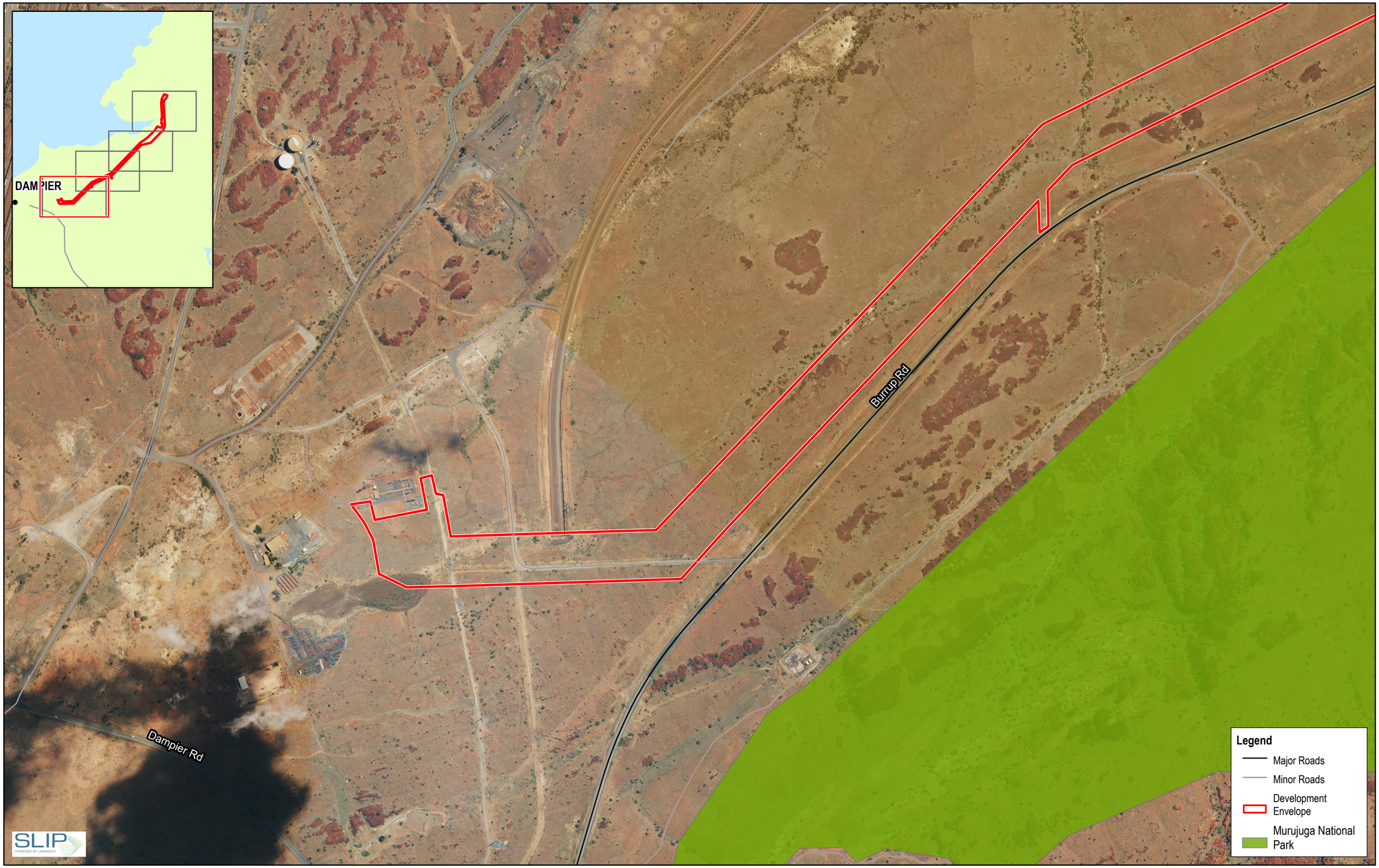

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Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 50

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Horizon Power
Burrup Expansion Program

Conservation Areas within the Vicinity of the DE

Project No. **12582802**
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FIGURE 6-9
Page 1 of 4

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

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Burrup Expansion Program

Conservation Areas within the Vicinity of the DE

Project No. **12582802**
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FIGURE 6-9
Page 2 of 4

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Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
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Conservation Areas within the Vicinity of the DE

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FIGURE 6-9
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Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
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Conservation Areas within the Vicinity of the DE

Project No. **12582802**
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FIGURE 6-9
Page 4 of 4

G:\61\12582802\GIS\Maps\Working\12582802_EPA\12582802_EPA.aprx\12582802_EPA_006_9_RevB_Conservation_Areas
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6.1.3 Potential impacts

6.1.3.1 Direct impacts

The Proposal will result in the loss of flora and vegetation as a result of clearing required during construction. Construction of Proposal will not require the clearing of all riparian and other significant vegetation within the DE. However, as the final design of the Proposal is not yet confirmed, this referral ensures a conservative approach by assessing the impact of clearing all of this vegetation within the DE.

Operation of the Proposal will not directly impact flora and vegetation as maintenance activities will use existing roads or access tracks established during construction.

Direct impacts to vegetation and flora during construction of the Proposal includes:

- Native vegetation:
    - Clearing of up to 14.40 ha of native vegetation (including 11.50 ha of permanent clearing and 2.90 ha of temporary clearing) including:
        - Native vegetation across thirteen VTs;
        - Native vegetation mapped across Vegetation Association 117; and
        - Native vegetation mapped across the Granitic and Littoral Land Systems
    - Clearing of up to 2.50 ha of riparian vegetation (indicative clearing in current design of approximately 0.72 ha);
    - Clearing of up to 1.50 ha of vegetation located within the tidal inlet between Hearson Cove and King Bay (indicative clearing in current design of approximately 0.47 ha); and
    - Clearing of up to 0.05 ha of the Priority 1 Burrup Peninsula rock pile communities PEC in the unlikely event that construction of the Proposal is constrained by Aboriginal cultural heritage within the northern quarter of the DE (i.e. an unexpected find during initial ground disturbing works)
- Significant flora
    - Clearing of up to 19 individuals of *Terminalia supranitifolia* (Priority 3); and
    - Clearing of up to six (6) individuals of *Rhynchosia bungarensis* (Priority 4).

The Proposal will avoid impacts to *Vigna tridiophila* (Priority 3) individuals. In addition, no direct impacts to the Murujuga National Park will occur as a result of the Proposal.

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 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.

6.1.3.2 Indirect impacts

Construction and operation of the Proposal may result in the following indirect impacts to vegetation and flora:

- Introduction and/or the spread of weeds;
- Alteration of fire regimes;
- Alteration to hydrological flows; and
- Spills or leaks of chemical, hydrocarbon and/or hazardous materials.

6.1.3.3 Cumulative impacts

Impacts to aspects of Flora and Vegetation in proximity to the Proposal were identified through the collation of information from clearing permits and environmental referrals for other Proposals (Table 6-6). Proposals used to inform cumulative impacts to flora and vegetation include the Yara Ammonia Plant (and Renewable Hydrogen Project) and the Perdaman Urea Project (refer to Section 9.1 for an overview of the CIA methodology).

Table 6-6 Cumulative impacts to flora and vegetation from other Proposals

Aspect / Project	Burrup Common User Transmission Infrastructure Current Proposal	Yara Ammonia Plant and Renewable Hydrogen Project	Perdaman Urea Project	North West Shelf Project Extension	Pluto North West Shelf Interconnector Pipeline	Native Vegetation Clearing Permits	Cumulative impact
Proponent	Horizon Power	Yara Pilbara Fertilisers Pty Ltd	Perdaman Chemical and Fertilisers Pty	Woodside Energy Ltd	AGI Operations Pty Ltd	Multiple	N/A
Proposed Project commencement	2023	2021	2020 - 2023	N/A – currently operational under existing Ministerial Statement 536 – Karratha Gas Plant	2022	N/A	N/A
Description	Development of a 132 kV overhead transmission line between the Dampier Substation and the proposed Burrup Substation (the Proposal).	Development of a Renewable Hydrogen Plant and associated infrastructure, including a dedicated solar photovoltaic (PV) farm, electrolyser and its balance of plant, and supporting infrastructure, including site tracks.	Construction and operation of a urea plant with a production capacity of approximately 2 million tonnes per annum (Mtpa) within the Burrup Strategic Industrial Area (BSIA) on the Burrup Peninsula.	Continuation and extension of the operating life of the NWS Project (MS 536).	Design and construction of an interconnector pipeline, connecting the Pluto Interconnector Compressor to the Pluto LNG Plant.	Approved Native Vegetation Clearing Permits.	N/A

Aspect / Project	Burrup Common User Transmission Infrastructure Current Proposal	Yara Ammonia Plant and Renewable Hydrogen Project	Perdaman Urea Project	North West Shelf Project Extension	Pluto North West Shelf Interconnector Pipeline	Native Vegetation Clearing Permits	Cumulative impact
Location	City of Karratha, WA Located in the Murujuga (Burrup Peninsula), approximately 1.5 km east of the Dampier township in the Pilbara region.	City of Karratha, WA Located in the Murujuga (Burrup Peninsula), approximately 11 km north-west of Karratha in the Pilbara region of the north-west of WA.	City of Karratha, WA Located approximately 8 km north-east of Dampier and 20 km north-west of Karratha (in the Murujuga (Burrup Peninsula)).	City of Karratha, WA Located approximately 8 km north-east of Dampier and 20 km north-west of Karratha (in the Murujuga (Burrup Peninsula)).	City of Karratha, WA Located approximately 8 km north-east of Dampier and 20 km north-west of Karratha (in the Murujuga (Burrup Peninsula)).	Within 10 km of the current Proposal.	N/A
Proposed native vegetation clearing	Up to 14.40 ha of native vegetation.	Up to 29.00 ha of native vegetation.	73.00 ha of native vegetation clearing.	No additional clearing of native vegetation.	10.69 ha of native vegetation	1,350.80 ha*	Combined removal of up to 1,432.89 ha native vegetation in varying condition (including 1,350.80 ha associated with approved clearing permits).
Pre-European complexes affected	14.40 ha native vegetation associated with Vegetation Association 117.	29.00 ha native vegetation associated with Vegetation Association 117.	N/A	N/A	10.69 ha of native vegetation associated with Vegetation Association 117.	N/A	54.09 ha Vegetation Association 117.

Aspect / Project	Burrup Common User Transmission Infrastructure Current Proposal	Yara Ammonia Plant and Renewable Hydrogen Project	Perdaman Urea Project	North West Shelf Project Extension	Pluto North West Shelf Interconnector Pipeline	Native Vegetation Clearing Permits	Cumulative impact
Significant vegetation affected	• Up to 0.05 ha of Burrup Peninsula rock pile communities PEC (worst case); • Loss of up to 2.50 ha of riparian vegetation; and • Loss of up to 1.50 ha of locally significant vegetation.	• No impacts Burrup Peninsula rock pile communities PEC; and • Impact to up to 6.21 ha of locally significant vegetation.	• Loss of 0.13 ha Burrup Peninsula rock pile communities PEC.	N/A	• Loss of 1.65 ha of locally significant vegetation.	N/A	• Removal of up to 0.18 ha Burrup Peninsula rock pile communities PEC; • Combined clearing of up to 2.50 ha of riparian vegetation; and • Combined impact to up to 9.36 ha of locally significant vegetation.

Aspect / Project	Burrup Common User Transmission Infrastructure Current Proposal	Yara Ammonia Plant and Renewable Hydrogen Project	Perdaman Urea Project	North West Shelf Project Extension	Pluto North West Shelf Interconnector Pipeline	Native Vegetation Clearing Permits	Cumulative impact
Significant flora affected	• Loss of up to 19 individuals of *Terminalia supranitifolia* (Priority 3); and • Loss of up to 6 individuals of *Rhynchosia bungarensis* (Priority 4).	• Loss of up to 2 individuals of *Terminalia supranitifolia* (Priority 3)	• Loss of up to 1 individuals of *Terminalia supranitifolia* (Priority 3); and • Loss of up to 1 individual of *Rhynchosia bungarensis* (Priority 4).	N/A	• Loss of 5 individuals of *Terminalia supranitifolia* (Priority 3); and • Loss of up to 11 individuals of *Rhynchosia bungarensis* (Priority 4).	N/A	• Combined reduction of approximately 25 individuals of *Terminalia supranitifolia* (Priority 3); and • Combined reduction of approximately 18 individuals of *Rhynchosia bungarensis* (Priority 4).

*The clearing number (1,350.80 ha) is attributed to Native Vegetation Clearing Permits within 10 km of the Proposal DE (mainland areas included)

6.1.4 Mitigation

6.1.4.1 Construction

The Proposal has been designed to avoid and/or mitigate impacts to flora and vegetation where possible. During the design phase, particular focus has been, and will be, placed on reducing the amount of clearing required for construction.

Avoidance measures considered and incorporated into Proposal planning to date include:

- Pole placement and span has been designed to avoid impacts to vegetation (including PECs) and significant flora where possible;
- Clearing for unsealed access tracks has been reduced to a trafficable width of approximately 4 m; and
- No-go zones have been developed to avoid impacts to PECs and significant flora where possible.

In addition, the DE contains a number of recently cleared access tracks which were mapped as vegetated during the biological surveys (Plate 1 and Plate 2). These access tracks will be utilised during construction of the Proposal where possible, to avoid and reduce the amount of native vegetation clearing required.

Plate 1 Recently cleared access tracks within the DE

Plate 2 Recently cleared access tracks within the DE

Impacts to flora and vegetation will be minimised and reduced through the following mitigation measures:

- Clearing for unsealed access tracks has been optimised to a minimum trafficable width;
- Clearing impacts will be further reduced through the detailed design process, including the positioning of access tracks, poles and pole pads to minimise impacts to vegetation (including PECs) and flora;
- Any clearing of a temporary nature will be rehabilitated upon completion of construction;
- Pole placement will avoid drainage lines, where possible, minimising impacts to riparian 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 and flora within this area;
- Pole locations utilise the proposed Burrup Road realignment (to be implemented by Main Roads), reducing the amount of clearing required for access tracks; and
- Implementation of the management measures in the Construction Environment Management Plan (CEMP) (Appendix 1) to minimise risks to vegetation and flora, and to provide monitoring during construction.

6.1.4.2 Operation

Operational activities associated with the Proposal include maintenance inspections and repairs. Operation of the Proposal will utilise existing roads and access tracks and are conducted on an as needs basis. The following management measures will be implemented during operation of the Proposal to minimise impacts to flora and vegetation:

- Maintenance and repair activities will be restricted to existing cleared areas where possible; and
- Access to infrastructure will be through existing access tracks.

6.1.5 Assessment and significance of residual impact

6.1.5.1 Direct impacts

6.1.5.1.1 Loss of vegetation

Vegetation complexes and land systems

The Proposal 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. Therefore, the reduction in the extent of VA 117 as a result of the Proposal is not considered significant at any scale (Table 6-7).

The Proposal will result in the reduction of up to 0.01% of 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 (Table 6-8). the reduction in the extent of the Granitic and/or Littoral Land Systems as a result of the Proposal is not considered significant.

Table 6-7 Impacts to Vegetation Association 117 from the Proposal

Scale	Pre-European extent (ha)	Current extent (ha)	% Remaining	Current extent after clearing for the Proposal	% Remaining
WA	919,517.04	886,005.78	96.35	885,995.78	96.35
Pilbara IBRA bioregion	82,705.78	78,096.64	94.43	78,086.64	94.41
Roebourne subregion	50,962.94	46,901.57	92.03	46,891.57	92.01
City of Karratha	41,173.74	31,921.58	77.53	31,911.58	77.50

Table 6-8 Impacts to Land Systems from the Proposal

System	Pre-European extent (ha)	Current extent (ha)	% Remaining	Current extent after clearing for the Proposal	% Remaining
Granitic	408,456.36	407,221.69	99.70	407,207.29	99.69
Littoral	393,122.85	355,232.73	90.39	355,218.33	90.36

Vegetation types and significant vegetation

Assessment of the local scale impacts has been determined by using the Department of Primary Industries and Regional Development (DPIRD) Native Vegetation Extent data (DPIRD-005) (GoWA 2022) for a 20 km buffer surrounding the Proposal. Within a 20 km buffer (152,981.08 ha) of the Proposal, there is approximately 53,268 ha of native

vegetation. The Proposal will require permanent clearing of up to 14.40 ha of native vegetation (including up to 2.90 ha of temporary clearing), representing an overall 0.03% reduction in the extent of native vegetation within a 20 km radius. The Proposal will reduce the extent of native vegetation within a 20 km radius to approximately 53,253.60 ha. The proposed vegetation clearing is not considered significant within a local and regional context.

Overall, the Proposal will result in the permanent clearing of up to 14.40 ha of native vegetation (including up to 2.90 ha of temporary clearing), representing thirteen VTs. Two VTs, VT03 and EvAbTa (totalling 6.56 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* 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 design is approximately 0.72 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 Proposal is not considered to be significant, nor will the clearing significantly impact the function of these drainage lines.

In addition, three VTs (Tspp, VT04 and VT05, totalling 9.11 ha) are considered to represent locally restricted vegetation associated 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 design is approximately 0.47 ha. Horizon Power will avoid as far as practicable placing access tracks within these VTs, 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 within VT06.

There is 2.07 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 (1.47 ha, 71.0%) being in Very Good condition.

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 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.

Given that the low likelihood of Option 2 being implemented during construction, implementation of the Proposal is not expected to have a significant impact on the Priority 1 'Burrup Peninsula Rock Pile Communities PEC'.

6.1.5.1.2 Loss of significant flora

The Proposal will not impact any Threatened flora taxa listed under the EPBC Act and/or the BC Act. Implementation of the Proposal will result in impacts to two Priority flora species, including:

- Up to six (6) individuals of *Rhynchosia bungarensis* (Priority 4); and
- Up to 19 individuals of *Terminalia supranitifolia* (Priority 3)

Rhynchosia bungarensis (Priority 4)

There are 84 records of *Rhynchosia bungarensis* (Priority 4) reported on FloraBase across WA, with records showing individuals to be occasional to common. The total number of individuals of *R. bungarensis* is estimated to be 236[2].

The Proposal has been designed to minimise impacts to *R. bungarensis* individuals as far as possible. As the design develops, impacts to *R. bungarensis* will be further reduced and avoided where possible. In addition, no-go zones have been developed to minimise impacts to *R. bungarensis* individuals (as detailed in Figure 6-8). 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. 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*.

Terminalia supranitifolia (Priority 3)

There are 54 *FloraBase* records of this species within WA, with sparse records of plants at each location. The total number of individuals of *T. supranitifolia* is estimated to be 223[2].

The Proposal has been designed to minimise impacts to *T. supranitifolia* individuals as far as possible. As the design develops, impacts to *T. supranitifolia* will be further reduced and avoided where possible. In addition, no-go zones have been developed to minimise impacts to *T. supranitifolia* individuals (as detailed in Figure 6-8). 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 Proposal 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

[2] Source: *FloraBase* (WA Herbarium 1998–), VLA (2019) and GHD (2019, 2020a & 2022). *FloraBase* records often provide the count (frequency) in descriptors such as common, occasional and scattered without providing an actual number of plants. For the purposes of this assessment these records have been counted as one individual. As such the estimates are underrepresented with the actual number of individuals expected to be much higher. Therefore, the percent impact calculated is considered to be very conservative.

abundance of records of the species across WA and the likely underrepresentation of individual counts from *FloraBase*.

6.1.5.2 Indirect impacts

6.1.5.2.1 Introduction and/or the spread of weeds

The DE contains and lies adjacent to PECs and other significant vegetation, priority flora and wooded areas of conservation value within the Roebourne Plain that are vulnerable to weed invasion.

Clearing required for the Proposal and increased movement of vehicles, including earth moving machinery may result in the establishment of new populations of weed species. One environmental weed, *Passiflora foetida* (Passionflower), has been recorded within the DE, within a previously disturbed area adjacent to Burrup Road. While only one environmental weed occurs within the DE, an additional four environmental weeds were recorded within the vicinity. There is the potential for weed numbers to increase by the spread of windblown seeds from existing nearby populations, the spread of weed seeds from the movement of soil during earthworks, or weed seeds entering the DE through contaminated vehicles, earthmoving equipment or construction materials.

Weed impacts may be cumulative in response to other impacts to native vegetation, such that they may exacerbate the decline or change in native vegetation composition or disrupt ecological processes.

Vehicle hygiene, weed control and ground disturbance procedures will be implemented for the Proposal. These mitigation measures include, but are not limited to, ensuring that vehicle access is restricted to designated access roads, and the implementation of a weed monitoring program to minimise the spread of existing weed populations. The implementation of these weed hygiene measures will be conducted in line with the CEMP (Appendix 1). The management measures included within the CEMP are expected to reduce the introduction of weeds into new areas, and therefore, the introduction and/or spread of weeds resulting from the Proposal is not expected to be significant.

6.1.5.2.2 Alteration of fire regimes

A change in fire regimes is often associated with increased human activity, leading to degradation of natural ecosystems. Fire is a major determining factor in affecting species composition. It can cause disturbance of vegetation condition but can also be required for regeneration of some species.

Given the size of the Proposal and its location adjacent to existing infrastructure and roads, the Proposal is not considered likely to alter existing fire regimes in the local area. While there is an increased risk of fire during the construction phase, appropriate management measures will be implemented through the CEMP (Appendix 1) to minimise this risk. This will include identifying potential ignition sources and/or activities with the potential to lead to fire, and preventative measures. Weed management and the construction of firebreaks will reduce the risk of fires (if caused by the Proposal) spreading to nearby vegetation. Fire is considered manageable and implementation of the Proposal is unlikely to significantly impact existing fire regimes.

6.1.5.2.3 Alteration to hydrological flows

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 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 Proposal will not be placed within drainage lines, reducing impacts to environmental flows, sedimentation and erosion within the DE. Additional infrastructure required for the Proposal, 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 Proposal 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 Proposal 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 (Appendix 1).

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 to flora and vegetation, including PECs and/or priority flora species.

6.1.5.2.4 Spills or leaks of chemical, hydrocarbon and/or hazardous materials

Spills or leaks of chemicals, hydrocarbons and/or hazardous materials have the potential to impact surrounding vegetation communities. In addition, vegetation within drainage lines is also vulnerable to these impacts.

Only common substances, such as fuel and oil, will be used during construction of the Proposal. There is the potential for waste to be generated during construction, however, this waste will be disposed of at an appropriately licenced landfill facility. Management measures that will be implemented during construction to minimise impacts resulting from spills or leaks of chemical, hydrocarbon and/or hazardous materials are outlined within the CEMP prepared for the Proposal (Appendix 1).

Overall, construction impacts to surrounding vegetation resulting from the spills or leaks of chemical, hydrocarbon and/or hazardous materials are expected to be incidental and/or localised and not expected to result in significant impacts to flora and vegetation, including PECs or priority flora species.

6.1.5.3 Summary of significant residual impacts

Direct and indirect impacts to flora and vegetation associated with the Proposal are not expected to be significant. These impacts can be managed through Horizon Power's mitigation and management measures, and the implementation of the CEMP prepared for the Proposal (Appendix 1).

6.1.6 Environmental outcome

The Proposal is not expected to result in significant residual impacts to flora and vegetation.

The Proposal requires clearing of up to 14.40 ha of native vegetation, including up to 0.05 ha of the Priority 1 'Burrup Peninsula rock pile communities' PEC, up to 2.50 ha of riparian vegetation, and up to 1.50 ha of other significant vegetation. The Proposal also requires the removal of up to six individuals of *Rhynchosia bungarensis* (Priority 4) and up to 19 individuals of *Terminalia supranitifolia* (Priority 3).

Horizon Power considers that the potential direct and indirect impacts to flora and vegetation (with implementation of the avoidance, minimisation and rehabilitation measures proposed) will meet the EPA's objective for flora and vegetation.

Table 6-9 provides a summary of the environmental outcomes of the Proposal relating to flora and vegetation. The clearing extent and impacts to flora and vegetation will be reduced further during the design phase, where possible.

Table 6-9 Flora taxa considered likely or have the potential to occur within the Burrup DE

Factor	Flora and vegetation environmental outcomes
Native vegetation	Permanent clearing of up to 11.50 ha of native vegetation and temporary clearing of up to 2.90 ha of native vegetation.
Vegetation Associations	Permanent clearing of up to 11.50 ha of native vegetation and temporary clearing of up to 2.90 ha of native vegetation within Vegetation Association 117.
Land systems	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.
Riparian vegetation	Clearing of no more than 2.50 ha of riparian vegetation.
Other significant vegetation	Clearing of no more than 1.50 ha of vegetation located within the tidal inlet between Hearson Cove and King Bay.
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 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.
Significant flora	Clearing of no more than: • Six individuals of *Rhynchosia bungarensis* (Priority 4); • 19 individuals of *Terminalia supranitifolia* (Priority 3); and

Factor	Flora and vegetation environmental outcomes
	• No impacts to *Vigna tridiophila* (Priority 3) individuals.
Weeds	No significant introduction or spread of weeds to areas adjacent to the Proposal.
Fire	No significant alteration to fire regimes as a result of the Proposal.
Hydrology	No significant impacts to surrounding vegetation due to alteration to hydrology as a result of the Proposal.
Chemicals, hydrocarbons and hazardous materials	No significant impacts to surrounding vegetation due to chemicals, hydrocarbons and/or hazardous materials spills.

6.2 Environmental Factor – Terrestrial Fauna

The EPA's objective for terrestrial fauna is '*To protect terrestrial fauna so that biological diversity and ecological integrity are maintained*' (EPA 2016e).

6.2.1 Relevant policy and guidance

Table 6-10 below provides consideration of how the relevant EPA policy and guidance, and additional State and Commonwealth guidance, has been applied to the assessment of impacts to terrestrial fauna.

Table 6-10 Policy and guidance for environmental factor terrestrial fauna

Relevant policy and guidance	Explain how the EPA policy and guidance has been considered
Environmental Factor Guideline: Terrestrial Fauna (EPA 2016c).	The Proposal considers the mitigation hierarchy; direct and indirect impacts; implications of cumulative impacts; predicted residual impacts; feasibility of management approaches.
Technical Guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA 2020a).	Surveys and assessments for the Proposal have been undertaken to a standard consistent with the guidance.
Conservation codes for Western Australia Flora and Fauna (DBCA 2019)	Surveys and assessments for the Proposal have identified significant flora and fauna consistent with the WA conservation codes.

6.2.2 Receiving environment

6.2.2.1 Surveys and studies

Horizon Power commissioned several studies to gain an understanding of the terrestrial fauna values within and surrounding the DE. These have included Level 1 and Basic fauna surveys, and desktop assessments undertaken in accordance with relevant EPA guidance.

Terrestrial fauna surveys of the Proposal DE (or portions of the DE) are outlined in Table 6-11, with the extent of survey coverage shown on Figure 6-1. Where survey coverage overlaps, the more recent survey supersedes the results of the previous surveys.

Table 6-11 Summary of flora and vegetation surveys conducted within and surrounding the Proposal

Survey/Report	Details
Horizon Power 124-KRT-DMP 132kV Line Upgrade Project Flora and Fauna Survey (GHD 2019) (Appendix 4)	Scope: Level 1 fauna (reconnaissance) survey, including a desktop assessment and field survey to map fauna habitats and undertake opportunistic searches for fauna. The survey also included selective avifauna surveys and deployment of remote camera traps to target cryptic species. The Level 1 fauna (reconnaissance) survey was completed in accordance with EPA (2016b) *Technical Guide – Terrestrial Fauna Surveys.* Survey Dates: 10 – 14 June 2019.

Survey/Report	Details
	Survey area: The GHD (2019) survey area covered 210.90 ha and included 0.50 ha of the DE.
Horizon Power Burrup Expansion Project Flora and Vegetation Survey (GHD 2020a) (Appendix 5)	Scope: Level 1 flora and vegetation survey, including a desktop assessment and field survey to map vegetation communities and condition, and undertaken targeted searches for Threatened and Priority (P) flora species. The assessment was completed in accordance with *EPA Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016) between 23 – 28 April 2020. Although this survey mapped vegetation types only, fauna habitats have been assigned based on the fauna habitat mapping within the GHD (2022) survey. Survey Dates: 23 – 28 April 2020. Survey area: The GHD (2020a) survey area covered 805.90 ha and included 71.20 ha of the DE.
Woodside Power Pty Ltd Hybrid Renewable Power Plant Fauna Survey (GHD 2020b) (Appendix 7)	Scope: Level 1 fauna survey, including a desktop review and field survey to verify the accuracy of the desktop study, and to characterise the fauna and faunal assemblages present. The Level 1 fauna survey was completed in accordance with EPA (2016b) *Technical Guide – Terrestrial Fauna Surveys* and included identifying and describing the dominant fauna habitat types present and their condition, and assessing habitat connectivity, identifying and recording fauna species. Survey Dates: 10 – 13 June 2019 and 22 – 24 July 2019. Survey area: The GHD (2020b) survey area covered 1,545.20 ha and included 39.70 ha of the DE.
Additional Areas Reconnaissance/Basic Survey (GHD 2022) (Appendix 6)	Scope: Basic fauna survey of the remaining areas within the DE that have not yet been surveyed, including a field survey to verify the dominant fauna habitats of the additional survey areas are consistent with the results of adjacent recent surveys (GHD 2020a, b). The survey methods involved traversing the additional survey areas on foot and making opportunistic recordings and photographic reference points within identified fauna habitats. The survey methodology employed by GHD was undertaken with reference to the EPA *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016) and the EPA Te*chnical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020). Survey Dates: 3 – 4 August 2022. Survey area: The GHD (2022) survey area covered 46.80 ha and covered 14.51 ha of the DE.

6.2.2.2 Fauna habitat

Five fauna habitat types (not including cleared and disturbed areas), have been mapped across 78.26 ha of the 85.61 ha DE (GHD 2019, 2020a, b & 2022). These fauna habitats align with the vegetation types identified in Section 6.1.2.3, 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 in Table 6-12 and shown on Figure 6-10. Disturbed areas cover 0.78 ha of the DE and are considered to be of minimal value to fauna. The remaining 6.57 ha within the DE is cleared and is not considered to provide habitat for fauna species.

Development of the Proposal requires clearing of up to 14.40 ha of native vegetation providing habitat for fauna, of which up to 2.90 ha of temporary clearing will be rehabilitated immediately following construction.

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.

Table 6-12 Fauna habitats recorded within the DE

Fauna habitat types	Fauna habitat value	Extent within the DE (ha)
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.	**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.	9.44 ha
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 debris is present and no logs, branches or hollows are available.	**Moderate to High value** Supportive habitat for species foraging and disbursal particularly the Northern Quoll and Pilbara Olive Python.	10.82 ha

Fauna habitat types	Fauna habitat value	Extent within the DE (ha)
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.	**High value** Linear corridor of habitat 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.	6.53 ha
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.	**High value** Provides habitat for Migratory birds, North-western Free-tailed Bat and Peregrine Falcon	7.88 ha
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.	**High value** • Core habitat for Northern Quoll and Pilbara Olive Python; and • Foraging habitat for the Peregrine Falcon	43.59 ha
Total		**78.26 ha**

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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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GHD

Horizon Power
Burrup Expansion Program

Fauna Habitats Mapped within the DE

Project No. **12582802**
Revision No. **0**
Date **07/11/2022**

FIGURE 6-10
Page 1 of 4

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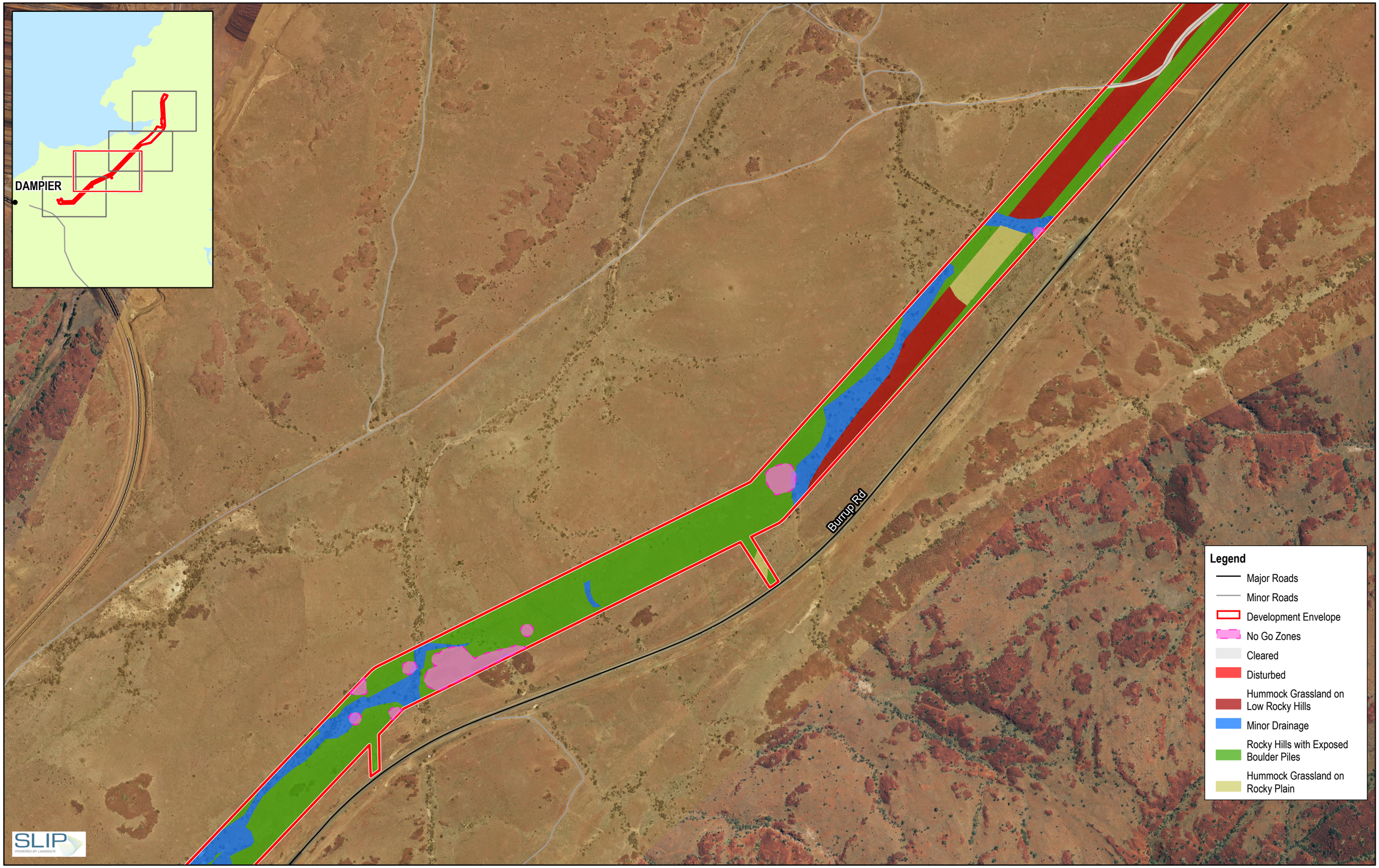

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Horizon Power
Burrup Expansion Program

Fauna Habitats Mapped within the DE

Project No. **12582802**
Revision No. **0**
Date **07/11/2022**

FIGURE 6-10
Page 2 of 4

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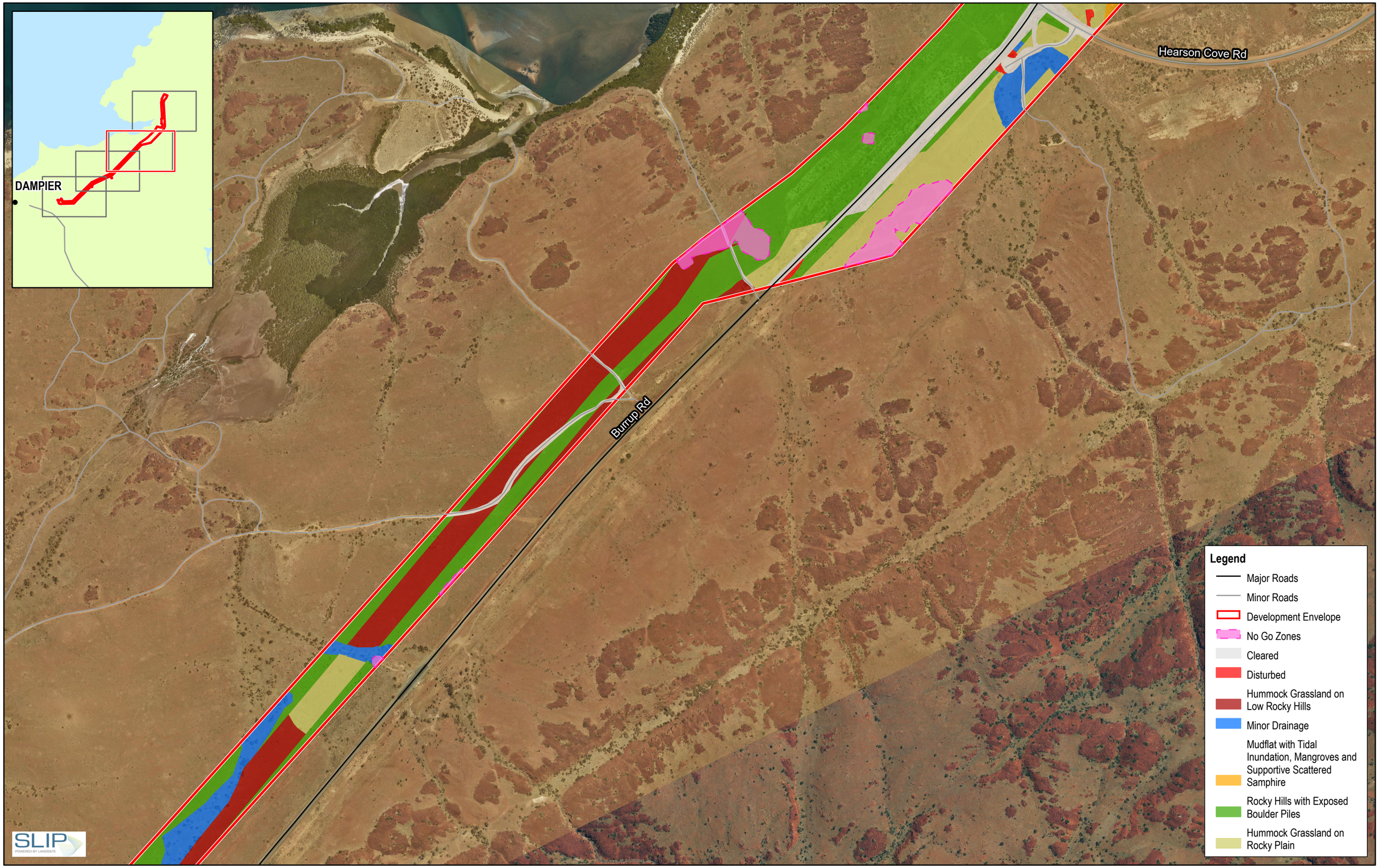

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Horizon Power
Burrup Expansion Program

Fauna Habitats Mapped within the DE

Project No. **12582802**
Revision No. **0**
Date **07/11/2022**

FIGURE 6-10
Page 3 of 4

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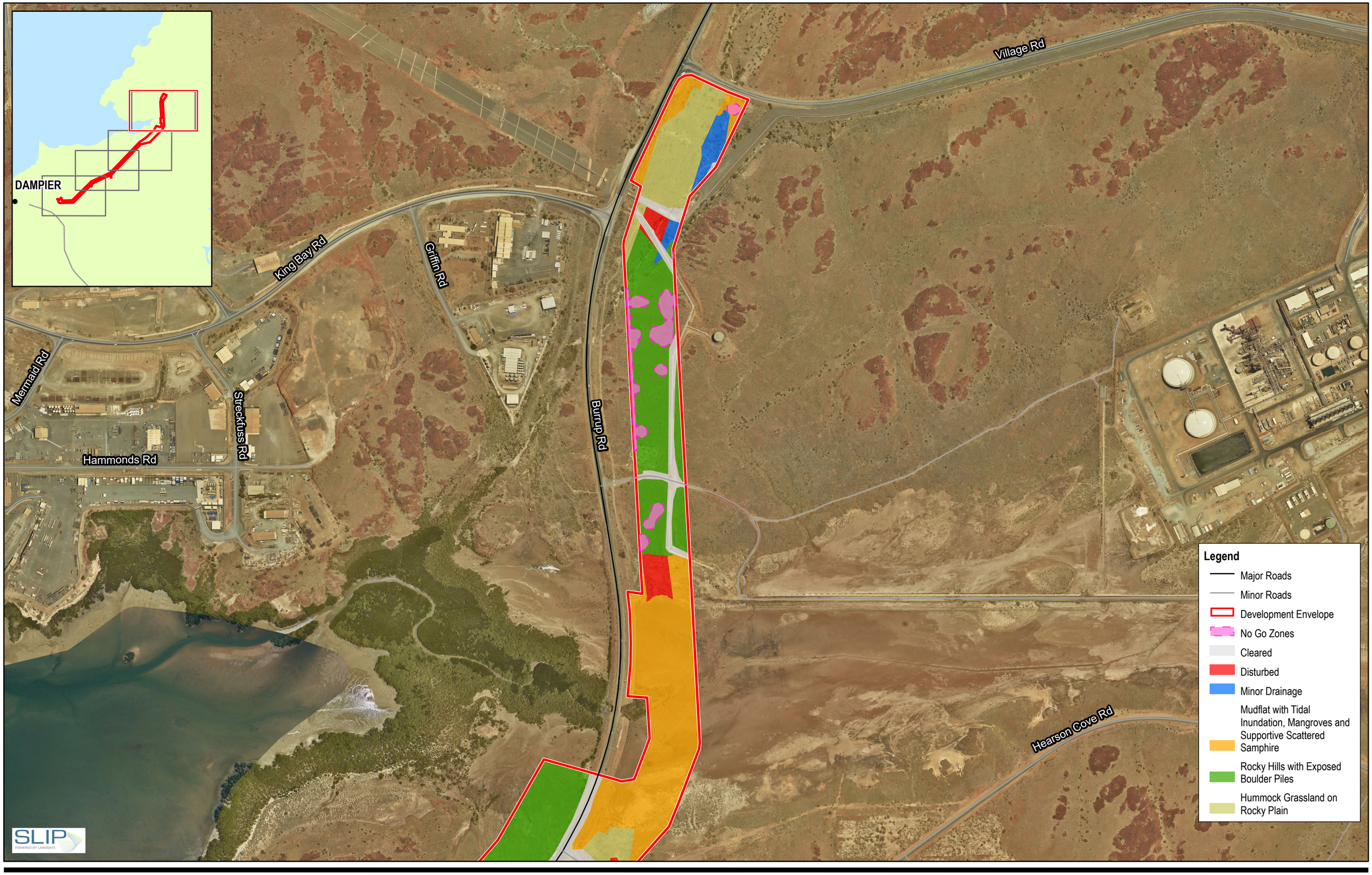

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Horizon Power
Burrup Expansion Program

Fauna Habitats Mapped within the DE

Project No. **12582802**
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Date **07/11/2022**

FIGURE 6-10
Page 4 of 4

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6.2.2.2.1 Habitat linkages

The fauna habitats within the DE are part of a contiguous, largely intact area of remnant vegetation present on the Murujuga (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.

6.2.2.3 Fauna

6.2.2.3.1 Fauna diversity

Across the wider survey areas, a total of 101 fauna species, consisting of 68 birds, 17 reptiles and 16 mammals were recorded (GHD 2019, 2020b). Of these species, four were introduced and comprised dog, cat, cattle and the black rat. The remaining species were all native and are known from the region.

6.2.2.3.2 Significant fauna

Desktop searches completed by GHD (2019) and GHD (2020b) identified the presence/ potential presence of 52 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 (GHD 2019 & 2020b):

- 18 species listed as Threatened under the EPBC Act and/or the BC Act;
- One (1) species listed as Threatened under the EPBC Act and as Priority 3 by DBCA;
- 27 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
- Five (5) 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). Recent surveys have recorded the presence of few active mounds on the Burrup Peninsula and the species is considered locally extinct (Start 1996). Therefore, this species is not discussed further within the Referral Supporting Document.

A likelihood of occurrence assessment (adapted from the GHD [2019 & 2020b] surveys) concluded that an additional fifteen significant fauna species have the potential to occur within the wider survey areas. These species are detailed in Table 6-13.

This likelihood of occurrence assessment was 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 (GHD 2019 & 2020b).

Table 6-13 Significant fauna species considered likely, or have the potential to occur within the DE

Fauna species	EPBC Act	BC Act/DBCA status	Likelihood of occurrence
Gull-billed Tern (*Gelochelidon nilotica*)	Migratory	Protected under International Agreement	**Recorded** Species recorded within the wider GHD (2020b) survey area.
Caspian Tern (*Hydroprogne caspia*)	Migratory	Protected under International Agreement	**Recorded** Species recorded within the wider GHD (2020b) survey area.
Crested Tern (*Thalasseus bergii*)	Migratory	Protected under International Agreement	**Recorded** Species recorded within the wider GHD (2020b) survey area.
Northern Quoll (*Dasyurus hallucatus*)	Endangered	Endangered	**Likely** Species is known from the Burrup Peninsula and habitat is present.
Pilbara Olive Python (*Liasis olivaceus barroni*)	Vulnerable	Vulnerable	**Likely** Resident/regular visitor, opportunistic use in/to the DE.
Peregrine Falcon (*Falco peregrinus*)	-	Other Specially Protected Fauna	**Likely** Regular visitor or resident to DE.
Northern Short-tailed Mouse (*Leggadina lakedownensis*)	-	Priority 4	**Likely** Resident to DE, restricted to the cracking clays and minor drainage lines.
Lined Soil-crevice Skink (*Notoscincus butleri*)	-	Priority 4	**Likely** Resident in/to the DE.
Bridled Tern (*Onychoprion anaethetus*)	Migratory	Protected under International Agreement	**Likely** Regular visitor or resident to DE.

Fauna species	EPBC Act	BC Act/DBCA status	Likelihood of occurrence
Wood Sandpiper (*Tringa glareola*)	Migratory	Protected under International Agreement	**Likely** Seasonal visitor, opportunistic use in/to the DE.
Common Greenshank (*Tringa nebularia*)	Migratory	Protected under International Agreement	**Likely** Seasonal visitor, opportunistic use in/to the DE.
Oriental Pratincole (*Glareola maldivarum*)	Migratory	Protected under International Agreement	**Likely** Seasonal visitor, opportunistic use in/to the DE.
Oriental Plover (*Charadrius veredus*)	Migratory	Protected under International Agreement	**Likely** Seasonal visitor, opportunistic use in/to the DE.
Common Sandpiper (*Actitis hypoleucos*)	Migratory	Protected under International Agreement	**Likely** Seasonal visitor, opportunistic use in/to the DE.
Osprey (*Pandion haliaetus*)	Migratory	Migratory	**Likely** This species is likely to fly over, and opportunistically utilise portions of the habitat.

North-western Free-tail Bat (Mormopterus (Ozimops) cobourgianus)

The North-western Free-tail Bat is listed as Priority 1 by the DBCA. The species is known from 12 locations in WA (DBCA 2007) and four (4) locations in the Northern Territory. In WA, this species inhabits mangrove stands, and has been recorded roosting in hollows and or crevices in mangroves (Van Dyck et al. 2013).

The North-western Free-tail Bat was recorded indirectly within the wider GHD (2020b) survey area from calls of the species. Given the lack of mangrove habitats within the DE, it is likely this species opportunistically forages in the DE and roosts in the mangroves to the west (in King Bay), or to the east in the northern portion of Hearson Cove.

There is 7.88 ha of suitable foraging habitat for the North-western Free-tail bat within the DE, comprising the 'Mudflat with Tidal Inundation, Mangroves and Supportive Scattered Samphire' habitat type.

Northern Quoll (Dasyurus hallucatus)

The Northern Quoll was not recorded during the GHD (2019, 2020b & 2022) surveys, however, the species is known to occur in the area in low numbers. The Northern Quoll is considered to be restricted to the Burrup Peninsula and is not considered common.

The preferred habitat for the species consists of the 'Hummock Grassland on Low Rocky Hills', 'Minor Drainage' and the 'Rocky Hills with Exposed Boulder Piles' habitat types. There is a total of 60.94 ha of suitable habitat for the Northern Quoll within the DE.

Pilbara Olive Python (Liasis olivaceus barroni)

The Pilbara Olive Python was not recorded during the GHD (2019, 2020b & 2022) surveys, however suitable habitat is present within the DE. The 'Rocky Hills with Exposed Boulder Piles' and associated 'Minor Drainage' habitats would be regarded as important habitat for the species. The remainder of the habitat in the DE is supportive only and the 'Hummock Grassland on Rocky Plain' habitat type is not considered habitat for Pilbara Olive Python.

There is 52.12 ha of important habitat for the Pilbara Olive Python within the DE and 18.70 ha of supporting habitat.

Peregrine Falcon (Falco peregrinus)

The Peregrine Falcon was not recorded during the GHD (2019, 2020b & 2022) surveys, however, the species inhabits a range of habitats and suitable hunting habitat is present within the DE. There is limited breeding habitat present for the species within the DE.

There is 67.44 ha of suitable habitat for the Peregrine Falcon within the DE, comprising the 'Rocky Hills with Exposed Boulder Piles', 'Mudflat with Tidal Inundation', 'Mangroves and Supportive Scattered Samphire', 'Minor Drainage and Hummock Grassland on Rocky Plain' habitat types.

Northern Short-tailed Mouse (Leggadina lakedownensis)

The Northern Short-tailed Mouse was not recorded during the GHD (2019, 2020b & 2022) surveys, however, suitable habitat is present within the DE. Within the DE, there is a total of 6.53 ha of suitable habitat for the Northern Short-tailed Mouse, comprising the 'Minor Drainage' line habitat type.

Lined Soil-crevice Skink (Notoscincus butleri)

The Lined Soil-crevice Skink was not recorded during the GHD (2019, 2020b & 2022) surveys, however, suitable habitat is present within the DE. Within the DE, there is a total of 6.53 ha of suitable habitat for the Lined Soil-crevice Skink, comprising the 'Minor Drainage' line habitat type.

Migratory birds

One Migratory bird species, the Whimbrel (*Numenius phaeopus*), was recorded within the GHD (2020b) wider survey area, foraging in an intertidal drainage line outside of the DE. An additional eleven migratory species have the potential to occur within the DE, due to the presence of suitable habitat (Table 6-13).

Migratory species are likely to fly over the DE as they move between King Bay and Hearson Cove, with this flight path likely being a regular fly over for these species. Migratory species that have the potential to occur within the DE however, are unlikely to rely on the habitats available. There is 7.88 ha of suitable habitat for Migratory birds within the DE, comprising the 'Mudflat with Tidal Inundation, Mangroves and Supportive Scattered Samphire' habitat type.

6.2.2.3.3 Short-range endemic fauna

The 'Burrup Peninsula rock pile communities' PEC (Priority 1) is associated with the presence of Short-Range Endemic (SRE) land snails. The total extent of the 'Burrup Peninsula rock pile communities' PEC within the DE is 2.07 ha.

Based on Horizon Power's commitment to avoid or otherwise minimise impact to the Burrup Peninsula rock pile communities' PEC when constructing the Proposal, any impact to SRE land snails (if present) would be minor (maximum impact of 0.05 ha) (GHD 2020b).

6.2.3 Potential impacts

6.2.3.1 Direct impacts

Construction of the Proposal will result in the direct loss of fauna habitat, including habitat suitable for significant fauna species, through clearing. Operation of the Proposal will not directly impact terrestrial fauna as maintenance activities will utilise the existing roads and access tracks, hence impacts to fauna habitats will be short-term and partially recoverable.

Direct impacts to terrestrial fauna during construction of the Proposal includes:

- Clearing 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 five fauna habitats provide breeding and/or foraging value to:
    - Two significant fauna species recorded within DE during the GHD (2020b) survey:
        - North-western Free-tail Bat (*Mormopterus* (*Ozimops*) *cobourgianus*); and
        - Whimbrel (*Numenius phaeopus*)
    - An additional fifteen species (11 birds, 2 mammals, 2 reptiles) considered to have the potential to occur within the DE based on presence of suitable habitats.
- Clearing of up to 0.05 ha of the Priority 1 Burrup Peninsula rock pile communities PEC in the unlikely event that construction of the Proposal is constrained by Aboriginal cultural heritage within the northern quarter of the DE (i.e. an unexpected find during initial ground disturbing works).

6.2.3.2 Indirect impacts

Construction and operation of the Proposal may result in the following indirect impacts to terrestrial fauna:

- Fauna injury/death from vehicle strike/clearing activities; and
- Fauna activity disturbance from temporary increase in noise/vibration/light during construction.

6.2.3.3 Cumulative impacts

Impacts to aspects of Terrestrial Fauna in proximity to the Proposal were identified through the collation of information from clearing permits and planning schemes and environmental referrals for other Proposals (Table 6-14). Proposals used to inform cumulative impacts to flora and vegetation include the Yara Ammonia Plant (and Renewable Hydrogen Project)

and the Perdaman Urea Project (refer to Section 9.1 for an overview of the CIA methodology).

Table 6-14 Cumulative impacts to terrestrial fauna from other Proposals

Aspect / Project	Burrup Common User Transmission Infrastructure Current Proposal	Yara Ammonia Plant and Renewable Hydrogen Project	Perdaman Urea Project	North West Shelf Project Extension	Pluto North West Shelf Interconnector Pipeline	Native Vegetation Clearing Permits	Cumulative impact
Proponent	Horizon Power	Yara Pilbara Fertilisers Pty Ltd	Perdaman Chemical and Fertilisers Pty Ltd	Woodside Energy Ltd	AGI Operations Pty Ltd	Multiple	N/A
Proposed Project commencement	2023	2021	2020 - 2023	N/A – currently operational under existing Ministerial Statement 536 – Karratha Gas Plant	2022	N/A	N/A
Description	Development of a 132 kV overhead transmission line between the Dampier Substation and the proposed Burrup Substation (the Proposal).	Development of a Renewable Hydrogen Plant and associated infrastructure, including a dedicated solar photovoltaic (PV) farm, electrolyser and its balance of plant, and supporting infrastructure, including site tracks.	Construction and operation of a urea plant with a production capacity of approximately 2 million tonnes per annum (Mtpa) within the Burrup Strategic Industrial Area (BSIA) on the Burrup Peninsula.	Continued and extension of the operating life of the NWS Project (MS 536).	Design and construction of an interconnector pipeline, connecting the Pluto Interconnector Compressor to the Pluto LNG Plant.	Approved Native Vegetation Clearing Permits	N/A

Location	City of Karratha, WA Located in the Murujuga (Burrup Peninsula), approximately 1.5 km east of the Dampier township in the Pilbara region.	City of Karratha, WA Located in the Murujuga (Burrup Peninsula), approximately 11 km north-west of Karratha in the Pilbara region of the north-west of WA.	City of Karratha, WA Located approximately 8 km north-east of Dampier and 20 km north-west of Karratha (in the Murujuga (Burrup Peninsula)).	City of Karratha, WA Located approximately 8 km north-east of Dampier and 20 km north-west of Karratha (in the Murujuga (Burrup Peninsula)).	City of Karratha, WA Located approximately 8 km north-east of Dampier and 20 km north-west of Karratha (in the Murujuga (Burrup Peninsula)).	Within 10 km of the current Proposal.	N/A
Proposed fauna habitat clearing	14.40 ha of fauna habitat in varying condition.	23.09 ha of fauna habitat in varying condition.	6.40 ha of fauna habitat in varying condition.	No additional clearing of fauna habitat.	10.69 ha of fauna habitat in varying condition.	1,350.80 ha* of fauna habitat in varying condition.	Clearing of approximately 1,405.38 ha of fauna habitat in varying condition (including 1,350.80 ha associated with approved

Significant fauna species and habitats affected	• Two significant fauna species (Northern Quoll and Pilbara Olive Python) recorded within the DE;
	• Four fauna habitats affected:
	  ○ Grasslands;
	  ○ Minor drainage;
	  ○ Floodplain; and
	  ○ Rocky outcrop
	• An additional 15 species with the potential to occur within the DE.
		• Eight significant fauna species (Pilbara Olive Python, Western Pebble-mound Mouse, North-western Free-tail bat, Caspian Tern, Gull-billed Tern, Common Sandpiper, Common Greenshank and Red-necked Stint) recorded within the wider survey area;
		• Five fauna habitats affected:
		  ○ Foothills habitat;
		  ○ Minor drainage lines;
		  ○ Floodplain;
		  ○ Sand plain; and
		  ○ Waterbody habitat
		• An additional 23 species with the potential to occur within the DE.
			• Five significant fauna species (Red Knot, Northern Quoll, Pilbara Olive Python, Ghost Bat, North-western Free-tail bat and Peregrine Falcon) may be present in wider survey area;
			• Four fauna habitats affected:
			  ○ Rocky outcrops;
			  ○ Grasslands;
			  ○ Shrubland; and
			  ○ Drainage lines
			• No impact to the Priority 1 Ecological Community Rockpools of the Burrup Peninsula (significant habitat for SRE species); and
			• An additional 23 species with the potential to occur within the DE.
				NA	• Two significant fauna species (Northern Quoll and Pilbara Olive Python) with potential to occur;
					• Three fauna habitats affected:
					  ○ Grasslands;
					  ○ Open Woodland/Shrubland; and
					  ○ Eucalypt Woodland.
						N/A	• Up to 23 significant fauna species impacted;
							• Potential impact to up to 8 habitat types; and
							• No impacts to SRE species.

*The clearing number (1,350.80 ha) is attributed to Native Vegetation Clearing Permits within 10 km of the Proposal DE (mainland areas included)

6.2.4 Mitigation

6.2.4.1 Construction

The Proposal has been designed to avoid and/or mitigate impacts to terrestrial fauna where possible. During the design phase, particular focus has been, and will be, placed on reducing the amount of fauna habitat clearing required for construction. Operation of the Proposal will utilise existing roads and access tracks.

Avoidance measures considered and incorporated into Proposal planning to date include:

- Pole placement and span has been designed to avoid impacts to fauna habitat (including PECs and the clearing of high-quality habitat);
- Clearing for unsealed access tracks has been reduced to a trafficable width of approximately 4 m;
- Unless required to avoid impact to Aboriginal cultural heritage, no disturbance will be permitted within PECs;
- No-go zones have been developed to avoid impacts to fauna habitat (including PECs and the clearing of high-quality habitat); and
- Presence of a fauna spotter / catcher during clearing activities to supervise avoidance, dispersal and relocation of any fauna.

As discussed in Section 6.1.4.1, the DE contains a number of recently cleared access tracks which were mapped as vegetated during the biological surveys (Plate 1 and Plate 2). These access tracks will be utilised during construction of the Proposal where possible, to avoid and reduce the amount of fauna habitat clearing required. Where use of these tracks requires clearing of native vegetation these new clearing amounts will be included in total clearing amounts discussed in this document.

Impacts to terrestrial fauna will be minimised and reduced through the following mitigation measures:

- Clearing impacts will be further reduced where possible through the detailed design process, including the positioning of access tracks, poles and pole pads to minimise impacts to fauna habitat (including PECs and high-quality habitat);
- Clearing will be timed to minimise impacts to native fauna;
- Any clearing required of a temporary nature will be rehabilitated upon completion of construction;
- 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 fauna habitat within this area;
- Poles have been positioned within the proposed Burrup Road realignment (to be implemented by Main Roads), reducing the amount of fauna habitat clearing required for access tracks;
- Dust, noise, vibration and light management measures will be implemented during construction; and
- Implementation of the management measures in the Construction Environment Management Plan (CEMP) (Appendix 1) to minimise risks to terrestrial fauna, and to provide monitoring during construction.

6.2.4.2 Operation

Operational activities associated with the Proposal include maintenance inspections and repairs. Operation of the Proposal will utilise existing roads and access tracks and are conducted on an as needs basis. The following management measures will be implemented during operation of the Proposal to minimise impacts to terrestrial fauna:

- Maintenance and repair activities will be restricted to existing cleared areas where possible; and
- Access to infrastructure will be through existing access tracks.

6.2.5 Assessment and significance of residual impact

6.2.5.1 Direct impacts

6.2.5.1.1 Habitat loss

The Proposal will result in the loss of 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 habitats present comprise a mixture of rocky hills, grasslands, drainage lines and mudflats, and provides habitat for various significant fauna species that have the potential to occur within the DE.

Of the 78.26 ha of fauna habitat to be cleared, 9.44 ha is 'Hummock Grassland on Rocky Plain', 10.82 ha is 'Hummock Grassland on Low Rocky Hills', 6.53 ha is 'Minor Drainage', 7.88 ha is 'Mudflat with Tidal Inundation, Mangroves and Supportive Scattered Samphire' and 43.59 ha is 'Rocky Hills with Exposed Boulder Piles' habitat.

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 also considered core habitat for the Northern Quoll and the Pilbara Olive Python. The Proposal will avoid impacts to the rock piles as far as possible (refer to Section 6.1.5.1.1 for avoidance).

The 'Minor Drainage' and 'Mudflat with Tidal Inundation, Mangroves and Supportive Scattered Samphire' 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). As identified in Section 6.1.5.1.1, the Proposal 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. On this basis the 'Rocky Hills with Exposed Boulder Piles' habitat will continue to be well represented outside the DE.

The design of the Proposal 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 substantial impact fauna habitat.

6.2.5.2 Indirect impacts

6.2.5.2.1 Fauna injury/death from vehicle strike/clearing activities

Construction of the Proposal and associated infrastructure will result in an increase in vehicle movements to and from the DE. Maintenance inspections of the Proposal during

operation may also increase vehicle movements, however vehicles will be restricted to the cleared access tracks.

Construction activities will be undertaken in accordance with measures identified in the CEMP (Appendix 1), such a requirement for fauna spotters to be on site during ground disturbing activities.

The ongoing implementation driving to conditions to prevent the likelihood of fauna road deaths, and minimising driving at dusk and dawn will reduce the risk of fauna injury/death from vehicle strike during construction and operational activities. It is unlikely that any isolated deaths of individuals will affect the conservation status and distribution of any fauna species.

6.2.5.2.2 Fauna activity disturbance from temporary increase in noise/vibration during construction

During construction, there will be noise and vibration emissions due to vehicles movements, as well as from operation of equipment and machinery associated with construction activity. Noise and vibration impacts during construction will be managed in accordance with the CEMP (Appendix 1).

Noise and vibration associated with construction of the Proposal have the potential to result in short-term disturbance to fauna on a local scale. It is unlikely that maintenance inspections during operation of the Proposal will increase the potential for noise and vibration, given the existing presence of Burrup Road. The Proposal is unlikely to result in significant impacts on terrestrial fauna from noise and vibration.

6.2.5.3 Summary of significant residual impacts

Direct and indirect impacts to terrestrial fauna associated with the Proposal are not expected to be significant. These impacts can be managed through Horizon Power's mitigation and management measures, and the implementation of the CEMP prepared for the Proposal (Appendix 1).

6.2.6 Environmental outcomes

The Proposal is not expected to result in significant residual impacts to terrestrial fauna.

The Proposal requires the permanent clearing 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 Proposal will require the removal of habitat that potentially provides breeding and or foraging value to significant fauna species, however this impact is not expected to be significant. Further refinement of the design of the Proposal will seek to minimise impacts to rock piles, drainage and mudflat fauna habitats.

Horizon Power considers that the potential direct and indirect impacts to terrestrial fauna (with implementation of the avoidance, minimisation and rehabilitation measures proposed) will meet the EPA's objective for terrestrial fauna.

Table 6-15 provides a summary of the environmental outcomes of the Proposal relating to terrestrial fauna. The clearing extent and impacts to fauna and fauna habitats will be reduced further during the design phase, where possible.

Table 6-15 Flora taxa considered likely or have the potential to occur within the Burrup DE

Factor	Flora and vegetation environmental outcomes
Fauna habitat	Permanent clearing of up to 11.50 ha of fauna habitat and temporary clearing of up to 2.90 ha fauna habitat potentially suitable for 17 significant fauna species (12 birds, 3 mammals, 2 reptiles).
Fauna injury/mortality	No fauna injuries or mortalities as a result of the Proposal is expected.
Disturbance to fauna	No significant disturbance to fauna as a result of noise and/or vibration arising from the Proposal

6.3 Environmental Factor – Social Surroundings

The EPA's objective for social surroundings is '*To protect social surroundings from significant harm'* (EPA 2016)

6.3.1 Relevant policy and guidance

Table 6-16 below provides consideration of how the relevant EPA policy and guidance, and additional State and Commonwealth guidance, has been applied to the assessment of impacts to social surroundings.

The EP Act defines social surroundings as the '*aesthetic, cultural, economic and social surroundings [of humans] to the extent that those surroundings directly affect or are affected by [people's] physical or biological surroundings*'.

Table 6-16 Policy and guidance

Policy and guidance	Explain how the EPA policy and guidance has been considered
Environmental Factor Guideline – Social Surroundings (EPA 2016)	The Proposal considers the mitigation hierarchy; direct and indirect impacts; implications of cumulative impacts; predicted residual impacts; feasibility of management approaches.
Guidance for the Assessment of Environmental Factors, Assessment of Aboriginal Heritage No. 41 (EPA 2004)	The Proposal provides sufficient information regarding Aboriginal cultural heritage to ensure the EPA can formally assess the Proposal.
Aboriginal Heritage Due Diligence Guidelines (Version 3.0) (Department of Aboriginal Affairs and Department of the Premier and Cabinet 2013)	The Proposal has been designed to avoid impacts to known heritage sites. The assessment applies the precautionary approach to assess the risk to Aboriginal cultural heritage.
Murujuga National Park Management Plan No. 78 (DEC 2013)	The Proposal has implemented measures to reduce direct and indirect impacts to the Murujuga National Park.
The Western Australian Planning Commission State Planning Policy No. 2 – Environment and Natural Resource Policy for Western Australia (WAPC 2003)	The Proposal has, and will, consider sustainability during implementation and construction.
The Western Australian Planning Commission Pilbara Planning and Infrastructure Framework (WAPC 2012)	The Proposal is consistent with the Pilbara Planning and Infrastructure Development Framework.

6.3.2 Receiving environment

6.3.2.1 Surveys and studies

Horizon Power has commissioned Aboriginal cultural heritage surveys (archaeological and ethnographic) of the DE to confirm Aboriginal cultural heritage values. As the DE and footprint has evolved, supplemental surveys have been necessary, with the most recent surveys completed in September 2022. The surveys together cover the entire DE extent.

All surveys were carried out with the support and consent of relevant Traditional Owners. Table 6-17 provides a summary of Aboriginal cultural heritage surveys conducted to support this referral. The full survey reports will not be included with the referral at the request of the Traditional Owners, these can be provided in confidence to the EPA on request, subject to the relevant consent.

Table 6-17 Summary of Aboriginal heritage surveys conducted within and surrounding the Proposal DE

Survey/Report	Details
Report on an Aboriginal Archaeological Survey for Horizon Power's Karratha to Dampier 132 kV Transmission Line Survey, Pilbara, Western Australia (Archae-aus Pty Ltd [Archae-aus] on behalf of the NAC 2019)	Scope: Archaeological survey of the Karratha to Dampier 132 kV transmission line upgrade corridor, including series of parallel pedestrian transects with archaeologists and Ngarluma Traditional Owners spaced approximately 15 m apart. Team members visually inspected the terrain for archaeological material, the locations of which were recorded using a hand-held GPS unit. Survey dates: 18 – 24 February 2019 Survey relevance: The Archae-aus (2019) survey covered 210.90 ha, which included 2.20 ha of the DE. Survey team: Ngarluma Traditional Owners (three people), Archar-aus Consultants (two people)
A Report on an Ethnographic Site Avoidance Aboriginal Heritage Survey of Proposed Powerline Corridor for Horizon Power in the City of Karratha, Western Australia' (Brad Goode & Associates Pty Ltd [BGA] 2019)	Scope: Ethnographic site avoidance survey of the Karratha to Dampier 132kV transmission line upgrade corridor. The ethnographic survey team met with the archaeological survey team (Archae-aus) on several occasions in the field to discuss, review, and assess potential ethnographic significance associated with the archaeological findings. Survey dates: 22-23 February 2019 Survey relevance: The BGA (2019) survey covered 210.90 ha, which included 2.20 ha of the DE. Survey team: Ngarluma Traditional Owners (four people), BGA Consultant (1 person).
Horizon Power Burrup Peninsula Transmission Line Archaeological & Ethnographic Survey, Burrup Peninsula, WA – Report (CBG Solutions [CBG] 2020)	Scope: Archaeological and ethnographic survey of the Burrup Peninsula transmission line corridor, including fieldwork and detailed background research to identify and delineate Aboriginal heritage sites within or adjacent to the survey area. Each work area and any associated access track was surveyed for archaeological material, and once this was completed discussions were held regarding the ethnographic significance about the work area and the landscape in general. Any Aboriginal cultural heritage site recorded during the survey was mapped using a handheld GPS unit. To demarcate the boundary, transects were walked back and forth the site and waypoints recorded where Aboriginal cultural features were no longer present. Survey dates: 6 - 15 July 2020. Survey relevance: The CBG (2020) survey covered 110.20 ha, which included 69.10 ha of the DE. Survey team: MAC Consultants (five people), CBG Consultants (two people)

Survey/Report	Details
Advice of an Archaeological Survey, Horizon Power Burrup Transmission Line Project (Scarp archaeology [Scarp] on behalf of the MAC 2022)	Scope: Archaeological survey of areas within the transmission line corridor (0.25 m^2 area within the King Bay Area, TR 7005461). The survey areas fall within the Burrup Strategic Industrial Area (BSIA) administered under the Burrup and Maitland Industrial Estates Agreement (BMIEA). Survey dates: 31 August – 02 September 2022 Survey relevance: The Scarp (2022) survey covers areas within the DE not previously covered by the Archae-aus 2019 and CBG 2020 surveys Survey team: Scarp Archaeology Consultants (two people), MAC representatives (four people representing Ngarluma, Yindjibarndi, and Marthudunera).
Ethnographic Cultural Heritage Assessment: Advice. Site Avoidance Survey of Horizon Power's Burrup Transmission Line Project (Acacia Cultural Heritage Consulting [Acacia] on behalf of the MAC 2022)	Scope: Ethnographic survey of areas within the transmission line corridor (six polygons within the King Bay Area). The assessed area lies entirely within country managed and protected by MAC and the five traditional Aboriginal groups it represents: the Ngarluma, the Marthudunera, the Yaburara, the Yindjibarndi and the Wong-Goo-Tt-Oo. The assessment was conducted in accordance with the BMIEA. Survey dates: 02 September 2022 Survey relevance: The Acacia (2022) survey covers areas not previously surveyed within the DE (including the King Bay Area and access roads) Survey team: Acacia Consultant (one person), Murujunga Traditional Owners (six people)

6.3.2.2 Economic and social surroundings

The Proposal lies within the City of Karratha Local Government Authority (LGA). The local economy has a strong resource base including major gas, petrochemical and iron ore industries. Prior to the 1960's the region was primarily subject to pastoral and pearling activities (Shire of Roebourne 2007). Prior to European occupation, Ngarluma people occupied this area, presumably dating back to the earliest phases of occupation in the Pilbara around 50,000 years ago.

The Proposal is located within the Burrup SIA. Under the City of Karratha Town Planning Scheme No.8 the SIA is zoned 'Strategic Industry'. The majority of the DE is zoned Strategic Industry (88.00 ha, 85.3%). The remainder of the DE (15.20 ha, 14.7%) is zoned as District Roads (Figure 2-3) (GoWA 2022).

Target industries for the Burrup SIA include liquified natural gas (LNG), domestic gas, processing, ammonia, urea, methanol, gas to liquids and other downstream gas processing or strategic industries (Development WA 2021). The Department of Jobs, Tourism, Science and Innovation (JTSI) is the lead agency for the development of the Burrup SIA and DevelopmentWA is the estate manager.

Existing operational industries on the Burrup include:

- Woodside Energy Ltd – Karratha Gas Plant;
- Woodside Energy Ltd – Pluto LNG Development;
- Yara Pilbara Fertilisers Pty Ltd – Liquid Ammonia Plant; and
- Yara Pilbara Nitrates Pty Ltd – Technical Ammonium Nitrate Production Facility

Approved (but not yet constructed) industries on the Burrup include:

- Perdaman Chemicals and Fertilisers Pty Ltd – Perdaman Urea Project; and
- Yara Pilbara Fertilisers Pty Ltd – Renewable Hydrogen Project.

Whilst the Proposal is located on land zoned for industrial development and roads, it is noted that adjacent areas are recognised for natural and cultural heritage value. The *Burrup Peninsula Land Use Plan and Management Strategy* (Burrup Peninsula Management Advisory Board, 1996) provides management objectives for industry, conservation, heritage and recreation on the Burrup, and outlines acceptable uses and development considerations. A portion of the DE falls within 'Burrup West Policy Area C' which has two objectives 'to use the land for industries requiring adjacent port facilities' and 'to preserve, as far as possible, the environmental values and significant Aboriginal sites'.

6.3.2.3 Amenity

6.3.2.3.1 Visual amenity

The Proposal includes the establishment of a 132 kV overhead transmission line (Plate 3) which will be visible from Burrup Road and Dampier Highway. The height of the poles is anticipated to be approximately 20 m to 28 m. The transmission line is unlikely to be visible from residential areas of Dampier. The current Proposal DE has been positioned to align with existing services (i.e. water, roads) to minimise the extent of visual amenity impacts.

As described in Section 6.3.2.2 the Burrup SIA has been established on the Burrup Peninsula to provide land for downstream processing of local resources (such as LNG). It is noted that adjacent areas are recognised for natural and cultural heritage value, namely the Dampier Archipelago (including the Burrup Peninsula) National Heritage Place and Murujuga National Park. There are also a number of local attractions on the Burrup Peninsula, such as Hearson Cove, which have recreational value to the local community and visitors.

Due to the nature of the infrastructure proposed (which is consistent with existing transmission infrastructure in the region), the Proposal's position within the Burrup SIA, and Horizon's commitment to use (where possible) existing cleared areas; the Proposal is not expected to cause significant aesthetic impacts.

Plate 3 Existing 132kV transmission line entering Dampier substation

6.3.2.3.2 Noise

The Proposal is located north-east of Dampier within the Burrup SIA and the DE is positioned within and adjacent to the Burrup Road corridor. Construction of the Proposal will generate noise of short-term duration` that is unlikely to significantly impact residents of Dampier given the separation distance (minimum 1.5km to the west) between residential areas and the DE. Further ambient noise levels in the Burrup SIA are expected to be higher than baseline due to the nature of both existing and proposed activities. The Proposal is not expected to significantly contribute to noise levels within the Burrup SIA.

6.3.2.4 Cultural heritage

6.3.2.4.1 Dampier Archipelago (including Burrup Peninsula) National Heritage Place

Portions of the DE intersect National Heritage Place 'Dampier Archipelago (including Burrup Peninsula)' (Dampier Archipelago) (Figure 6-11). The Dampier Archipelago was listed as a National Heritage Place on 3 July 2007, and has been nominated for World Heritage listing.

The Dampier Archipelago, located on the Indian Ocean coast of the west Pilbara in WA, 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^2. 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

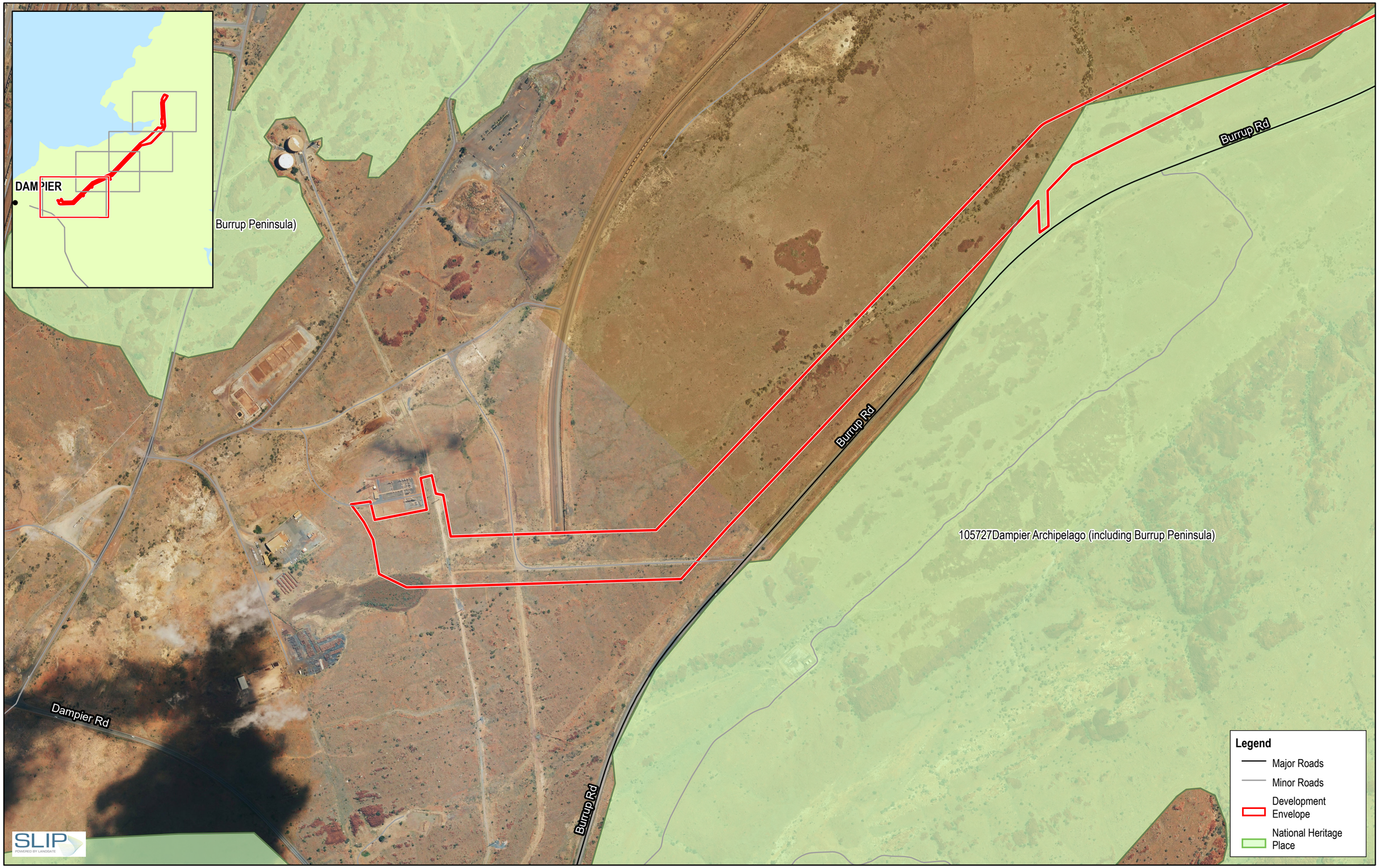
arrangements, and the importance of these within the Aboriginal traditions of Ngarda-Ngarli people. The rock art of the Dampier Archipelago illustrates the evolution of societies, cultures and the environment over time (DCCEEW 2022).

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).

6.3.2.4.2 Murujuga World Heritage nomination

MAC is working in partnership with the WA Government to prepare a World Heritage nomination for the Dampier Archipelago National Heritage area, in collaboration with the Australian Government and stakeholders. The World Heritage nomination area initially encompasses the area covered by the Dampier Archipelago National Heritage area (Figure 6-11). The area is being nominated due to its outstanding Aboriginal cultural value, which includes over one million petroglyphs (rock art) showing human images, extinct animal species such as megafauna and Thylacines (Tasmanian tiger), as well as existing avian, marine and land animals. The area also features middens, fish traps, rock shelters, ceremonial places, and stone arrangements.

This nomination is expected to be submitted by February 2023, with the earliest acceptance onto the World Heritage list being mid-2024. Acceptance onto the World Heritage list is not guaranteed; however the WA government has been progressing this nomination for a number of years and intends to continue pursuing this direction. Although not a current constraint on the Proposal, this World heritage nomination has been considered during the design of the Proposal, with the Proposal being designed to avoid impacts to known heritage values.



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

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GHD

Horizon Power
Burrup Expansion Program

National Heritage

Project No. **12582802**
Revision No. **0**
Date **07/11/2022**

FIGURE 6-11
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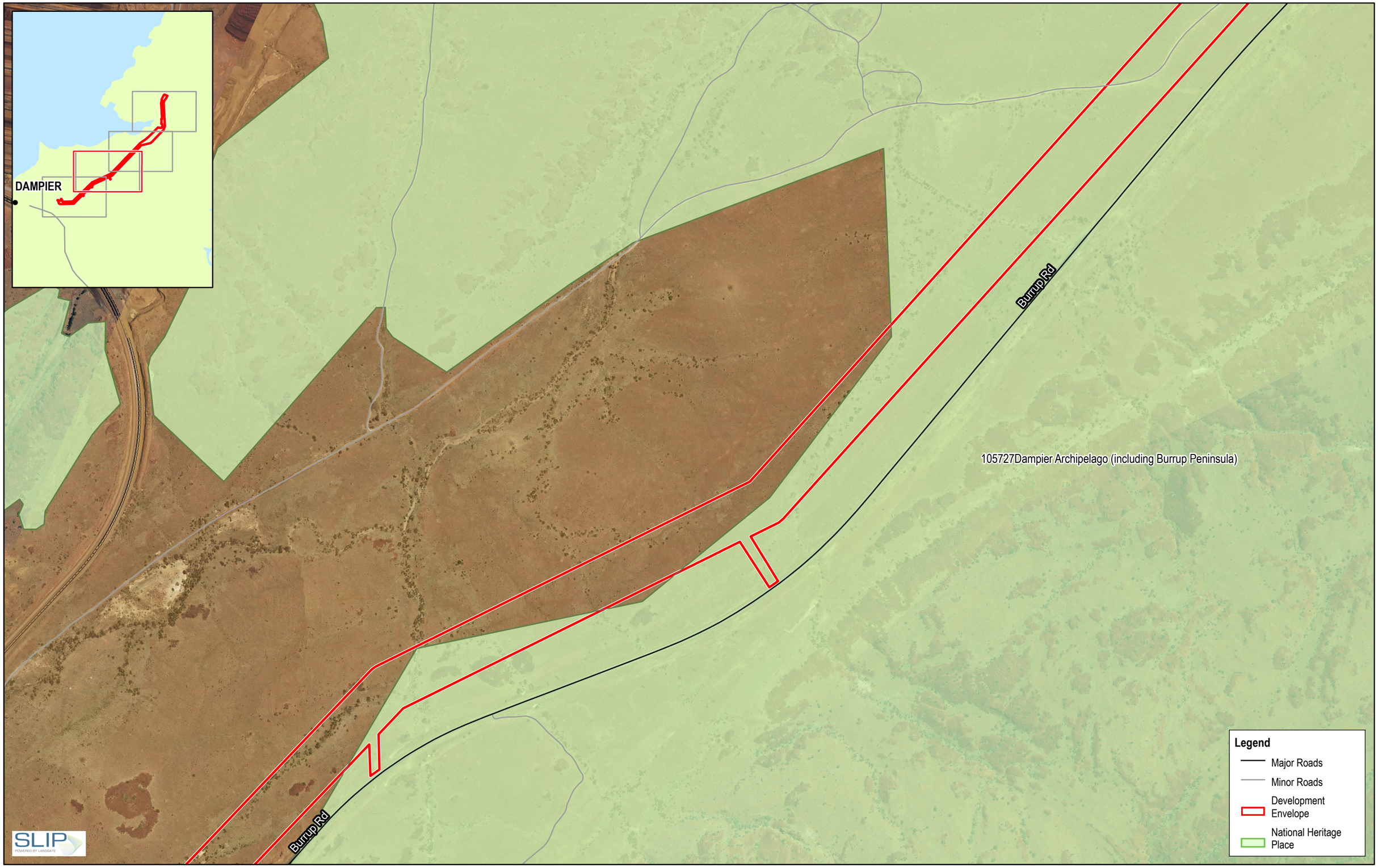

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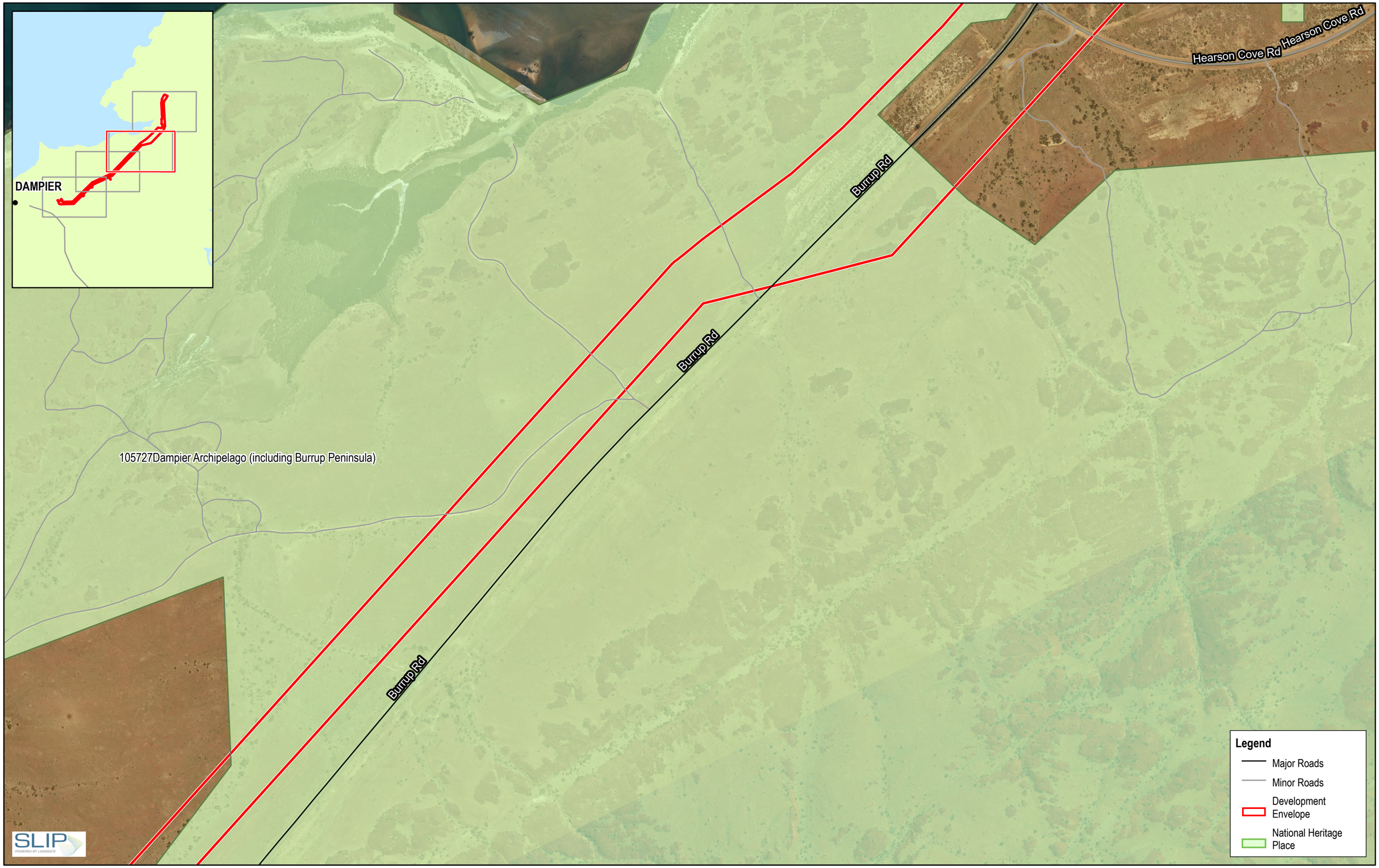

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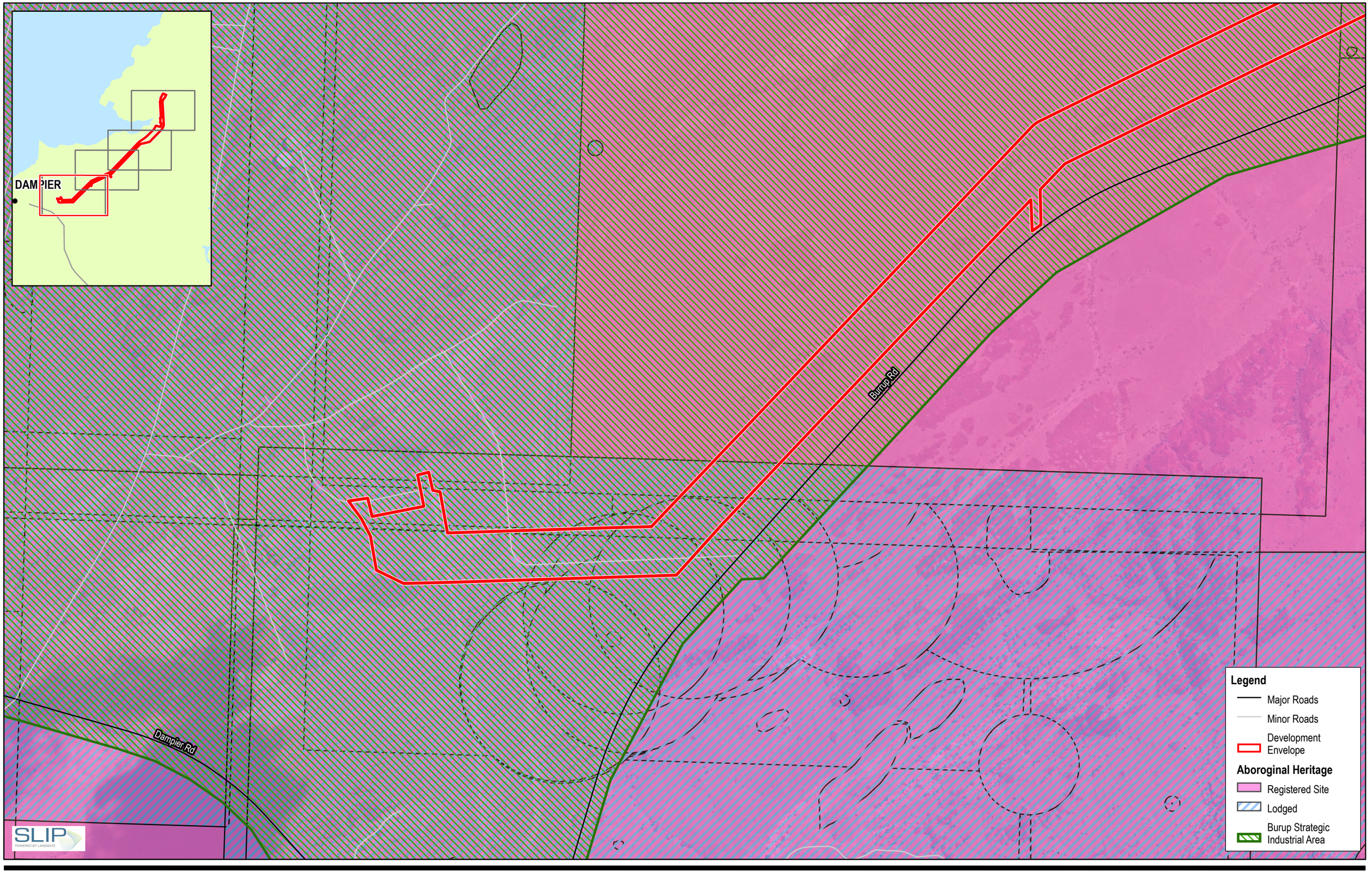
6.3.2.4.3 Native Title

The Proposal is not located within an Indigenous Land Use agreement (ILUA) area (including those registered or in notification with the National Native Title Tribunal) (LGATE-067, LGATE-173).

In 2003 the Ngarluma-Yindjibarndi, Wong-Goo-Tt-Oo, and Yaburara Mardudhunera people surrendered their native title rights and interests over the land and waters of the Burrup Peninsula, as documented in the Burrup and Maitland Industrial Estates Agreement (BMIEA). The DE does not appear to intersect areas over which the BMIEA specifically applies (Development WA 2022).

6.3.2.4.4 Aboriginal cultural heritage features

A search of the Aboriginal Heritage Inquiry System (AHIS) indicates that the buffers of 76 registered sites and 39 lodged sites intersect the DE (Figure 6-12). Registered and lodged sites include a variety of types, the most common being engravings and scatters. Additionally, Horizon Power commissioned a number of Aboriginal cultural heritage surveys to site avoidance standard over the DE to ensure all known Aboriginal cultural heritage intersecting the DE can be avoided.



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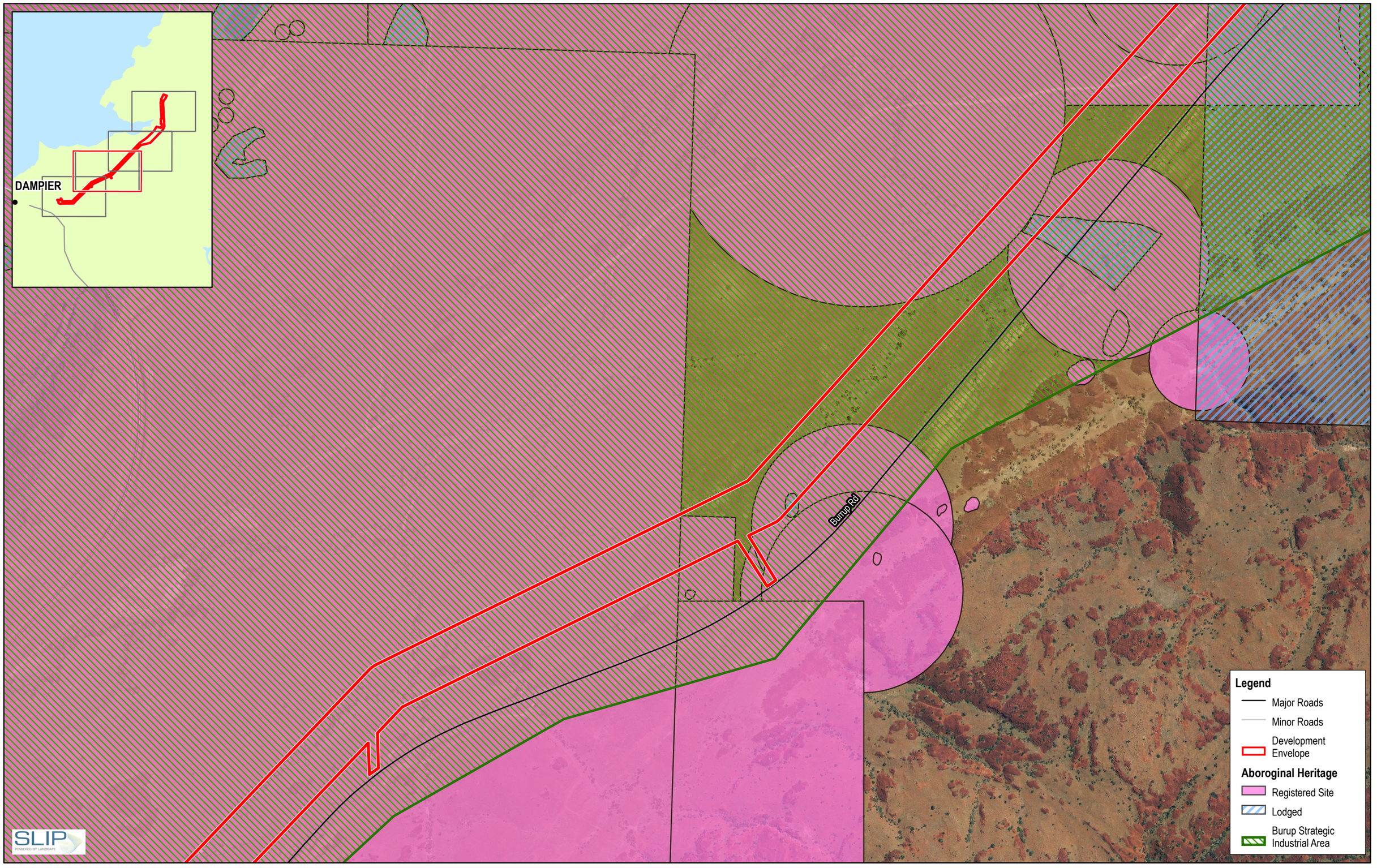

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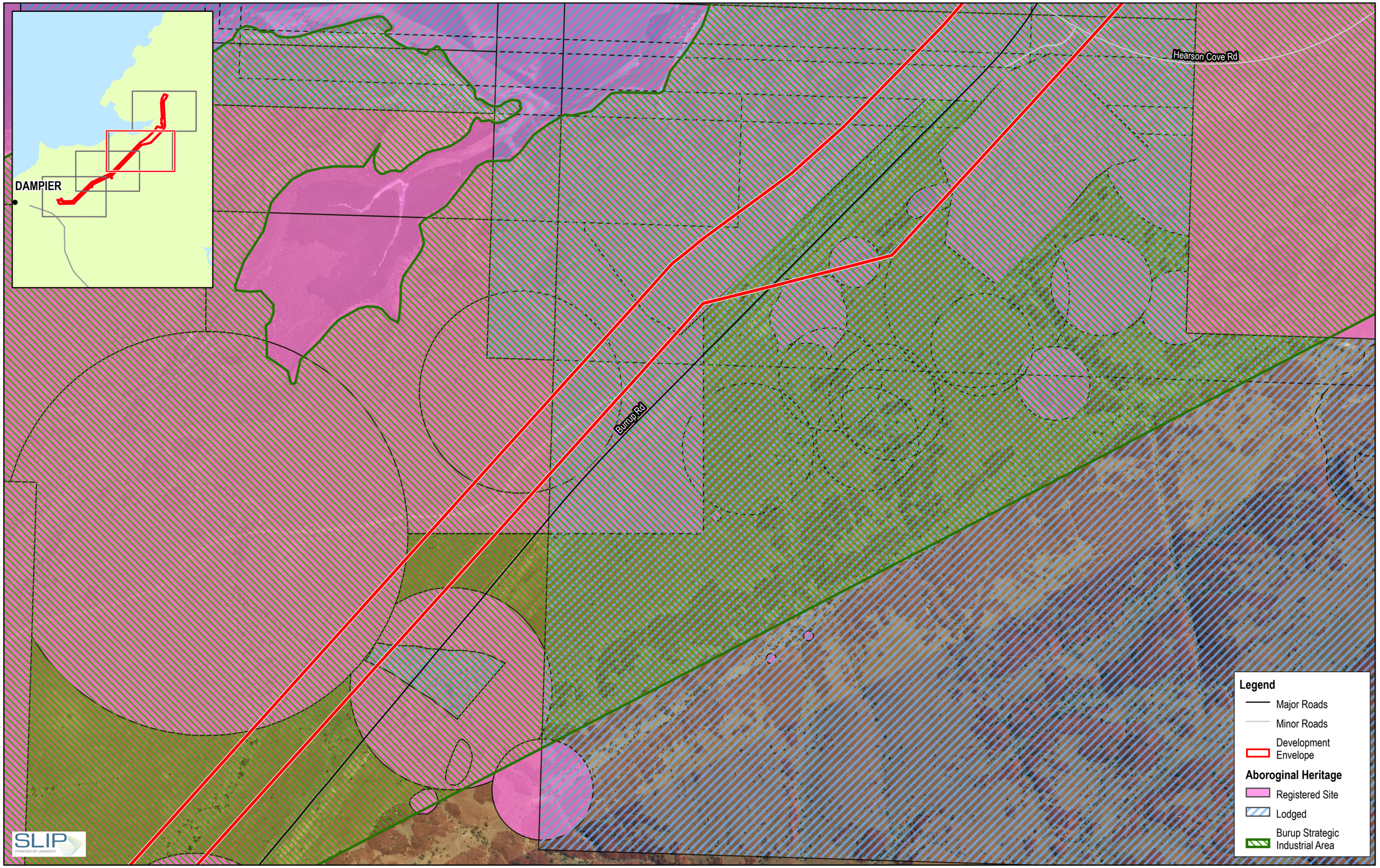

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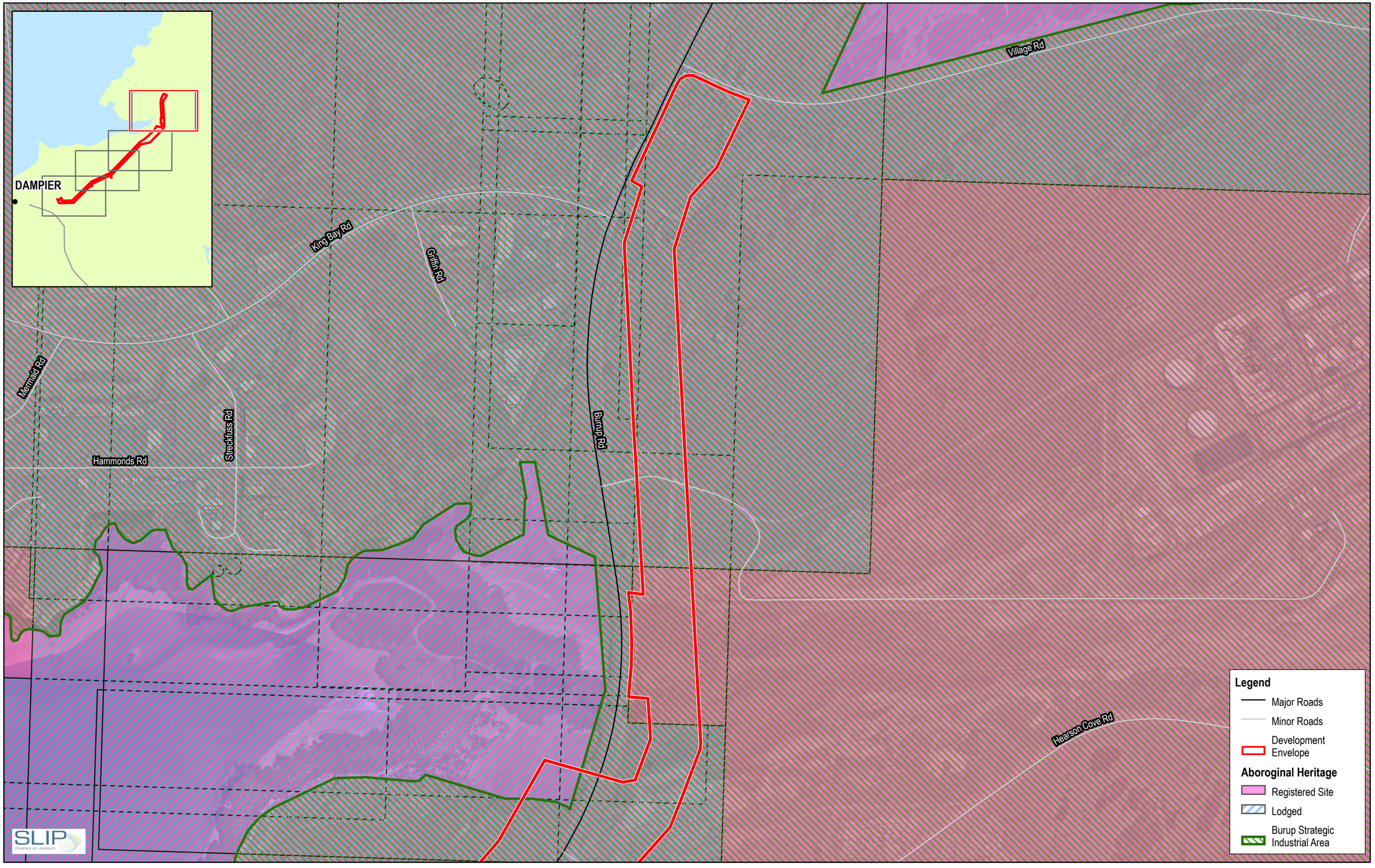

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6.3.2.4.5 Aboriginal cultural heritage surveys

Aboriginal cultural heritage values of the Dampier Archipelago National Heritage Place are not definitively mapped, hence archaeological and ethnographic site avoidance surveys have been undertaken of all areas within the DE to confirm the location and extent of Aboriginal cultural heritage.

CBG (2020) Archaeological and Ethnographic Survey

The CBG (2020) archaeological and ethnographic survey covers the majority of the DE, the report will not be included in the referral at the request of Traditional Owners. Aboriginal cultural heritage was recorded with GPS and the boundaries demarcated by walking transects and recording waypoints where Aboriginal cultural features were no longer present. The boundary of previously recorded DPLH sites were retained where assessed to sufficiently encompass the extent of all site features. Recommendations were developed collaboratively with daily discussions held between MAC representatives and the CBG archaeologist and anthropologist.

> The archaeology definition of an Aboriginal site is '*A location with sufficient archaeological material, with adequate spatial context and environmental integrity, where it can unequivocally be demonstrated that techniques of Aboriginal hunter-gatherer subsistence technologies occurred at the location, and that the location is of importance and significance to further the knowledge of Aboriginal lifeways through archaeological investigation.*' (CBG 2020).
>
> The ethnography definition of an Aboriginal site is '*A location with known cultural, historical, ceremonial and/or mythological importance and significance to the cultural interests of the relevant Aboriginal Traditional Owners.*' (CBG 2020).

CBG (2020) identified 48 sites of Aboriginal heritage significance within the DE, the majority associated with rock art (Table 6-18). Of these, 12 represent Registered Aboriginal Sites and 16 are new finds. Ethnographically, almost all engravings where some level of interpretation is possible are considered significant.

Table 6-18 Aboriginal cultural heritage avoidance areas (CBG 2020)

Site ID	DPLH ID	Site Type
KANGAROO ROCKS	9027	Engraving
PUMP ROAD QUARRY	9286	Engraving/Quarry
SWAMP CASTLE	9400	Engraving/Man-Made Structure
SMALL RIDGE SITE	9458	Man-Made Structure
MANDARIN KNOLL	9471	Engraving
ROCKY OUTLOOK	9473	Engraving/Grinding Patch
THOUGHTFUL MAN SITE	9474	Engraving/Man-Made Structure
DUGONG MIDDEN	9597	Engraving/Grinding Patch

Site ID	DPLH ID	Site Type
BORROW PIT VIEWS	9599	Engraving
BORROW PIT AREA 7	9755	Engraving
GAS PIPELINE 15	10565	Engraving/Man-Made Structure
GAS PIPELINE 17	10567	Engraving/Man-Made Structure
GAS PIPELINE 18	10568	Engraving
GAS PIPELINE 21	10571	Engraving
DESALINATION PLANT ENGRAVING	20035	Engraving
DESALINATION PLANT ENGRAVING	20038	Engraving
CEM-09-ENG-002	28461	Engraving
DAMPIER ROAD ENGRAVING 1	28943	Engraving/Man-Made Structure
DAMPIER ROAD ENGRAVING 3	28945	Engraving
HPTL_001	N/A	Engraving
HPTL_002	N/A	Engraving
HPTL_003	N/A	Engraving
HPTL_004	N/A	Engraving/Grinding Patch
HPTL_005	N/A	Engraving
HPTL_006	N/A	Engraving
HPTL_007	N/A	Modified Tree
HPTL_008	N/A	Engraving
HPTL_009	N/A	Man-Made Structure
HPTL_010	N/A	Grinding Patch
HPTL_011	N/A	Engraving
HPTL_012	N/A	Engraving
HPTL_013	N/A	Engraving
HPTL_014	N/A	Grinding Patch
HPTL_015	N/A	Engraving
HPTL_016	N/A	Engraving
HPTL_017	N/A	Modified Tree
HPTL_018	N/A	Man-Made Structure

Site ID	DPLH ID	Site Type
HPTL_019	N/A	Engraving
HPTL_020	N/A	Engraving
HPTL_021	N/A	Engraving
WTL_001	N/A	Quarry
WTL_002	N/A	Engraving
WTL_003	N/A	Engraving
WTL_004	N/A	Engraving
WTL_005	N/A	Engraving
WTL_007	N/A	Engraving
WTL_008	N/A	Engraving/Grinding Patch
WTL_009	N/A	Grinding Patch

The CBG (2020) report makes the following key recommendations:

- Impact to all Aboriginal cultural heritage sites (as mapped) should be avoided;
- Development south of Burrup Road be avoided;
- Ensure Aboriginal cultural heritage monitors (as appointed by MAC) are present during initial ground disturbing works;
- Avoid, where possible, any moderate to large sized granite outcrops and creeks;
- Engage MAC in the development of a Cultural Heritage Management Plan for the Proposal;
- Aboriginal cultural heritage sites are visibly demarcated during construction (where works are nearby) to prevent inadvertent impacts; and
- Development of 'administrative work packs' for Aboriginal cultural heritage sites close to work areas to monitor their condition (pre and post construction).

Archae-aus and BGA (2019) Archaeological and Ethnographic Surveys

The southernmost portion of the DE (not surveyed by CBG 2020) was previously surveyed by Archae-aus and BGA (2019), the reports will not be provided in the referral at the request of the Traditional Owners.

Section 5 of the survey area (the northern portion of which intersects the DE) was inspected using a series of parallel transects with Archae-aus archaeologists and Ngarluma Traditional Owners spaced up to 10 m apart. The terrain was visually inspected for archaeological material, with locations recorded using a hand-held GPS.

No Aboriginal cultural heritage was recorded in survey areas intersecting the DE. The southern portion of the DE (northern portion of the Section 5 survey area) is reported to comprise previously disturbed areas associated with the construction of powerlines, water

pipelines and associated access tracks. Further south (outside of the DE) are granophyre boulder strewn hills of Aboriginal cultural heritage significance (Archae-aus 2019).

Ethnographic site avoidance survey of the Karratha to Dampier 132kV transmission line upgrade corridor. The ethnographic survey team met with the archaeological survey team (Archae-aus) on several occasions in the field to discuss, review, and assess potential ethnographic significance associated with the archaeological findings(BGA 2019 – CONFIDENTIAL).

Scarp (2022) Archaeological Survey

Areas of the DE not previously surveyed by CBG (2020) or Archae-aus (2019) were surveyed for archaeological Aboriginal cultural heritage values by Scarp (2022), the full report will not be provided in the referral at the request of the Traditional Owners.

The King Bay survey area (southern polygon – roadside corridor) and Access Tracks 1, 2 and 3 were inspected by Scarp archaeologists and MAC participants by walking transects spaced up to 10 m apart. The survey focus was to identify the location and extent of archaeological materials, with locations recorded using a hand-held GPS.

No Aboriginal cultural heritage was recorded within the polygons for Access Tracks 1, 2 and 3.

Scarp (2022) identified 12 locations likely to be considered sites, including 3 potential new sites of Aboriginal cultural heritage significance within the King Bay survey area, including two standing stones with engravings, and a complex quarry, artefact scatter and engraving site (Table 6-19).

Table 6-19 Potential new Aboriginal cultural heritage avoidance areas (Scarp 2020)

Site ID	DPLH ID	Site Type
HP-2022-A001-10	Likely a new site	Single Standing Stone
HP-2022-A001-11	Likely a new site	Rock Pile / Engravings
HP-2022-A001-12	Likely “Pump Road Quarry” (ID 9286)	Scatter / Quarry / Engravings

The Scarp (2022) report makes the following key recommendations:

- Impact to all Aboriginal cultural heritage sites (newly recorded and previously verified) should be avoided;
- DPLH be notified of all newly recorded sites (including the revised site boundary for Pump Road Quarry);
- Survey findings be reviewed and approved by MAC prior to ground disturbing works commencing in cleared areas; and
- Potential new finds (including human remains) uncovered during ground disturbing works are protected (i.e. cease work in the immediate area until assessed by MAC and a consultant archaeologist/anthropologist as appropriate, and cleared by police if relating to human remains).

Acacia (2022) Ethnographic Survey

Areas of the DE not previously ethnographically surveyed by CBG (2020) and BGA (2019) were surveyed for ethnographic Aboriginal cultural heritage values by Acacia (2022), the full report will not be provided in the referral on the request of the Traditional Owners.

The King Bay survey area, which includes areas of the DE immediately adjacent and south of the King Bay tidal zone, was ethnographically cleared for works to proceed, so long as the 'standing stone' identified by Scarp 2022 was protected.

The original proposed Access Track 3 into the DE was not ethnographically cleared during the survey. To avoid any potential impacts to Aboriginal cultural heritage, Horizon Power has amended the DE to exclude this original access and has included a new alignment for Access Track 3 as per the recommendation by Scarp (2022), located approximately 50-100 m north-east of the original alignment. The new alignment for Access Track 3 (and current DE) has been ethnographically cleared by Acacia (2022).

Access Tracks 1 and 2 were also ethnographically cleared for works to proceed, the Murujunga Traditional Owners confirming these polygons do not intersect Registered Aboriginal Site ID 20373.

The report recommends that Murujuga Traditional Custodians are present during all ground disturbing works.

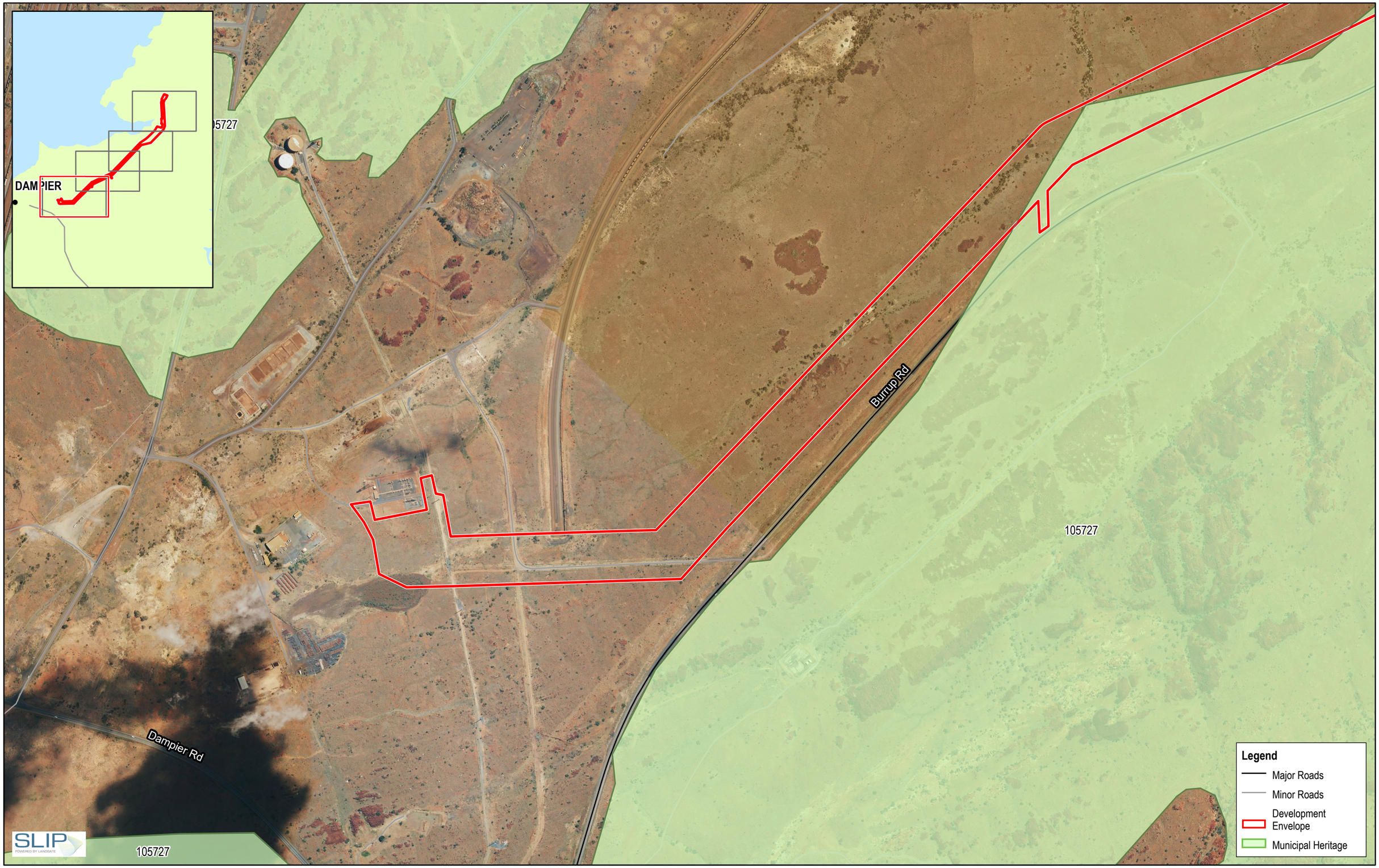
6.3.2.4.6 European heritage

A search of the Heritage Council WA inHerit database confirms no State Heritage sites occur within 10 km of the DE (DPLH-006) (Figure 6-13).

One municipal heritage site, Dampier Archipelago (including Burrup Peninsula) (ID: 25086), intersects portions of the DE (Figure 6-13). This site is listed on the Karratha Municipal Heritage Inventory (DPLH-008).

6.3.2.5 Nature reserves

The Murujuga National Park is located within close proximity, approximately 100 m north and 180 m east of the DE (Figure 6-9). Impacts to the Murujuga National Park are assessed in Section 6.1.



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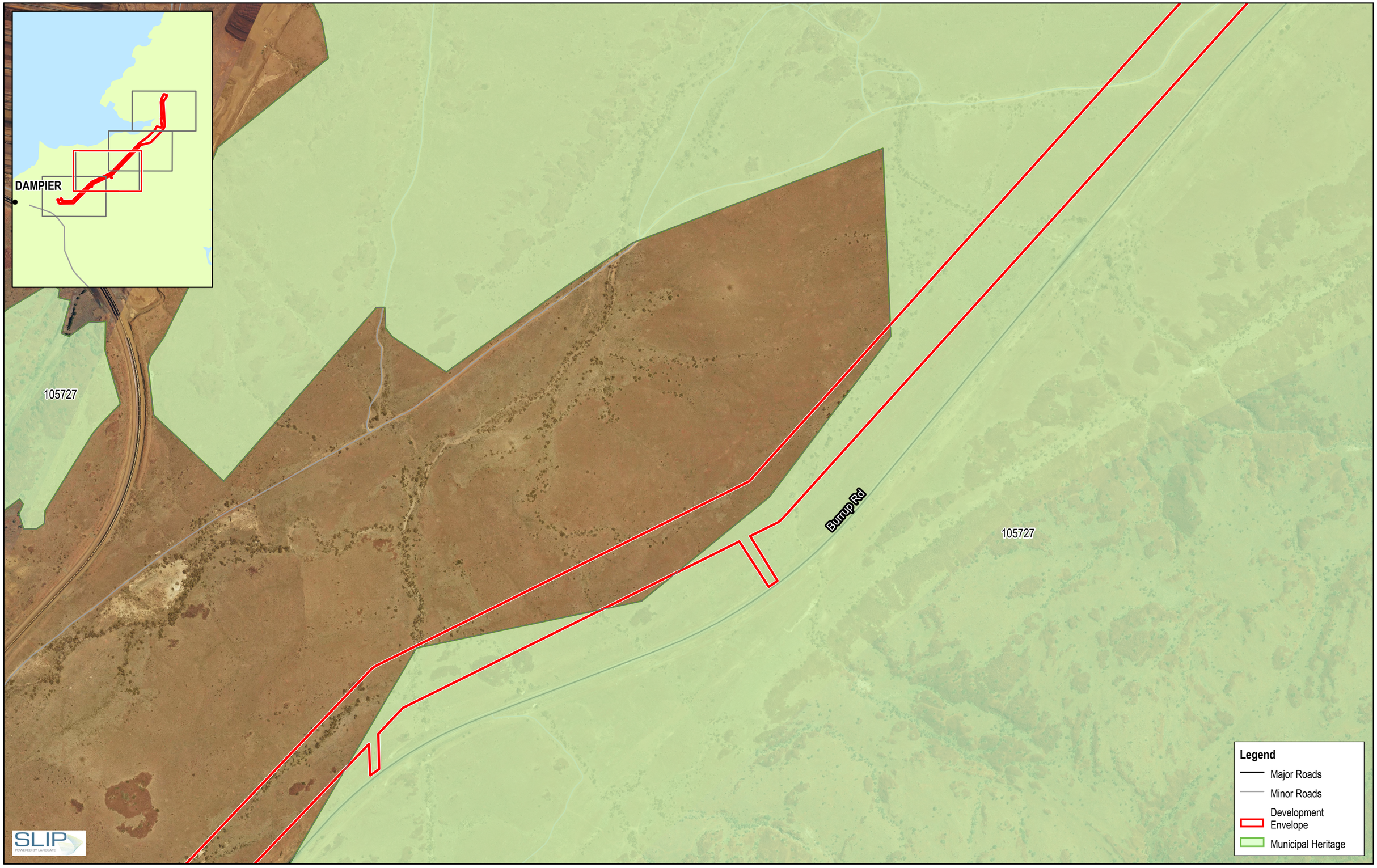

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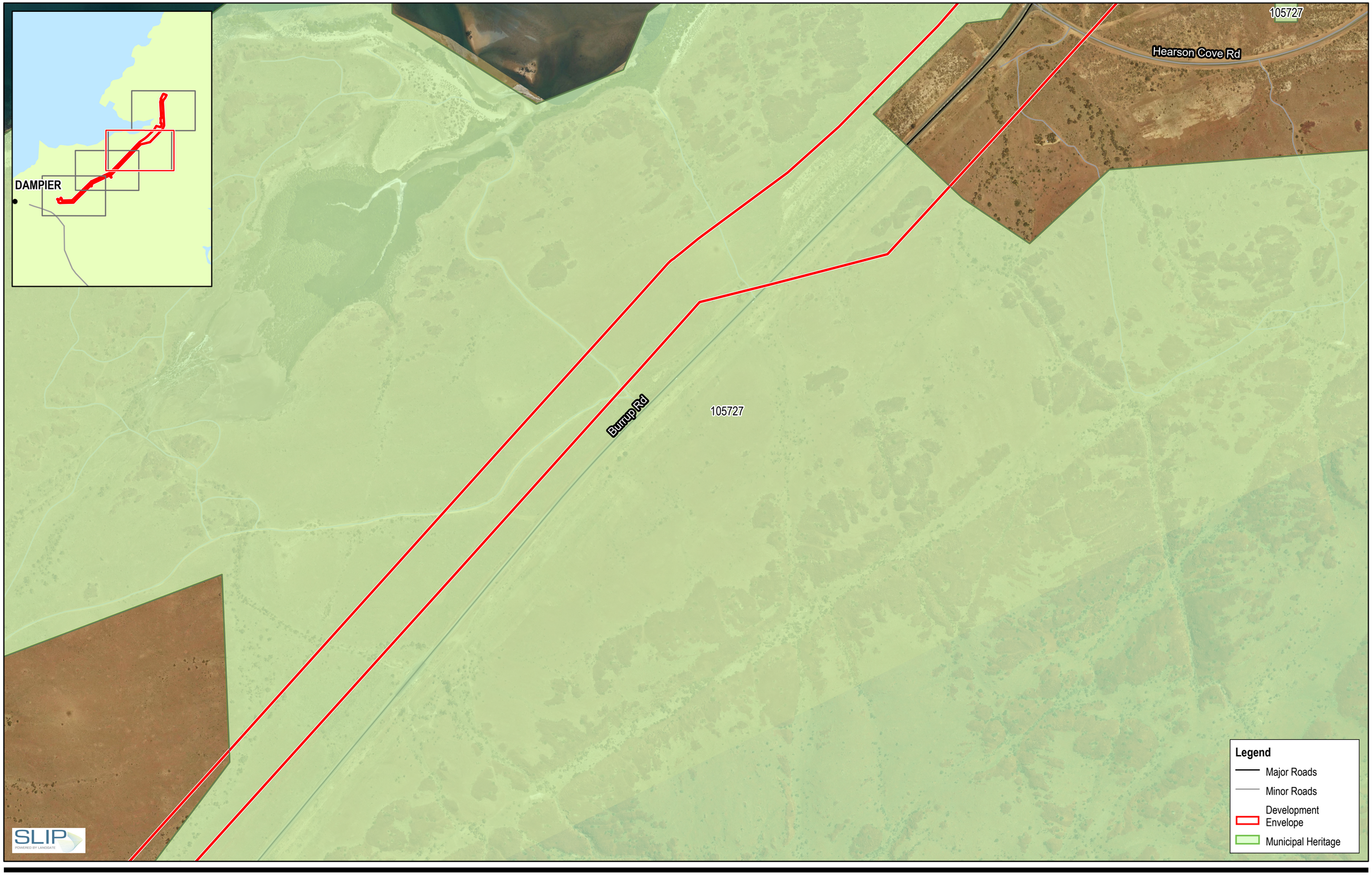

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6.3.3 Potential impacts

Potential impacts to social surrounds from implementation of the Proposal are detailed in the following sections.

6.3.3.1 *Aboriginal cultural heritage*

6.3.3.1.1 Direct impacts

The Proposal has been designed in consultation with traditional owners of MAC and NAC, and consultant archaeologists and anthropologists.

The location and extent of Aboriginal cultural heritage within the DE has been confirmed by CBG 2020, Scarp 2022, and Acacia (refer to Table 6-18 and Table 6-19). Horizon Power is committed to avoiding direct impacts to all known Aboriginal cultural heritage, and to guarantee their protection has developed 'no-go zones' within the DE (Figure 2-2). All known Aboriginal cultural heritage sites will be included within the 'no-go zones'.

There remains potential for previously unknown Aboriginal cultural heritage to be uncovered during ground disturbing works during the construction phase.

6.3.3.1.2 Indirect impacts

The Proposal has the potential to indirectly impact Aboriginal cultural heritage and values of the DE and surrounding areas through:

- Dust generation during construction (transient, short term) has the potential to settle on rock art within or adjacent to the DE;
- Vibrations during construction (transient, short term) has the potential to cause physical damage to Aboriginal cultural heritage within or adjacent to the DE; and
- Accidental fires during construction or operations, has the potential to cause physical damage to Aboriginal cultural heritage within or adjacent to the DE.

6.3.3.1.3 Cumulative impacts

Cumulative impacts to Aboriginal cultural heritage, as it relates to registered sites and places has not been assessed for this Proposal given:

- Horizon Power is committed to avoiding direct impacts to known Aboriginal cultural heritage sites and places through the developed 'no-go zones' within the DE (Figure 2-2) during construction and operations;
- Potential indirect impacts to known Aboriginal cultural heritage sites and places (i.e. vibrations during drilling) would only occur for a short duration and only in the construction phase and is therefore not expected to have an adverse impact; and
- The potential for impact to unexpected finds (previously unrecorded Aboriginal cultural heritage sites and places) during construction can be adequately mitigated through the measures detailed in Section 6.3.4.1.

Horizon Power acknowledges that ongoing industrial development on the Burrup may place increased pressure on Nationally (and future World) recognised Aboriginal rock art, and that together these developments may have a cumulative impact on Aboriginal cultural heritage values. However, development of the Proposal is not expected to contribute to these impacts.

6.3.3.2 National and European heritage

6.3.3.2.1 Direct impacts

The Proposal will have the following direct impacts on National and European heritage:

- Construction of the Proposal will directly disturb land within National Heritage Place 'Dampier Archipelago (including Burrup Peninsula)' (Place No. 105727); and
- Construction of the Proposal will directly disturb land within municipal heritage site, 'Dampier Archipelago (including Burrup Peninsula)' (ID: 25086).

6.3.3.2.2 Indirect impacts

The Proposal has the potential to indirectly impact National and European heritage within the DE and surrounding areas through:

- Dust generation during construction (transient, short term) has the potential to settle on rock art within or adjacent to the DE (a key value of the Dampier Archipelago National Heritage Place), as well as impacting amenity of the DE and surrounds;
- Vibrations during construction (transient, short term) has the potential to cause physical damage to heritage sites within or adjacent to the DE (a key value of the Dampier Archipelago National Heritage Place), as well as impacting amenity of the DE and surrounds; and
- Accidental fires during construction, has the potential to cause physical damage to heritage sites within or adjacent to the DE (a key value of the Dampier Archipelago National Heritage Place), as well as impacting amenity of the DE and surrounds.

6.3.3.2.3 Cumulative impacts

Cumulative impacts to Aboriginal cultural heritage, as it relates to registered sites and places has not been assessed for this Proposal (refer to Section 6.3.3.1.3 for justification).

Known or potential cumulative impacts to National and European heritage (including Aboriginal cultural heritage values where relevant), resulting from implementation of this Proposal is assessed in Table 6-20.

Table 6-20 Cumulative impacts National and European heritage from other Proposals

Aspect / Project	Burrup Common User Transmission Infrastructure Current Proposal	Karratha Gas Plant	Liquid Ammonia Plant	Pluto LNG Development	Technical Ammonium Nitrate Production Facility	Ammonia Plant and Renewable Hydrogen Project	Perdaman Urea Project	North West Shelf Project Extension*	Pluto North West Shelf Interconnector Pipeline	Cumulative impact
Proponent	Horizon Power	Woodside Energy Ltd	Yara Pilbara Fertilisers Pty Ltd	Woodside Energy Ltd	Yara Pilbara Fertilisers Pty Ltd (initially referred by Burrup Nitrates Pty Ltd)	Yara Pilbara Fertilisers Pty Ltd	Perdaman Chemical and Fertilisers Pty Ltd	Woodside Energy Ltd	AGI Operations Pty Ltd	N/A
Proposed Project commencement	2023	1989	2003	2007	2008	2021	2020 - 2023	~2023	2022	N/A
Description	Development of a 132 kV overhead transmission line between the Dampier Substation and the proposed Burrup Substation (the Proposal).	Woodside's Karratha Gas Plant to produce LNG, domestic gas, condensate and LPG.	Production of liquid ammonia within the City of Karratha, Dampier.	The construction of facilities for the development of the Pluto Gas Field on the North-West Shelf, and the processing and export of the gas at a liquefied natural gas plant to be constructed	Construction and operation of a technical ammonium nitrate facility adjacent to Yara Pilbara's existing liquid ammonia plant on the Burrup Peninsula.	Development of a Renewable Hydrogen Plant and associated infrastructure, including a dedicated solar photovoltaic (PV) farm, electrolyser and its balance of plant, and supporting infrastructure,	Construction and operation of a urea plant with a production capacity of approximately 2 million tonnes per annum (Mtpa) within the Burrup Strategic Industrial Area (BSIA) on the Burrup Peninsula.	Ongoing operation of the North West Shelf Project to enable the long-term processing of third party gas and fluids and North West Shelf Joint Venture field resources through the North West Shelf Project facilities until around 2070.	Construction and operation of a 3.3 km long steel buried natural gas pipeline, connecting the Pluto Interconnector Compressor Station to the Karratha Gas Plant.	N/A

Aspect / Project	Burrup Common User Transmission Infrastructure Current Proposal	Karratha Gas Plant	Liquid Ammonia Plant	Pluto LNG Development	Technical Ammonium Nitrate Production Facility	Ammonia Plant and Renewable Hydrogen Project	Perdaman Urea Project	North West Shelf Project Extension*	Pluto North West Shelf Interconnector Pipeline	Cumulative impact
National and European heritage	Construction and disturbance of up to 14.40 ha within the Dampier Archipelago (including Burrup Peninsula) National and European heritage place. However, no direct or indirect impacts to Aboriginal cultural heritage sites known to be associated or potentially associated with the Dampier Archipelago National and European heritage place values.	Proposal was approved prior to listing of the Dampier Archipelago (including Burrup Peninsula) as a National and European heritage place. Impacts were therefore not assessed at this time. Potential indirect impacts to Dampier Archipelago (including Burrup Peninsula) National and European heritage place.	Proposal was approved prior to listing of the Dampier Archipelago (including Burrup Peninsula) as a National and European heritage place. Impacts were therefore not assessed at this time. No direct impact to values of the Dampier Archipelago (including Burrup Peninsula) National and European heritage place. Potential indirect impacts to Dampier Archipelago (including Burrup Peninsula) National and European heritage place.	Proposal was assessed prior to listing of the Dampier Archipelago (including Burrup Peninsula) as a National and European heritage place. Impacts were therefore not assessed at this time. No direct impact on national parks (listed at the time the proposal was referred). Direct impact on Dampier Archipelago Marine Park.	No direct impact to the Dampier Archipelago (including Burrup Peninsula) National and European heritage place. Potential indirect impacts to Dampier Archipelago (including Burrup Peninsula) National and European heritage place.	No direct impact to values of the Dampier Archipelago (including Burrup Peninsula) National and European heritage place. Potential indirect impacts to Dampier Archipelago (including Burrup Peninsula) National and European heritage place.	Located within the Burrup SIA adjacent to the Dampier Archipelago (including Burrup Peninsula) National and European heritage place, therefore direct impacts are avoided. Potential indirect impacts to Dampier Archipelago (including Burrup Peninsula) National and European heritage place.	Located within the Burrup SIA (adjacent to Murujuga National Park). No direct impacts to Aboriginal cultural heritage resulting from the Proposal. Potential indirect impacts to Dampier Archipelago (including Burrup Peninsula) National and European heritage place.	Located within the Burrup SIA (adjacent to Murujuga National Park). No direct or indirect impact to the Dampier Archipelago (including Burrup Peninsula) National and European heritage place.	Direct and indirect impacts to the Dampier Archipelago (including Burrup Peninsula) National and European heritage place.

*The North West Shelf Project Extension is currently under EPA assessment (the revised Ministerial Statement had not been issued at the time of writing this document).

6.3.3.3 Amenity

6.3.3.3.1 Direct impacts

The Proposal has the potential to impact on the visual amenity of the local area, noting that proposed infrastructure is consistent with existing transmission infrastructure in the region.

The proposed 132 kV overhead transmission line will be most visible from Burrup Road, Dampier Highway, and topographic highs present within the adjacent Dampier Archipelago (including Burrup Peninsula) National Heritage Place. The transmission line is unlikely to be visible from residential areas of Dampier.

6.3.3.3.2 Indirect impacts

The Proposal has the potential to indirectly impact amenity of areas surrounding the DE through dust, noise and vibration emissions generated during construction (transient, short term).

6.3.3.3.3 Cumulative impacts

The Proposal, and other Proposals in the surrounding area, have the potential to result in cumulative impacts to visual amenity. The Proposals are in line with existing infrastructure in the region and consistent with the Strategic Industrial land zoning of the area. The Proposal is not expected to provide any additional impacts to visual amenity.

6.3.4 Mitigation

6.3.4.1 Aboriginal cultural heritage

Key measures to avoid impacts to Aboriginal heritage include:

- Site selection for DE has taken into account CBG (2020) recommendation that 'development south of Burrup Road be avoided'. Extensive consultation has been undertaken with MAC on the DE location. The current DE is preferred as it already contains infrastructure and Aboriginal cultural heritage within it can be managed without impact (CBG 2020);
- Modification of the Proposal DE (specifically Access Track 3) to avoid direct impacts to potential Aboriginal cultural heritage values (Scarp 2022, Acacia 2022);
- Modification of the Proposal footprint to avoid direct impacts to known Aboriginal cultural heritage as mapped by CBG (2020) (Table 6-18) and Scarp (2022) (Table 6-19);
- The inclusion of 'no-go zones' within the DE (Figure 2-2) to avoid direct impacts to known Aboriginal cultural heritage as mapped by CBG (2020) (Table 6-18) and Scarp (2022) (Table 6-19);
- Prior to conducting ground disturbing activities, known Aboriginal cultural heritage close to construction activities is to be demarcated via appropriate signage, fencing or flagging (where permitted by and with assistance of MAC);
- Use of helicopters for stringing (at some locations) to minimise ground disturbance.

Measures to mitigate impacts to Aboriginal cultural heritage (as recommended by CBG 2020) include:

- Aboriginal cultural heritage monitors (as appointed by MAC) will be present during initial ground disturbing works;
- Construction activities will avoid, where possible, any moderate to large sized granite outcrops and creeks;
- Development of a Cultural Heritage Management Plan (CHMP) (engaging MAC in the preparation and review of the CHMP);
- Prior to conducting ground disturbing activities, known Aboriginal cultural heritage sites close to construction activities are to be demarcated via appropriate signage, fencing or flagging (where permitted by and with assistance of MAC);
- Development of 'administrative work packs' for Aboriginal cultural heritage sites close to work areas to monitor their condition (pre and post construction); and
- Dust, vibrations and fire risk will be managed in accordance with the Proposal Construction Environmental Management Plan (CEMP).

Measures to mitigate impacts to Aboriginal cultural heritage (as recommended by Scarp 2022) include:

- Impact to all Aboriginal cultural heritage sites (newly recorded and previously verified) should be avoided;
- DPLH be notified of all newly recorded sites (including the revised site boundary for Pump Road Quarry);
- Survey findings be reviewed and approved by MAC prior to ground disturbing works commencing in cleared areas; and

- Potential new finds (including human remains) uncovered during ground disturbing works are protected (i.e. cease work in the immediate area until assessed by MAC and a consultant archaeologist/anthropologist as appropriate, and cleared by police if relating to human remains).

Measures to mitigate impacts to Aboriginal cultural heritage (as recommended by Acacia 2022) include:

- Aboriginal cultural heritage monitors (Murujuga Traditional Custodians) will be present during initial ground disturbing works; and
- Access to the DE via the revised alignment for Access Track 3 (cleared by Scarp 2022 and Acacia 2022) (note the proposed DE boundary corresponds to this revised alignment).

6.3.4.2 *National and European heritage*

One of the key values of the 'Dampier Archipelago (including Burrup Peninsula)' National Heritage Place is Aboriginal cultural heritage including dreaming sites, ceremonial sites, rock engravings and archaeological sites. Measures to avoid and mitigate impacts to Aboriginal cultural heritage values are provided in Section 6.3.4.1 (above).

The Proposal will mitigate impact to the intertidal zone through implementation of measures such as:

- Minimising disturbance in the intertidal zone (i.e. limit as far as reasonably practicable constructing access tracks within the tidal inlet between Hearson Cove and King Bay).

6.3.4.3 Amenity

Measures to mitigate impacts to visual amenity include:

- Use of 132 kV overhead transmission line (approximate pole height of 20-28 m) consistent with existing transmission infrastructure in the region (i.e. lowest visual impact for overhead transmission line);
- Alignment of transmission line with existing services (i.e. water, roads); and
- Use of existing disturbed areas to minimise clearing.

Measures to mitigate impacts to amenity from dust, noise and vibrations include:

- Dust, vibrations and fire risk will be managed in accordance with the Proposal CEMP (Appendix 1). CEMP mitigation measures will include (but are not limited to):
    - Construction works will be undertaken in accordance with the E*nvironmental Protection (Noise) Regulations 1997;*
    - Dust suppression controls (i.e. use of water carts) to be implemented.

6.3.5 Assessment and significance of residual impact

6.3.5.1 Aboriginal cultural heritage

Construction of the Proposal has the potential to physically impact on Aboriginal cultural heritage present within the DE. However, Horizon Power is committed to avoiding direct impacts to all known Aboriginal cultural heritage and will ensure this avoidance commitment is upheld through the delineation of 'no-go zones areas' within the DE. Visibly demarcating 'no-go zones areas' during construction (where works are nearby) and ensuring a minimum 5 m buffer is maintained between no-go zones and work areas will ensure inadvertent impacts are prevented.

Horizon Power has commissioned Aboriginal cultural heritage surveys (archaeological and ethnographic) with support from MAC and NAC of the entire DE. Accordingly Horizon Power is confident that all ethnographic and above ground Aboriginal cultural heritage have been identified and can be avoided. Any residual risk associated with uncovering previously unknown Aboriginal cultural heritage during ground disturbing works will be mitigated through a commitment to have Aboriginal cultural heritage monitors (as appointed by MAC) present during initial ground disturbing works.

6.3.5.2 National and European heritage

Construction of the Proposal will directly impact land within 'Dampier Archipelago (including Burrup Peninsula)' National Heritage Place (Place No. 105727), which is also a municipal heritage site (ID: 25086) as listed on the Karratha Municipal Heritage Inventory.

Horizon Power is committed to mitigating impacts (where possible) to listed heritage values of the 'Dampier Archipelago (including Burrup Peninsula)'. Terrestrial (land) based heritage values are associated with Aboriginal heritage, hence the mitigation measures proposed to protect Aboriginal heritage will also ensure key values of the 'Dampier Archipelago (including Burrup Peninsula)' are protected.

Natural heritage values of the 'Dampier Archipelago (including Burrup Peninsula)' associated with the intertidal zone are not likely to be significantly impacted by the Proposal, given the short-term nature of impacts proposed (construction phase only) and mitigation proposed (i.e. minimise disturbance footprint through use of helicopters, where possible, for stringing to avoid the need for continuous access roads through the intertidal zone).

The Proposal will not result in impacts to any State Heritage sites listed under the *Heritage Act 2018* (WA).

6.3.5.3 *Amenity*

Due to the nature of the Proposal the majority of impacts to amenity (i.e. dust, noise, vibrations) will occur only during the construction phase. Impacts will be of a short-term duration and can be adequately managed through a CEMP (Appendix 1).

The Proposal will however have a long-term impact on visual amenity from permanent infrastructure installed above ground (132 kV overhead transmission line). As detailed in Section 6.3.4.3, the Proposal design has been selected to minimise impacts to visual amenity (i.e. limiting pole height to approximately 20 – 28 m). The transmission line design is consistent with existing transmission infrastructure in the region, and the DE route has been

selected to align with existing service corridors adjacent to Burrup Road in order to limit environmental and social impacts (including impacts to visual amenity).

Visual impacts from the Proposal are considered minor in the context of existing and proposed disturbances in the Burrup SIA.

6.3.5.4 Summary of significant residual impacts

Based on the impacts identified and the mitigation proposed, the Proposal is not expected to have a significant residual impact on social surroundings.

6.3.6 Environmental outcomes

Table 6-21 provides a summary of the environmental outcomes for the Proposal relating to relevant factors identified for EPA factor 'social surroundings'.

Table 6-21 Environmental outcomes for social surrounds

Factor	Outcomes
Aboriginal heritage	No direct impacts to known Aboriginal cultural heritage sites within or adjacent to the DE. Works undertaken for the Proposal will comply with the *Aboriginal Heritage Act 1972* (WA) (or the *Aboriginal Cultural Heritage Act 2021* (WA) when it comes into full effect) and *Heritage Act 2018* (WA). Indirect impacts from dust and vibrations occur for a short duration (intermittent and only during the construction phase) with mitigation implemented in accordance with the CEMP.
National and European heritage	Minor direct impact to 'Dampier Archipelago (including Burrup Peninsula)' National Heritage Place (Place No. 105727) / municipal heritage site (ID: 25086), including terrestrial and inter-tidal zones. Aboriginal heritage values of the listing (terrestrial base values) are protected by Horizon Power's commitment to avoid direct impacts to known Aboriginal Heritage sites within or adjacent to the DE. Indirect impacts adequately managed in accordance with the CEMP.
Amenity – visual	Long-term minor impacts to visual amenity. Impacts are consistent with the industrial land use proposed within the Burrup SIA. Impacts are adequately mitigated through Proposal design (restricted pole height), and DE alignment with existing service corridors.
Amenity – noise, dust, vibrations	Short-term minor impacts to amenity from noise, dust and vibrations are adequately managed through the CEMP.
Nature reserves	No direct impact to Murujuga National Park.

6.4 Other environmental factors

The following additional environmental factors relevant to the Proposal have been identified and are discussed below:

- Greenhouse Gas (GHG) Emissions;
- Air Quality;
- Inland Waters;
- Terrestrial Environmental Quality;
- Coastal Processes; and
- Marine Environmental Quality.

Table 6-22 provides a summary of the impacts, mitigations and outcomes for these factors.

Table 6-22 Other environmental factors relevant to the Proposal

Factor	Policy and Guidance	Receiving Environment	Potential Impacts	Mitigation	Outcomes
Greenhouse Gas (GHG) Emissions	Environmental Factor Guideline – Greenhouse Gas Emissions (EPA 2020c)	The Dampier township is located 1.5 km west of the DE.	A detailed assessment of GHG emissions (scope 1, 2 and 3) generated during construction and operation of the Proposal is provided as Appendix 8. The report details the assessment boundaries, methodologies employed and assumptions underlying the emissions inventory presented. Total GHG emission from construction for the Proposal have been estimated to be 3,176 tCO2-e, with approximately 48% of total emissions being attributed to embodied emission in construction materials. Lost carbon sink from vegetation clearing and fuel consumption contributed to approximately 43% combined. Total GHG emission from operation and maintenance for the Proposal have been estimated to be 1,659 tCO2-e, with approximately 98% of total emissions being attributed to transmission and distribution losses. Operational GHG emissions have been	The following measures will be implemented to mitigate GHG emissions: • Source construction materials with a lower emissions footprint where available, suitable and practicable; • Vehicle selection will take into account fuel consumption efficiency, whilst allowing operational efficiency; • Ongoing maintenance of vehicles to ensure efficient fuel use; and • Minimise clearing of vegetation where possible.	The Proposal is unlikely to result in a significant residual impact on GHG emission factor and is not considered to require a GHG management plan given operational emissions are well below (1.6%) of the safeguard threshold (100,000 t CO_2-e/yr). Therefore, the Proposal is expected to meet EPA's objective for GHG Emissions.

Factor	Policy and Guidance	Receiving Environment	Potential Impacts	Mitigation	Outcomes
			attributed over a 50 year asset life. Operational GHG emissions generated by the Proposal are well below the 100,000 t CO_2-e/yr threshold.		
Air Quality (dust)	Environmental Factor Guideline – Air Quality (EPA 2020b)	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.	Fugitive dust may be generated from vehicle movements, clearing and construction activities, having a temporary and localised impact on air quality. The majority of dust is expected to be generated during the construction phase. Operational activities for the Proposal include maintenance inspections along the transmission line route, with vehicles restricted to the cleared access tracks. Operation of the Proposal is not expected to produce significant dust emissions.	The following measures will be implemented to mitigate air quality impacts from dust generated during operation of the Proposal: • Implementation of the CEMP will ensure that potential dust sources are managed appropriately and receptors (i.e. construction workforce) are adequately protected from short-term exposure.	The Proposal will not cause significant impacts to air quality given the transient and localised nature of dust generation mostly limited to the construction phase, combined with an absence of sensitive receptors proximal to the DE. Implementation of the CEMP is considered adequate to manage any potential impacts to air quality from dust. Therefore, the Proposal is expected to meet EPA's objective for Air Quality.
Inland Waters	Environmental Factor Guideline – Inland Waters (EPA 2016b)	No permanent water bodies are located within the DE, however numerous drainage lines dissect the DE.	Construction of Proposal infrastructure in drainage lines has the potential to interrupt natural drainage pathways. Construction of the Proposal may have a minor and temporary impact on the quality of inland waters as a	The following measures will be implemented to mitigate impacts to inland waters: • The Proposal infrastructure, including poles and access tracks, will be positioned to avoid direct impact to	The Proposal will not cause significant impacts to inland waters (surface and groundwater) given the mitigation approach (avoidance first) and short term, minor nature of construction and operational activities.

Factor	Policy and Guidance	Receiving Environment	Potential Impacts	Mitigation	Outcomes
		The DE lies in Pilbara proclaimed groundwater area.	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 the construction phase. 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 installing pole footings. If groundwater is encountered, the proposed mitigation is considered adequate to manage temporary impacts. Operational activities for the Proposal include maintenance inspections along the transmission line route. Operation of the Proposal will be restricted to cleared access tracks and is not expected to impact drainage lines or other	drainage lines and the associated surface water flows; • Implementation of CEMP to prevent chemical/ hydrocarbon leaks and spills and prescribe corrective actions in the event of accidental releases; and • In the event that groundwater is encountered, water will be collected in a temporary sump to evaporate/infiltrate or pumped into a truck for offsite disposal.	Impacts to groundwater are not anticipated, however, if encountered dewatering activities will be of a minor and temporary nature. Therefore, the Proposal is expected to meet EPA's objective for Inland Waters.

Factor	Policy and Guidance	Receiving Environment	Potential Impacts	Mitigation	Outcomes
			water features located within the DE.		
Terrestrial Environmental Quality	Environmental Factor Guideline – Terrestrial Environmental Quality (EPA 2016c)	Acid Sulfate 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 of the DE (approximately 15.50 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 (ASRIS 2022). A search on the DWER Contaminated Sites Database was conducted to identify the presence or absence of contaminated sites within the DE. The search identified no contaminated sites on, or in close proximity to the DE. It is considered unlikely that contaminating activities have occurred within the	Potential impacts to Terrestrial Environmental Quality from construction of the Proposal include: • Exposure of ASS by ground disturbing activities (i.e. subsurface disturbance associated with construction of pole footings); • It is not expected that groundwater would be encountered when installing pole footings. However, if groundwater is encountered, short-term dewatering of potentially acidic groundwater would be required; • Soil erosion from clearing, earthworks and vehicle/machinery movement; • Soil contamination from accidental release of chemicals and/or hydrocarbons (i.e. leaks, spills) particularly during the construction phase.	The following measures will be implemented to mitigate impacts to Terrestrial Environmental Quality during construction: • Avoid, where possible, placing poles in areas mapped as 'high' probability of ASS occurrence; • In the event that groundwater is encountered, water will be collected in a temporary sump to evaporate/infiltrate or pumped into a truck for offsite disposal; • 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	The Proposal will not cause significant impacts to Terrestrial Environmental Quality given the flexibility to adjust Proposal design to minimise impacts, the short-term nature of construction activities, the limited quantities of contaminants handled on site, and the implementation of listed controls in accordance with the mitigation hierarchy. The release of potentially acidic groundwater is not anticipated, however, if dewatering of groundwater is required any potential short-term impacts can be adequately managed with the proposed controls. Therefore, the Proposal is expected to meet EPA's objective.

Factor	Policy and Guidance	Receiving Environment	Potential Impacts	Mitigation	Outcomes
		DE given the remote location.	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. Operational activities for the Proposal include maintenance inspections along the transmission line route. Operation of the Proposal will be restricted to cleared access tracks and is not expected to impact Terrestrial Environmental Quality.	waste, and prescribe corrective actions in the event of accidental releases.	
Coastal Processes	Environmental Factor Guideline – Coastal Processes (EPA 2016f)	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	The Proposal is not expected to impact upon Coastal Process during construction, given the limited timeframe required and the implementation of a CEMP. Construction of the Proposal is not expected to impact drainage patterns, water levels, wave energy or currents within	The following measures will be implemented during construction and operation to mitigate impacts to Coastal Processes: • Minimise the number of poles required within the tidal inlet as far as possible;	The Proposal is not expected to cause significant impacts to coastal processes, given the proposed design mitigation, rehabilitation, and construction and operational management. The Proposal will be designed to have a minimal impact to the tidal inlet between Hearson Cove and King Bay. The

Factor	Policy and Guidance	Receiving Environment	Potential Impacts	Mitigation	Outcomes
		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. Potential impacts to coastal processes may occur during operation of the Proposal, through: • Poles required for the transmission line located within the tidal inlet; and • Alteration of drainage patterns, water levels, wave energy or currents within the tidal inlet.	• The construction of access tracks within the tidal inlet between Hearson Cove and King Bay, will be avoided as far as practicable, to minimise clearing and ground disturbance • Implementation of CEMP to manage and mitigate vegetation clearing, erosion and sedimentation and contamination during construction.	indicative disturbance footprint includes only one pole and pole pad within this area (refer to Figure 2-2). The construction of access tracks within the tidal inlet will be avoided if possible. Given the minimal disturbance required for the Proposal within the tidal inlet between Hearson Cove and King Bay, no significant impacts to drainage patterns, water levels, wave energy or currents is expected. Therefore, the Proposal is expected to meet EPA's objective.
Marine Environmental Quality	Environmental Factor Guideline – Marine Environmental Quality (EPA 2016f)	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	The Proposal may impact Marine Environmental Quality within the tidal inlet during construction, through the following: • Loss of intertidal adapted vegetation up to 2.50 ha; • Exposure of ASS by ground disturbing activities (i.e. subsurface disturbance associated with construction of pole footings); • Soil erosion from clearing, earthworks and	The following measures will be implemented during construction and operation to mitigate impacts to Marine Environmental Quality within the tidal inlet: • Minimise the number of poles required within the tidal inlet as far as practicable; • The construction of access tracks within the tidal inlet between Hearson Cove and King Bay, will be avoided as	The Proposal is not expected to significantly impact Marine Environmental Quality within the tidal inlet during construction of the Proposal, given the flexibility to adjust Proposal design to minimise impacts, the short-term nature of construction activities, the limited quantities of contaminants handled on site, and the implementation of listed controls in accordance with the mitigation hierarchy.

Factor	Policy and Guidance	Receiving Environment	Potential Impacts	Mitigation	Outcomes
		then retracts to several small pools and a minor drainage line during the low period. The majority of the tidal inlet comprises intertidal flats with sand and mud being common. The tidal inlet between Hearson Cove and King Bay is also mapped as having a has a high probability of ASS occurrence.	vehicle/machinery movement; • Soil contamination from accidental release of chemicals and/or hydrocarbons (i.e. leaks, spills) particularly during the construction phase. 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. Operational activities for the Proposal include maintenance inspections along the transmission line route. Operation of the Proposal will be restricted to cleared access tracks and is not expected to impact Marine Environmental Quality.	far as practicable, to minimise clearing and ground disturbance; • Avoid, where possible, placing poles in areas mapped as 'high' probability of ASS occurrence; • 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 CEMP will be implemented during construction to mitigate and manage the clearing of intertidal vegetation, excavation of ASS, soil erosion and sediment discharge, contamination and accidental spills. Implementation of the CEMP is considered adequate to manage any potential impacts to Marine Environmental Quality arising from construction of the Proposal. Therefore, the Proposal is expected to meet EPA's objective for Marine Environmental Quality.

7 Offsets

The Proposal will not result in any significant residual impacts to environmental factors. An offset strategy is not proposed as management and mitigation measures developed are expected to adequately manage implementation of the Proposal.

8 Matters of National Environmental Significance

8.1 Controlled Action Provisions

Horizon Power is intending to refer the Proposal to the Commonwealth DCCEEW under the EPBC Act as a result potential impact to MNES. These impacts are due to the clearing of fauna habitat that is suitable habitat for Threatened and Migratory fauna. In addition, the Proposed Action will require disturbance and construction activities within a National Heritage Place (namely, the Dampier Archipelago [including Burrup Peninsula])

Referral to DCCEEW will be undertaken concurrent to the Section 38 referral. Should the Proposal be determined a controlled action, Horizon Power would request that the EPBC Act assessment approach be an 'accredited assessment' of MNES to be undertaken as part of the EPA assessment of the Proposal. The EPA assessment will then inform a decision by the Federal Minister for Environment and conditions for the Proposal under the EPBC Act.

8.2 Policy and Guidelines

MNES are listed and protected under the following legislation and guidelines:

- *Environment Protection and Biodiversity Conservation Act 1999*;
- Environment Protection and Biodiversity Conservation Regulations 2000; and
- Significant Impact Guidelines (No. 1.1): Matters of National Environmental Significance (DoE, 2013).

8.3 Summary of existing environmental values and potential impacts on MNES

A number of desktop and field surveys have been undertaken for the Proposal in order to assess the presence of MNES within the DE, which may trigger the requirement for referral The presence of MNES within the DE has been summarised in Table 8-1. If needed, Horizon Power will undertake additional surveys and assessments during the referral process to further define impacts to MNES as a result of the Proposal.

Extensive consideration has been made during the alignment selection and the design refinement process to avoid impacts on MNES. Horizon Power will continue to refine the design during the assessment process to further reduce and avoid these impacts.

Table 8-1 Matters of National Environmental Significance within the DE

MNES	Impact of the Proposal
National Heritage Places	The DE intersects the Dampier Archipelago (including the Burrup Peninsula) National Heritage Place (Place Id 105727). Refer to Section 6.3.2.4.1.
Listed Threatened Ecological Communities	Surveys did not record the presence of any TECs within the DE (see Section 6.1.2.3)
Listed Threatened Flora	Surveys did not identify the presence of any Threatened flora species within the DE (see Section 6.1.2.4). A likelihood of occurrence assessment concluded that no Threatened flora species are considered possible to occur within the DE.
Listed Threatened Fauna Species	The Proposal will require the clearing of vegetation that is suitable habitat for fauna species that are listed as MNES under

MNES	Impact of the Proposal
	the EPBC Act. No Threatened fauna species were recorded within the DE during the surveys, however, two Threatened fauna species have the potential to occur within the DE (see Section 6.2.2.3.2). These species include the Northern Quoll and Pilbara Olive Python.
Listed Migratory Species	The Proposal will require the clearing of vegetation that is suitable foraging habitat for migratory species that are listed as MNES under the EPBC Act. One migratory species, the Whimbrel, was recorded within the DE. An additional twelve migratory species have the potential to occur within the DE (see Section 6.2.2.3.2).

As detailed in Table 8-1, one National Heritage Place and one migratory species were recorded within the DE. An additional two Threatened fauna species and twelve migratory species have the potential to occur within the DE.

8.4 Mitigation measures

Mitigation measures to address potential impacts on MNES are outlined in the relevant sections for each environmental factor in this document. If required, additional mitigation measures will also be developed by Horizon Power throughout the assessment process.

8.5 Predicted outcomes

The Proposal is not expected to have a significant impact on any listed MNES known, or with the potential to occur within the DE. The Proposal is not considered to be a controlled action under the EPBC Act.

9 Holistic impact assessment

The EIA process needs to consider the benefits and impacts of the Proposal in a holistic manner. Where the combination of two or more environmental factors has the potential to result in a significant impact, a holistic impact assessment should consider the interconnectedness of the assessed environmental factors through the application of the EPA's objectives for environmental factors.

The environmental surveys and studies undertaken for the Proposal have considered and assessed potential impacts at both a local and regional scale. The results of these surveys have informed the Proposal impact assessment and mitigation measures.

While the Proposal's predicted outcomes have been considered independently in relation to the environmental principles and the EPA's environmental objectives for each preliminary environmental factor, Horizon Power recognises the complex linkages between Flora and Vegetation, Terrestrial Fauna and Social Surroundings. These complex linkages and connections between parts of the environment have been portrayed in Figure 9-1 to inform the Proposal's holistic impact assessment.

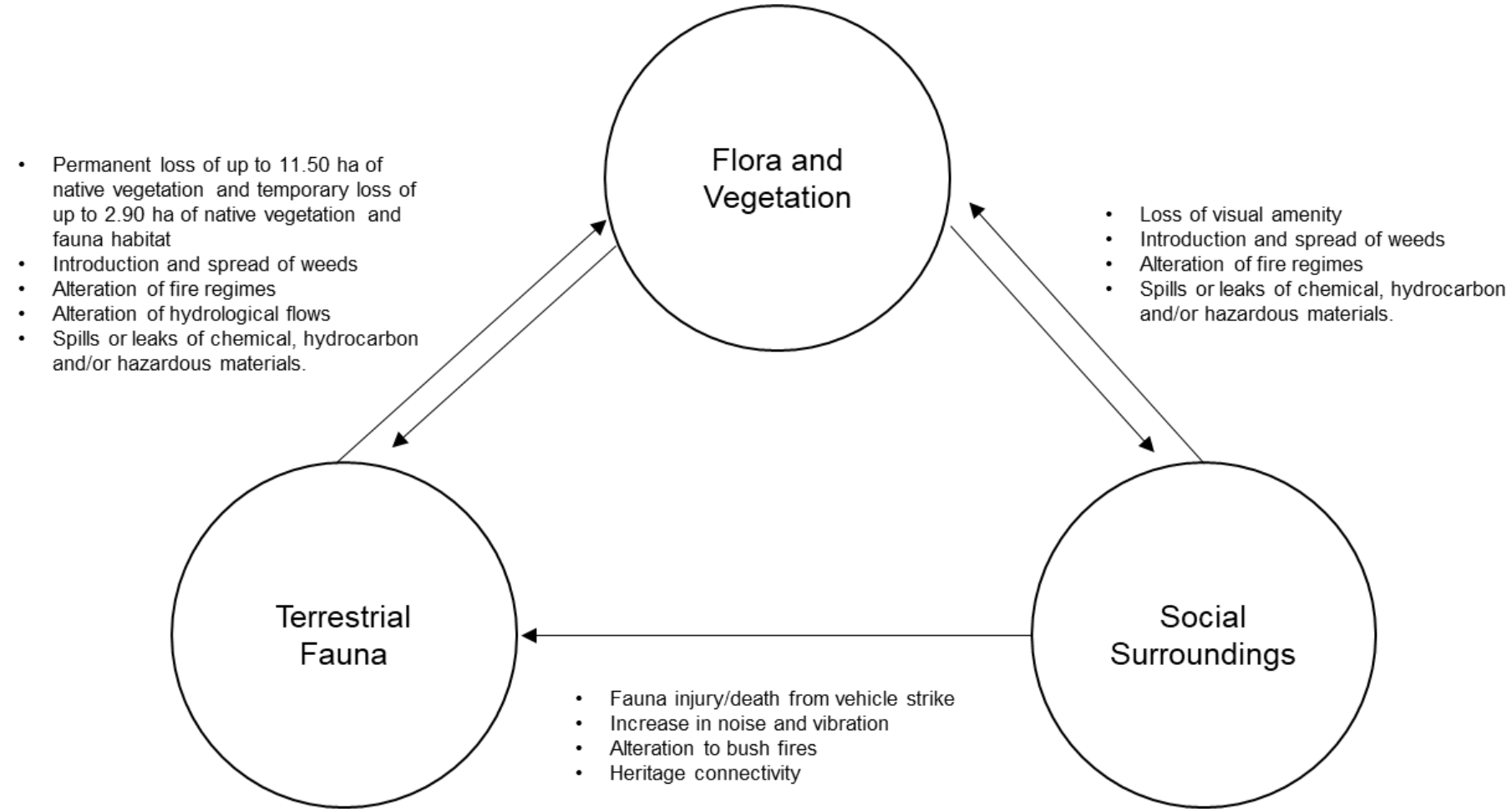

Figure 9-1 Intrinsic interactions between key environmental factors

9.1 Vegetation and flora

Potential permanent impacts to vegetation and flora from implementation of the Proposal are limited to areas of construction required for the following infrastructure/activities:

- Construction and installation of an 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;
- Construction and operation of the Burrup substation;
- Construction of the Dampier substation expansion; and
- Construction and installation of associated electrical infrastructure such as ring main units and transformers.

Temporary impacts will also occur to vegetation and flora as a result of the Proposed Action. These impacts are associated within the following activities:

- 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.

Vegetation and flora within the DE have been historically impacted by the presence of the existing Burrup Road and surrounding land uses. However, there are areas of the DE in Very Good to Excellent condition, which were completely undisturbed (i.e. no access tracks, existing power lines or exploration).

The Proposal will utilise existing cleared areas and roads where possible. Design of the Proposal also utilises the proposed Burrup Road realignment (to be implemented by Main Roads), reducing the amount of clearing required for access tracks in this area. The Proposal requires the removal of up to 14.40 ha of native vegetation. Of this, up to 2.90 ha is required for temporary activities and will be rehabilitated upon completion of construction. The clearing of native vegetation required for the Proposal includes up to 2.50 ha of riparian vegetation and up to 1.50 ha of vegetation located within the tidal inlet between Hearson Cove and King Bay. The Proposal also requires the removal of up to 19 individuals of *Terminalia supranitifolia* (Priority 3) and up to six individuals of *Rhynchosia bungarensis* (Priority 4).

Through the clearing of native vegetation, the Proposal has the potential to impact on terrestrial fauna by removing and altering fauna habitats potentially suitable for significant fauna species. Clearing of vegetation and alteration to the natural landscape has the potential to reduce visual amenity and impact social surroundings.

The impact on flora and vegetation is unlikely to be significant and the Proposal will not result in any residual significant impacts.

9.2 Terrestrial fauna

Similar to flora and vegetation impacts, potential impacts to terrestrial fauna will result primarily from permanent and temporary activities required to implement the Proposal. Fauna habitats within the DE range from moderate to high value and are suitable for eighteen fauna species with the potential to occur within the DE.

The Proposal will utilise existing cleared areas and roads to minimise impacts to fauna habitats where possible. The Proposal will impact on terrestrial fauna through clearing of up to 14.40 ha of fauna habitat. Of this, up to 2.90 ha is required for temporary activities and will be rehabilitated upon completion of construction. Clearing of vegetation required for the Proposal has the potential to impact terrestrial fauna, through the removal of fauna habitat. Indirect impacts resulting from the Proposal, such as the introduction and spread of weeds, changes to hydrological flows and alteration of fire regimes, has the potential to impact terrestrial fauna through the degradation of suitable fauna habitat. In addition, removal of fauna habitat has the potential to impact social surroundings through alteration of the natural landscape and restricted access to recreational areas.

Having considered the historical and cumulative impacts to fauna habitats in the vicinity of the Proposal, Horizon Power does not expect any significant residual impacts to result from the Proposal. By applying the proposed mitigation and management measures detailed throughout the referral and within the CEMP, Horizon Power considers that the impacts to the health and integrity of other environmental factors including flora and vegetation and social surroundings are likely to be consistent with the EPA's environmental factor objectives.

9.3 Social surroundings

Direct impacts to Aboriginal cultural heritage values within the DE have been avoided. Implementation of the Proposal will not directly impact upon known Aboriginal cultural heritage. In addition, the proposed World heritage nomination has been considered during the design of the Proposal, with the Proposal being designed to avoid impacts to known heritage values.

Noise and vibration may be a nuisance during construction to nearby sensitive receivers, however these impacts will be short lived and temporary. In addition, the nearest sensitive receptors are located approximately 1.5 km west within the Dampier town. Noise mitigation measures will be implemented for the construction of the Proposal, as outlined in the CEMP (Appendix 1). Operational noise is not expected to be significant, given that operational activities consist of maintenance inspections along the route.

The Proposal's impact on flora and vegetation and terrestrial fauna has the potential to impact on social surroundings through the loss of the natural landscape, restricted access to recreational areas and reduced visual amenity. However, no significant residual impacts are expected, and Horizon Power considers the EPA objective for social surroundings will be met.

By applying the proposed mitigation and management measures for impacts to social surroundings, Horizon Power considers that impacts to the health and integrity of flora and vegetation, terrestrial fauna and inland waters are likely to be consistent with the EPA's environmental factor objectives.

10 Cumulative environmental impact assessment

Cumulative effects to the environment result from multiple activities whose direct impacts may be relatively minor, but in combination with other activities can result in significant environmental and social effects. Cumulative impacts resulting from the Proposal for each preliminary key environmental factor are summarised in the following section.

The cumulative impact assessment presented considers the Proposal and NVCP's identified in Section 2.4.8, which include Proposals located on the Burrup Peninsula (within the Burrup SIA), and approved NVCP's that are located within 10 km of the Proposal. Horizon Power is also aware of a number of Proposals and developments that are currently in the design and/or planning phase, and that are located in proximity to this Proposal. However, as these Proposals have not yet been approved or submitted for approval, they are considered to be speculative and conceptual in nature and as such they have not been considered within the CIA.

When calculating cumulative impacts to flora and vegetation and terrestrial fauna, Proposals constructed prior to 2018 (prior to the latest Statewide Vegetation Statistics update) have not been considered, as clearing impacts have already been accounted for within the Statewide Vegetation Statistics.

Proposals constructed prior to 2018 include:

- Woodside Energy Ltd – Karratha Gas Plant;
- Yara Pilbara Fertilisers Pty Ltd – Liquid Ammonia Plant;
- Woodside Energy Ltd – Pluto LNG Development; and
- Yara Pilbara Nitrates Pty Ltd [initially referred by Burrup Nitrates Pty Ltd] – Technical Ammonium Nitrate Production Facility.

Proposals constructed after 2018 (or Proposals yet to be constructed) include:

- Yara Pilbara Fertilisers Pty Ltd – Ammonia Plant and Renewable Hydrogen Project;
- AGI Operations Pty Ltd – Pluto North West Shelf Interconnector Pipeline;
- Perdaman Chemicals and Fertilisers Pty Ltd – Perdaman Urea Project; and
- Woodside Energy Ltd – North West Shelf Project Extension (approval pending, no additional clearing impacts).

All above listed Proposals have been considered within the CIA for social surroundings (NVCP's are not considered relevant to the EPA's factor social surroundings).

10.1 Flora and vegetation

Cumulative impacts for environmental factor flora and vegetation, relevant to the Proposal, are listed in Table 10-1 and summarised as follows:

- Implementation of the current Proposal as well as other Proposals listed in Table 6-6 will result in the combined removal of up to approximately 127.09 ha native vegetation (in varying condition) present on the Burrup. With the incorporation of the approved NVCPs located within a 10 km radius of the Proposal, the total clearing area of native vegetation is approximately 1,432.89 ha. The vegetation types (and broad vegetation complexes) recorded within the Proposal DE are not restricted to the local area.

- Clearing associated with all Proposals listed on Table 6-6 will result in a combined impact of 54.09 ha of Vegetation Association 117. The current Proposal 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).
- In total the Proposals listed in Table 6-6 will clear up to 0.18 ha of Burrup Peninsula rock pile communities PEC. However, the current Proposal is not expected to impact the rock pile communities (impact to rock pile communities within the DE will be avoided unless unexpectantly constrained by a heritage find during preliminary ground disturbance).
- The current Proposal will directly impact riparian vegetation resulting in a loss of up to 2.50 ha. The other Proposals listed in Table 6-6 will not impact riparian vegetation, therefore no additional foreseeable impacts on riparian vegetation are anticipated.
- The Proposals listed in Table 6-6 will together clear approximately 9.36 ha of locally significant native vegetation present, with the current Proposal clearing up to 1.50 ha.
- The current Proposal, along with other Proposals listed in Table 6-6 will result in combined reduction of up to 25 individuals of *Terminalia supranitifolia* (P3), and up to 18 individuals of *Rhynchosia bungarensis* (P4).

Table 10-1 Flora and vegetation cumulative impacts relevant to Proposal

Aspect	Cumulative environmental impacts
Environmental factor – flora and vegetation	
Proposed vegetation clearing	Proposals combined clearing: 127.09 ha Incorporating approved NVCPs: 1,432.89 ha.
Pre-European complexes affected	Proposals combined clearing of up to 54.09 ha Vegetation Association 117.
Significant vegetation affected	• Combined clearing/removal of up to 0.18 ha Burrup Peninsula rock pile communities PEC; • Combined clearing of up to 2.50 ha of riparian vegetation; and • Combined clearing of up to 9.36 ha of locally significant native vegetation.
Significant flora affected	• Combined clearing of up to 25 individuals of *Terminalia supranitifolia* (Priority 3); and • Combined clearing of up to 18 individuals of *Rhynchosia bungarensis* (Priority 4).

10.2 Terrestrial fauna (including SRE)

Cumulative impacts for environmental factor terrestrial fauna, relevant to the Proposal, are listed in Table 10-2 and summarised as follows:

- Implementation of the current Proposal as well as other Proposals listed in Table 6-14 will together:
    - Result in the loss of up to 54.58 ha of fauna habitat in varying condition. Incorporation of the approved NVCPs within a 10 km radius of the Proposal will result in the total clearing of 1,405.38 ha of potential fauna habitat. The

fauna habitat types recorded within the DE are not restricted to the local area.

- Impact up to 23 conservation significant fauna species. Of these, Northern Quoll and Pilbara Olive Python have been recorded in the current Proposal DE.
- Have no impact to the Priority 1 Ecological Community Rockpools of the Burrup Peninsula (significant habitat for SRE species) (impact to the P1 PEC within the current Proposal DE will be avoided unless unexpectantly constrained by a heritage find during preliminary ground disturbance).

Table 10-2 Terrestrial fauna cumulative impacts relevant to Proposal

Aspect	Cumulative environmental impacts
Environmental factor – terrestrial fauna	
Proposed fauna habitat clearing	Proposals combined clearing: 54.58 ha Incorporating approved NVCPs: 1,405.38 ha.
Significant fauna species and habitats affected	• Up to 23 significant fauna species impacted; • Potential impact to up to 8 habitat types; and • No impact to SRE species.

10.3 Social surroundings

Cumulative impacts for environmental factor social surroundings, relevant to the Proposal, are summarised as follows:

- The current Proposal will avoid direct impacts to known Aboriginal cultural heritage. As such the current Proposal will not contribute to cumulative impacts on Aboriginal cultural heritage and values on the Burrup Peninsula.
- The current Proposal will also avoid impacts to the proposed World heritage nomination, through the avoidance of impacts to known heritage values.
- Implementation of the current Proposal will result in disturbance of land within the Dampier Archipelago (including Burrup Peninsula) National and European heritage place. Other Proposals (existing and proposed) on the Burrup Peninsula are situated within designated development sites in the Burrup SIA (Development WA, 2021) and accordingly are located outside of the mapped extent of the Dampier Archipelago (including Burrup Peninsula) National and European heritage place. Hence the cumulative impact from other Proposals on the Dampier Archipelago will be negligible.
- The current Proposal, and other Proposals in the surrounding area (both existing and proposed), will have a cumulative impact on visual amenity of the immediate surrounding area. However, all Proposals are located in the Burrup SIA zoned for industrial use. Further the current Proposal DE has been positioned to align with existing services (i.e. water, roads) to minimise the extent of visual amenity impacts. Due to the nature of infrastructure proposed, the Proposal is expected to have a negligible impact on visual amenity.

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12 Appendices

Appendix 1: Construction Environmental Management Plan

Appendix 2: Land Tenure

Appendix 3: Woodside Power Project Flora and Vegetation Surveys Desktop Assessment Report (VLA 2019)

Appendix 4: Horizon Power 124-KRT-DMP 132kV Line Upgrade Project Flora and Fauna Survey (GHD 2019)

Appendix 5: Horizon Power Burrup Expansion Project Flora and Vegetation Survey (GHD 2020a)

Appendix 6: Additional Areas Reconnaissance/Basic Survey (GHD 2022)

Appendix 7: Woodside Power Pty Ltd Hybrid Renewable Power Plant Fauna Survey (GHD 2020b)

Appendix 8: Greenhouse Gas Assessment Report (Horizon Power 2022)