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PORT HEDLAND SOLAR FARM

NATIVE VEGETATION CLEARING PERMIT APPLICATION
SUPPORTING INFORMATION

25 FEBRUARY 2022

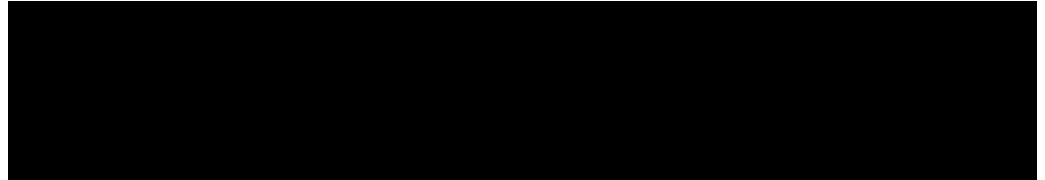
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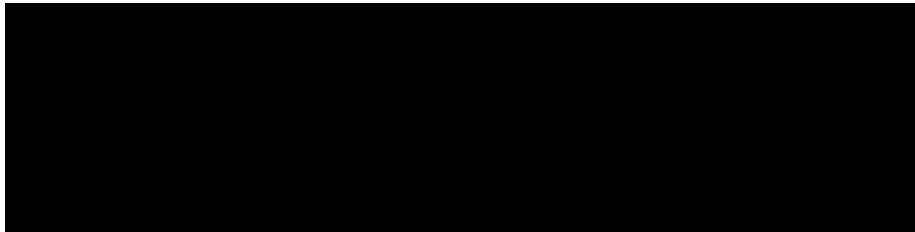
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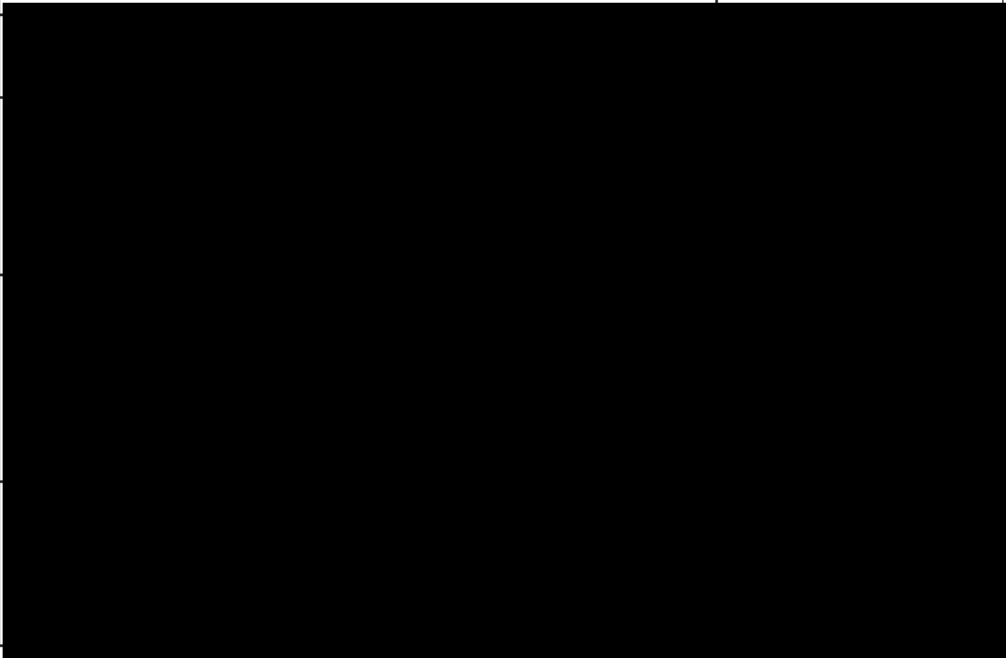
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1 INTRODUCTION

1.1 PROJECT BACKGROUND

Alinta Energy Development Pty Ltd (Alinta) is in the planning phase of the proposed development of a Solar Farm (Port Hedland Solar Farm or, the Project), located seven kilometres (km) southwest of South Hedland in the Pilbara region of Western Australia (WA). The Project will be a new 90 Megawatt (MW) Alternating Current (AC) solar facility situated on Unallocated Crown Land (UCL) near Alinta’s existing Port Hedland Power Station (PHPS). The Project will consist of three 30 MW AC blocks configured as a single facility, two new 33/66 kilovolts (kV) step-up transformers and a short (~2 km) 66 kV double circuit line connection to the existing PHPS 66 kV switchyard. The Project will supply power to the 66 kV PHPS for which Alinta is the network service provider.

The indicative area for the Project is presented in Figure 1 by Section 91 Licence Boundary (Project Area). Geotechnical investigations are required as inputs into the overall feasibility of the Project and to ensure that the design and construction of the foundations for the Project are sound. The geotechnical investigations do not represent implementation of the Project, however it is intended to utilise portions of the proposed clearing for the Project (to minimise the new clearing requirements for the Project). Clearing for the Project is to be carried out under a separate clearing permit or through Part IV approvals. Alinta has been consulting with the Department of Water and Environmental Regulation and Department of Agriculture, Water and Environment regarding referral and assessment of the Project.

1.2 PURPOSE

The purpose of this Native Vegetation Clearing Permit (NVCP) application is to seek permission to clear up to 15 hectares (ha) of native vegetation within the proposed Permit Area (Figure 1) to facilitate required geotechnical work to determine soil structure, composition and stability as part of project feasibility studies.



2 PERMIT AREA

A Purpose Permit is requested for the Permit Area to provide flexibility for test pit and drilling locations and access during the geotechnical investigation program. Ecological surveys have been undertaken over the Permit Area as part of the suite of surveys and studies undertaken for the Project.

2.1 BOUNDARY

Clearing is to be conducted within the boundaries of the Permit Area shown in Figure 1.

Key environmental values were identified in the baseline studies as outlined in Section 4. Alinta is planning to avoid disturbance within the area represented by “Environmental Area” in Figure 1.

2.2 TENURE AND LAND ACCESS

The Permit Area lies entirely within Section 91 (S91) Licence No. 00841/1958_A11289097, which was obtained to enable surveys and investigations on the land associated with the Project. The tenure that underlies the S91 Licence within the Permit Area is UCL.

2.3 NATIVE TITLE

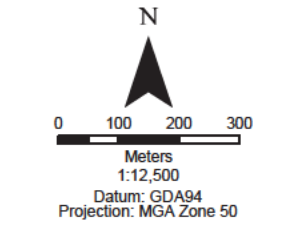
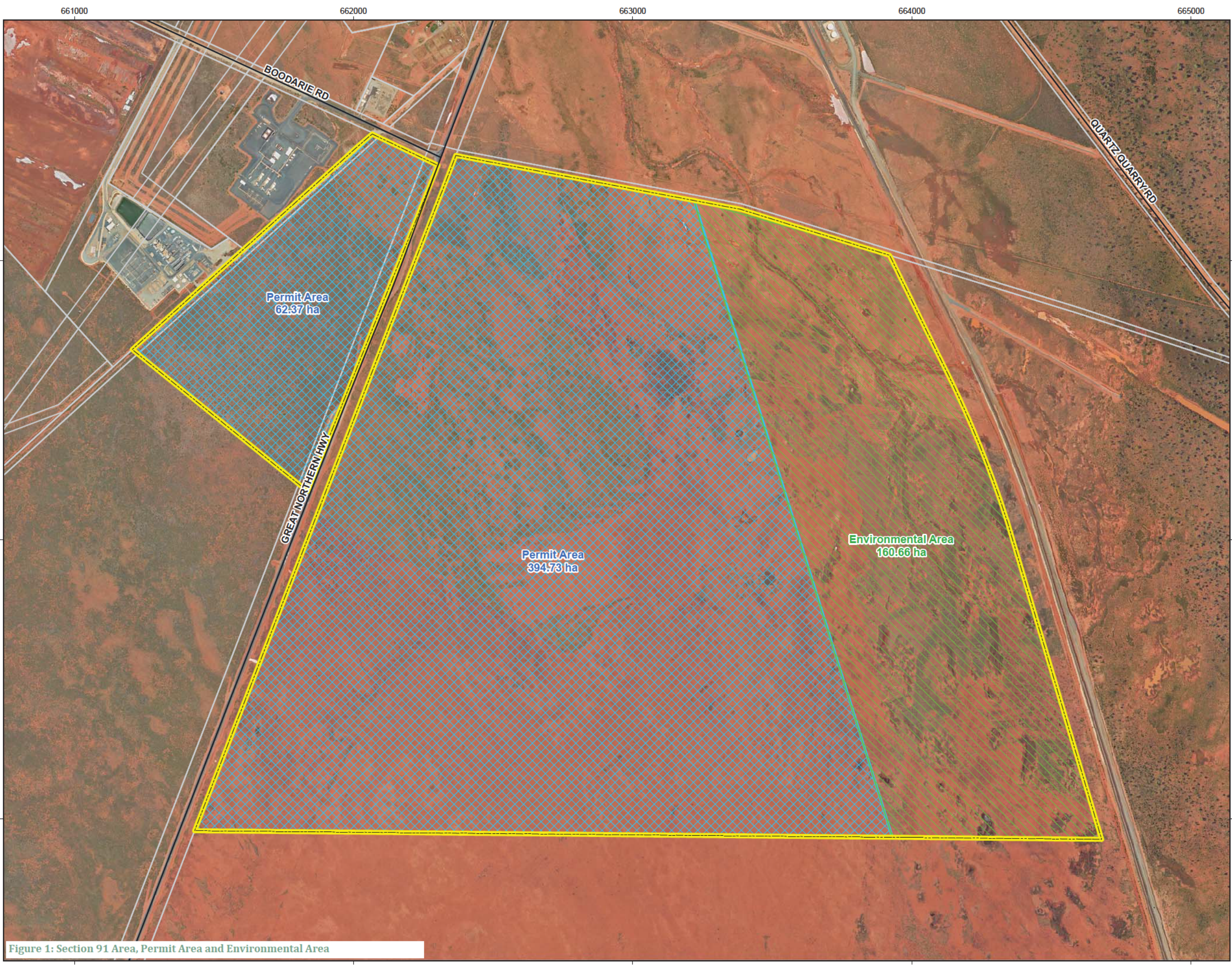
All vegetation disturbance will occur within the Determined Claim Area WAD 6169/1998 of the Kariyarra People. Alinta has an Indigenous Land Use Agreement (ILUA reg. no. WI2018/009) with the Kariyarra People.



Port Hedland Solar

Legend

- Section 91 Licence Boundary
- Proposed**
- Native Vegetation Clearing Permit Area (457.10 ha)
- Environmental Area
- Boundaries**
- Cadastral



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Drawn by:	GSM
Requested by:	SW

Figure 1: Section 91 Area, Permit Area and Environmental Area

3 PROPOSED ACTIVITIES

Clearing is required to facilitate geotechnical work to inform the design of the Project. Geotechnical work will involve the following clearing activities:

- Clearing of drill pads (typically 20 m x 20 m) to allow approximately 30 boreholes to be drilled with a geotechnical site investigation drilling rig;
- Clearing to allow the excavation of approximately 25 test pits across the site to depths of up to 3 m (or shallower if restricted by refusal or collapsing);
- Clearing to allow pile testing (typically 10 m x 10m). A total of 40 pile tests at 20 locations to be determined by Alinta / contractor. The pile test shall be carried out in accordance with AS2159; and
- Access tracks and laydown areas associated with the site activities outlined above.



4 ENVIRONMENTAL CHARACTERISTICS

Environmental characteristics of the Project Area relevant to this NVCP are detailed in the following sections. The Permit Area represents 457.1 ha of the Study Area outlined in Figure 2.

4.1 SURVEY DETAILS

Phoenix Environmental Sciences Pty Ltd (Phoenix) conducted desktop assessments and detailed surveys of the Project Area for flora, vegetation, and terrestrial fauna (Phoenix 2021a, b). The detailed flora and fauna surveys cover the Study Area shown in Figure 2. A desktop assessment was conducted within a 40 km radius of the Study Area to provide regional context for the flora, vegetation and fauna recorded during the field surveys.

A targeted Bilby (Vulnerable (VU); BC and EPBC Act; *Macrotis lagotis*) survey was also conducted by Phoenix to determine the local extent of the population. The survey area for the targeted Bilby survey is shown in Figure 2 (Targeted Survey Area). During this survey, 49 search transects were traversed totalling a combined distance of 123.5 km. As discussed in Section 2, the Permit Area does not intersect with the ‘Environmental Area’ at the eastern portion of the Study Area (Figure 1). There were no limitations identified in the flora and fauna reports.



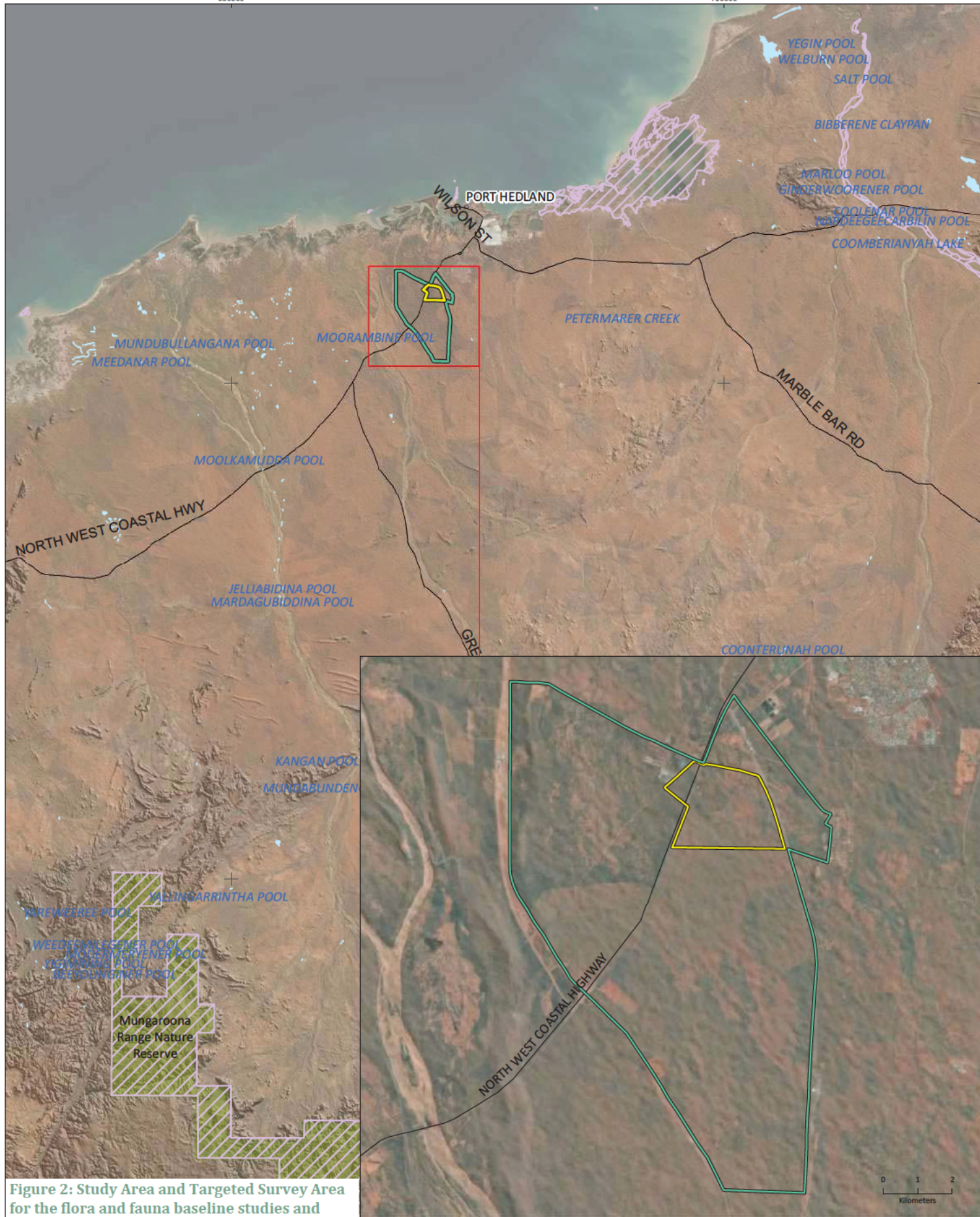


Figure 2: Study Area and Targeted Survey Area for the flora and fauna baseline studies and

<p>Western Australia</p> <p>PERTH</p>	<p>Alinta Energy Pty Ltd via Preston Consulting Port Hedland Solar Farm Project</p>		<p>Study Area</p> <p>Targeted Bilby survey area</p> <p>Environmentally sensitive areas</p> <p>Lake</p> <p>DBCAs managed land</p> <p>Road</p>	<p>PHOENIX ENVIRONMENTAL SCIENCES</p>
	<p>Project No 1454</p> <p>Date 8/11/2021</p> <p>Drawn by IN</p> <p>Map author SP</p>			

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4.2 BIOGEOGRAPHIC REGIONS

The Study Area lies entirely within the Pilbara Bioregion, specifically within the Roebourne Interim Biogeographic Regionalisation of Australia (IBRA) Subregion, bordered by the Chichester IBRA subregion (Figure 3). Subregions have been described in the *Biodiversity Audit of Western Australia's 53 Biogeographical Subregions* (Kendrick & Stanley 2001). The Roebourne subregion covers 2,008,983 ha, and is characterised as:

- Quaternary alluvial and older colluvial coastal and sub-coastal 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; and
- Climate is arid (semi-desert) tropical with highly variable rainfall, falling mainly in summer. Cyclonic activity is significant, with several systems affecting the coast and hinterland annually (May & McKenzie 2003).

4.3 LAND SYSTEMS

The Study Area is entirely within the Uaroo System and represents less than 1% of the 768,100 ha in the Pilbara Bioregion (Figure 4). This land system is characterised by broad sandy plains, pebbly plains and drainage tracts supporting hard and soft spinifex hummock grasslands with scattered *Acacia* shrubs (Schoknecht & Payne 2011).

4.4 PRE-EUROPEAN VEGETATION

Regional scale vegetation mapping by Shepherd et al. (2002) mapped one vegetation association (589) in the Study Area (Table 1; Figure 5). The remaining pre-European extent of vegetation association 589 exceeds 99% and is therefore considered of Least Concern (Department of Biodiversity, Conservation and Attractions (DBCA), 2018). Table 1 describes the pre-European and current extent of vegetation association 589.

Table 1: Statewide extent of pre-European vegetation associations present in the Study Area

Vegetation association	Pre-European extent (ha)	Current extent (ha)	Remaining (%)	Current extent in DBCA lands (%)	% of Study Area
589 - Short bunch grassland - savanna / grass plain (Pilbara) / Hummock grasslands, grass steppe; soft spinifex	728,768.20	724,695.82	99.44 %	2.11 %	100%



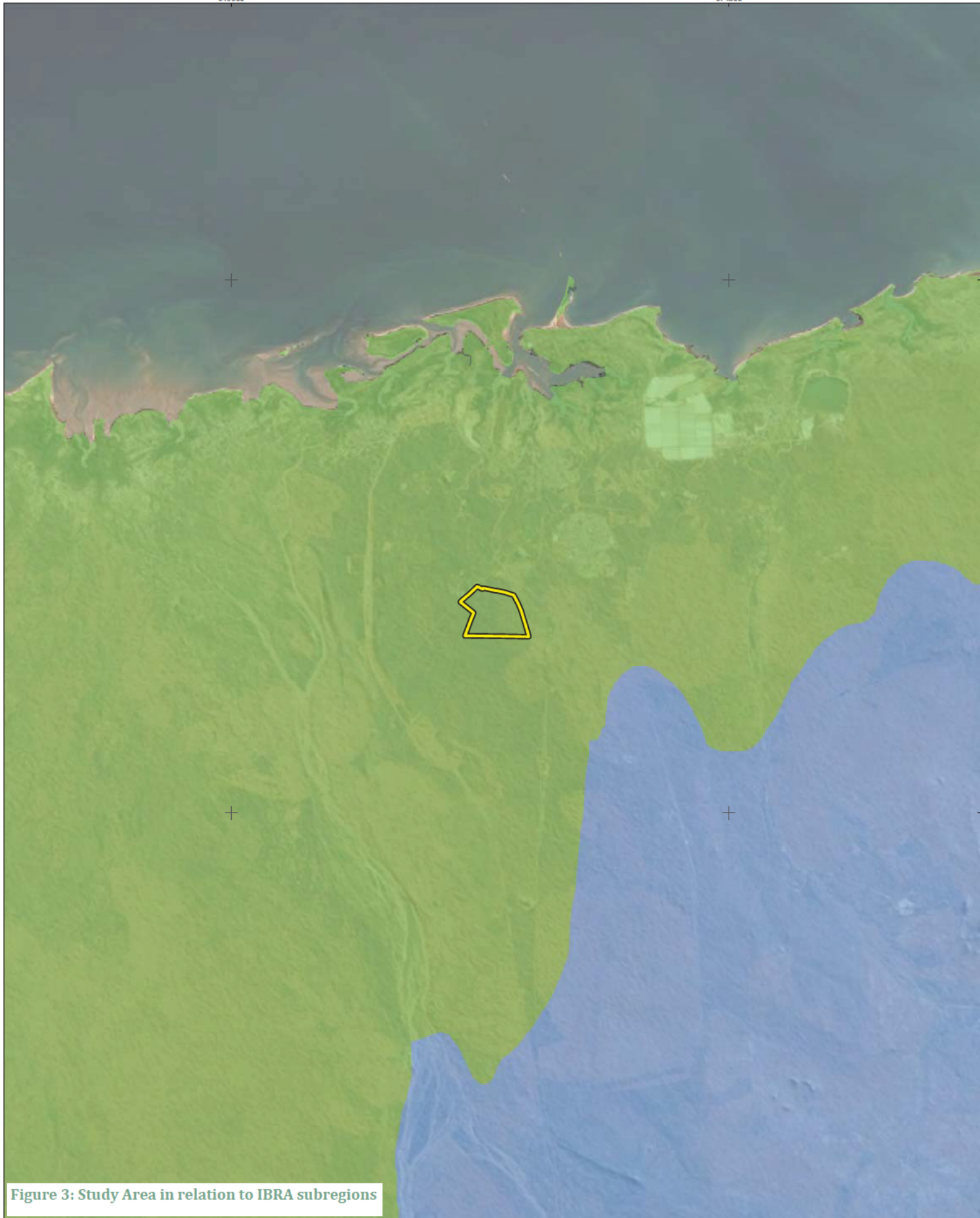


Figure 3: Study Area in relation to IBRA subregions






Alinta Energy Pty Ltd via Preston Consulting
 Port Hedland Solar Farm Project

Project No 1387
 Date 4/02/2021
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 Map author GW



0 5 10
 Kilometers

1:250,000 (at A4) GDA 1994 MGA Zone 50














-  Study area
- IBRA region and subregion**
-  Pilbara, Chichester
-  Pilbara, Roebourne

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Figure 4: Land systems and surface geology in the Study Area.

 <p>Western Australia PERTH</p>	<p>Alinta Energy Pty Ltd via Preston Consulting Port Hedland Solar Farm Project</p> <p>Project No 1387 Date 4/02/2021 Drawn by IN Map author GW</p>		 Study area	<p>Surface geology</p>
	<p>0 1 2 Kilometers</p> <p>1:80,000 (at A4) GDA 1994 MGA Zone 50</p>	<p>Land system</p> <ul style="list-style-type: none">  Littoral System  Mallina System  River System  Uaroo System 	<ul style="list-style-type: none">  Qa  Qdc  Qe  Qtm  water 	 <p>PHOENIX ENVIRONMENTAL SCIENCES</p>

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0 1 2
 Kilometers

1:100,000 (at A4) GDA 1994 MGA Zone 50

Study Area

Figure 4: Land systems and surface geology in the Study Area.

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4.5 FLORA AND VEGETATION

4.5.1 LISTED FLORA

Initial desktop studies conducted by Phoenix identified 14 individual listed flora species recorded within a 40 km radius of the Study Area. This comprised one Threatened (T) flora species listed under both the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act; Cth) and *Biodiversity Conservation Act 2016* (BC Act; WA). 13 Priority (P) flora species were also recorded. None of these records occurred in the Study Area. An assessment of the likelihood of each of these 14 species occurring in the Study Area was also undertaken. Eight species were considered to possibly occur and six considered unlikely to occur. The eight species identified as possibly occurring and their conservation status are:

- *Seringia exastia* (T, BC Act; EPBC Act);
- *Tephrosia rosea* var. Port Hedland (A.S. George 1114; P1);
- *Abutilon* sp. *Pritzelianum* (S. van Leeuwen 5095; P3);
- *Gomphrena leptophylla* (P3);
- *Heliotropium muticum* (P3);
- *Rothia indica* subsp. *Australis* (P3);
- *Eragrostis crateriformis* (P4); and
- *Goodenia nuda* (P4).

The desktop review identified the Threatened species *Seringia exastia* as possibly occurring within the Study Area, however it was not found in either of the field surveys. *S. exastia* is due to have its conservation status removed under the BC Act after a recent taxonomic study assessed genomic and morphological characters in several *Seringia* taxa and discovered that *S. exastia* is synonymous with *S. elliptica* (Binks et al. 2020). Given that *S. elliptica* is common and widespread throughout the Pilbara and beyond, following taxonomic revision, *S. exastia* will be considered common and widespread too (Phoenix, 2021a).

Of the remaining seven Priority flora identified as possibly occurring within the Study Area, six have 21 or more records and/or occur across several bioregions and subregions and/or have large population records. Therefore, any records of the species that may be within the Study Area are unlikely to represent a substantial proportion of the total population for these species.

4.5.2 RECORDED SIGNIFICANT FLORA

No Threatened or Priority flora were recorded during the field surveys.

A solitary plant of one taxon, *Phyllanthus* sp. Port Hedland Solar Farm was collected along the minor drainage line to the east side of the Study Area (within the Environmental Area) during the first field survey (Figure 6). A thorough search of the length of the creek within the Study Area failed to locate any further individuals. The second field survey also failed to locate any further individuals of *Phyllanthus* sp. Port Hedland Solar Farm. The taxon is unnamed and as such is considered locally significant as a novel species. *Phyllanthus* sp. Port Hedland Solar Farm closely resembles *Phyllanthus* sp. B Kimberley Flora that is known from two records (WA Herbarium 1998-) each associated with riparian vegetation. *Phyllanthus* sp. Port Hedland Solar Farm also






resembles three unnamed *Phyllanthus* specimens housed at the Western Australian Herbarium. Review of the records of these specimens (WA Herbarium 1998) determined two occur in the Pilbara bioregion and one in the Great Sandy Desert. All of the records were again associated with riparian vegetation. The closest record to the current Study Area occurred approximately 70 km to the east.

No records of *Phyllanthus* sp. Port Hedland Solar Farm were identified within the Permit Area.





Figure 6: Significant flora records within the Study Area

 <p>Western Australia</p> <p>PERTH</p>	<p>Alinta Energy Pty Ltd via Preston Consulting Port Hedland Solar Farm Project</p>	<p>Study Area</p>		
	<p>Project No 1387 Date 3/12/2021 Drawn by IN Map author GW</p>		<p>■ <i>Phyllanthus</i> sp. Port Hedland Solar Farm</p>	
	<p>0 250 500 Meters</p>			
<p>1:19,290 (at A4) GDA 1994 MGA Zone 50</p>				
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4.5.3 INTRODUCED FLORA SPECIES

Six introduced flora (Weed) species were recorded during the survey:

- *Aerva javanica*;
- *Stylosanthes hamata*;
- *Echinochloa colona*;
- *Cenchrus ciliaris*;
- *Chloris virgata*; and
- *Cynodon dactylon*.

Of the identified Weed species identified, none are declared or listed as Weeds of National Significance (Department of Primary Industries and Regional Development, 2021).

4.5.4 VEGETATION TYPE

Six vegetation types were recognised within the Study Area (Figure 7), however only four intersect with the Permit Area (AtpAseTe, AtpAstTe, AsTe and EsPm). Vegetation types and their relative extents across the Study Area are presented in Table 2. Acacia shrublands over Triodia hummock grasslands (vegetation types AtpAseTe and AtpAstTe) and Triodia hummock grasslands (vegetation types AsTe and Te) combined covered 97.6% of the Study Area.

Table 2: Vegetation types recorded within the Study Area

Vegetation type	Description	Within Study Area (ha)
AtpAseTe	Open mid shrubland of <i>Acacia tumida</i> var. <i>pilbarensis</i> and <i>A. sericophylla</i> over a low shrubland of <i>A. stellaticeps</i> , <i>Corchorus incanus</i> subsp. <i>incanus</i> and <i>Bonamia erecta</i> , over mid to low grassland of <i>Triodia epactia</i> , <i>Chrysopogon fallax</i> and <i>T. schinzii</i> .	157.0
AtpAstTe	Mid sparse shrubland of <i>Acacia tumida</i> var. <i>pilbarensis</i> over low isolated shrubs of <i>A. stellaticeps</i> , <i>Senna notabilis</i> and <i>Bonamia erecta</i> , over mid to low open grassland of <i>Triodia epactia</i> , <i>Chrysopogon fallax</i> and <i>Aristida holathera</i> .	186.9
EvAaAsTe	Low isolated trees of <i>Eucalyptus victrix</i> over isolated tall shrubs of <i>Acacia ampliceps</i> and variably present <i>A. colei</i> over low isolated shrubs of <i>A. stellaticeps</i> , <i>Sesbania cannabina</i> and <i>Pluchea ferdinandi-muelleri</i> over a mid to low grassland of <i>Triodia epactia</i> , * <i>Cenchrus ciliaris</i> and <i>Chrysopogon fallax</i> .	6.3
AsTe	Mid isolated shrubs of <i>Acacia stellaticeps</i> over a mixed grassland of <i>Triodia epactia</i> , <i>Eriachne obtusa</i> and <i>Fimbristylis dichotoma</i> .	243.9
Te	Low grassland of <i>Triodia epactia</i> , <i>T. secunda</i> and <i>Eriachne obtusa</i> .	22.6
EsPm	Low sparse tussock grassland of <i>Eriachne sulcata</i> , occasionally with <i>E. obtusa</i> , over low mixed herbs including <i>Peplidium muelleri</i> , <i>Marsilea hirsute</i> and <i>Byblis liniflora</i> .	0.5

4.5.5 VEGETATION CONDITION

The condition of vegetation was mapped across the Study Area based on the appropriate condition scale for the Eremaean Botanical Province (Keighery 1994 in EPA 2016). Vegetation in



the Study Area was recorded to be in Degraded to Excellent condition, with the majority (98.6 %) in Excellent to Very Good condition (Figure 8; Table 3).

Table 3: Vegetation condition recorded within the Study Area

Condition Rating	Within Study Area (ha)
Excellent	590.5
Very Good	25.9
Degraded	1.1
Completely Degraded	7.3

4.5.6 THREATENED AND PRIORITY ECOLOGICAL COMMUNITIES

No Threatened or Priority Ecological Communities (TECs or PECs) were found or are known to occur within the Study Area (Phoenix, 2021a).



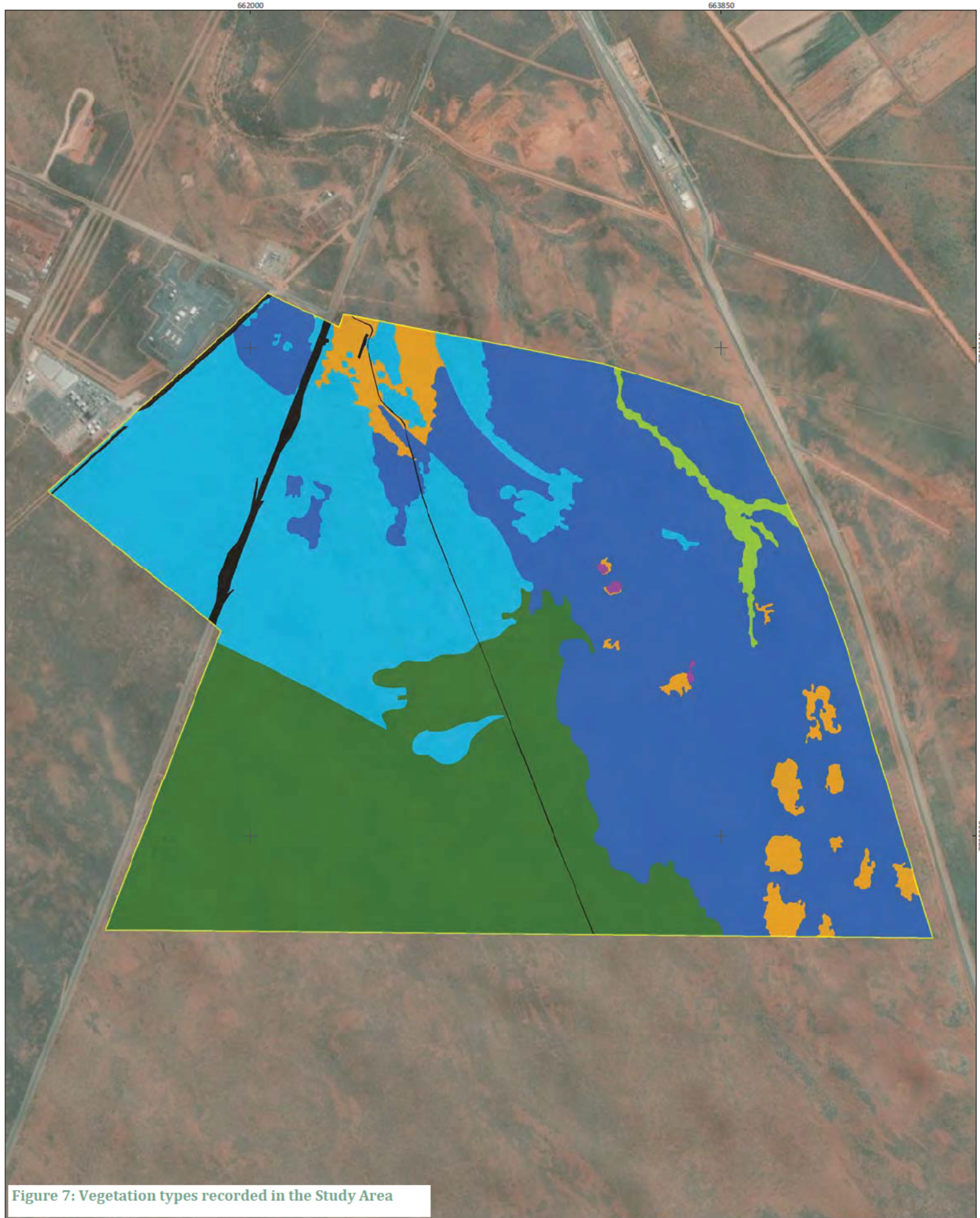













Figure 7: Vegetation types recorded in the Study Area

 <p>Western Australia PERTH</p>	<p>Alinta Energy Pty Ltd via Preston Consulting Port Hedland Solar Farm Project</p> <p>Project No 1387 Date 3/12/2021 Drawn by IN Map author GW</p>		<p>Study Area</p> <p>Vegetation type</p> <p>AsTe</p> <p>AtpAseTe</p> <p>AtpAstTe</p> <p>EsPm</p> <p>EvAaAsTe</p> <p>Te</p> <p>Cleared</p>	
	<p>0 250 500 Meters</p> <p>1 19,300 (at A4) GDA 1994 MGA Zone 50</p>			
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Figure 8: Vegetation condition in the Study Area

 <p>Western Australia PERTH</p>	<p>Alinta Energy Pty Ltd via Preston Consulting Port Hedland Solar Farm Project</p>		<p> Study Area</p>
	<p>Project No 1387 Date 3/12/2021 Drawn by IN Map author GW</p>		<p>Vegetation condition</p> <p> Excellent</p> <p> Very Good</p> <p> Degraded</p> <p> Cleared</p>
<p>0 250 500 Meters</p>		<p>1:19,300 (at A4) GDA 1994 MGA Zone 50</p>	
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4.6 FAUNA

4.6.1 FAUNA HABITAT

Two broad fauna habitats have been defined for the Study Area with sandplain habitat accounting for 96.4% of the mapped habitat. The Permit Area is comprised entirely of the sandplain habitat which includes the following dominant vegetation complexes:

- Spinifex hummock grasslands supported by scattered low *Acacia striaticeps* shrubs;
- Isolated patches of *Acacia tumida pilbarensis* tall shrubs over low to mid mixed *Acacia* shrubs with scattered stage one spinifex hummocks;
- Open tussock grassland with mixed low fire-ephemeral shrubs; and
- Isolated patches of tall *Acacia tumida pilbaraences* over mixed mid *Acacia* dominant shrubland with evenly scattered long-unburnt, stage three, four and five spinifex hummocks.

4.6.2 LISTED FAUNA

Sixty-two significant vertebrate fauna species were identified in the desktop review, two of which were confirmed in the Study Area (Greater Bilby and Brush-tailed Mulgara; see Section 4.6.3). Of the remaining species, none were considered likely to occur, seven were possible to occur and 53 were unlikely to occur (Phoenix, 2021b). The seven species identified as possibly occurring and their conservation status are:

- Northern Quoll (Endangered (EN); EPBC and BC Act);
- Ghost Bat (VU; EPBC and BC Act);
- Grey Falcon (VU; BC Act);
- Fork-tailed Swift (Migratory; EPBC and BC Act);
- Oriental Plover (Migratory; EPBC and BC Act);
- Oriental Pratincole (Migratory; EPBC and BC Act); and
- Peregrine Falcon (other specially protected species (OS); BC Act).

The Peregrine Falcon, Grey Falcon and Ghost Bat were identified as potential visitors as part of their wide foraging ranges but are unlikely resident species due to absence of suitable nesting or roosting habitat. Similarly, the Northern Quoll may possibly occur along minor drainage habitat during dispersal events but is unlikely to be a resident due to absence of suitable denning habitat. The remaining three migratory birds may possibly occur sporadically while foraging.

4.6.3 RECORDED SIGNIFICANT FAUNA

Phoenix (2021b) recorded secondary evidence of one Threatened and one Priority species in the Study Area and Targeted Survey Area; Greater Bilby (VU; EPBC and BC Acts) and Brush-tailed Mulgara (P4; DBCA).

Greater Bilby (Macrotis lagotis)

Secondary evidence (tracks and scats) of the Greater Bilby was recorded from 99 locations within the Study Area during the detailed fauna survey, however no active burrows were identified



(Figure 6). The majority of the secondary evidence (87%) was recorded in or near the minor drainage habitat in the Environmental Area. The remaining locations were all located west of Great Northern Highway in long unburnt sandplain habitat.

Forty-eight scats were recorded in the Study Area from the targeted Bilby survey, all of which were identified to be the remains of Bilby activity from the detailed survey six months prior. Given the widespread occurrence of feral predators throughout the Study Area, as evident from the 36 locations of secondary evidence, it is possible that the target population has been wiped out in the six months between survey phases. Additionally, the frequent fire history of the Study Area, most recent of which affected approximately 300 ha (48%) of vegetation within the central and southern extents, adds further weight to this explanation as fire creates favourable conditions for predators because it destroys suitable cover for prey species (Dziminski et al. 2020). Despite an extensive and targeted effort during the survey, no burrows were located. It was concluded that the core range of the target population is west of Great Northern Highway, given the widespread locations of old scats recorded during the targeted Bilby survey (Figure 10).

Brush-tailed Mulgara (Dasycercus blythi)

One track sequence and one burrow identified as Brush-tailed Mulgara were recorded from sandplain habitat. According to the DBCA (2021) *Threatened and Priority Fauna Database*, Brush-tailed Mulgara were previously recorded at 32 locations within the Study Area in 2012. Their relative absence in 2021, compared with 2012, is a likely a result of the high frequency and extent of fires within the Study Area since 2012. While the species may return to the Study Area after sufficient regeneration of spinifex grasslands, suitable habitat for the species is abundant both locally (within the Roebourne subregion and Uaroo land system) and throughout the Pilbara bioregion. Brush-tailed Mulgara are well documented from sandplain habitat in the Pilbara, predominantly in spinifex hummock grasslands and shrublands on sandy soils (Menkhorst & Knight 2011). Sandplain habitat is well represented in the Pilbara bioregion with approximately 99% of the pre-European vegetation currently remaining. As such, the relatively small area of suitable habitat present within the Study Area is not regarded as high value to the species.



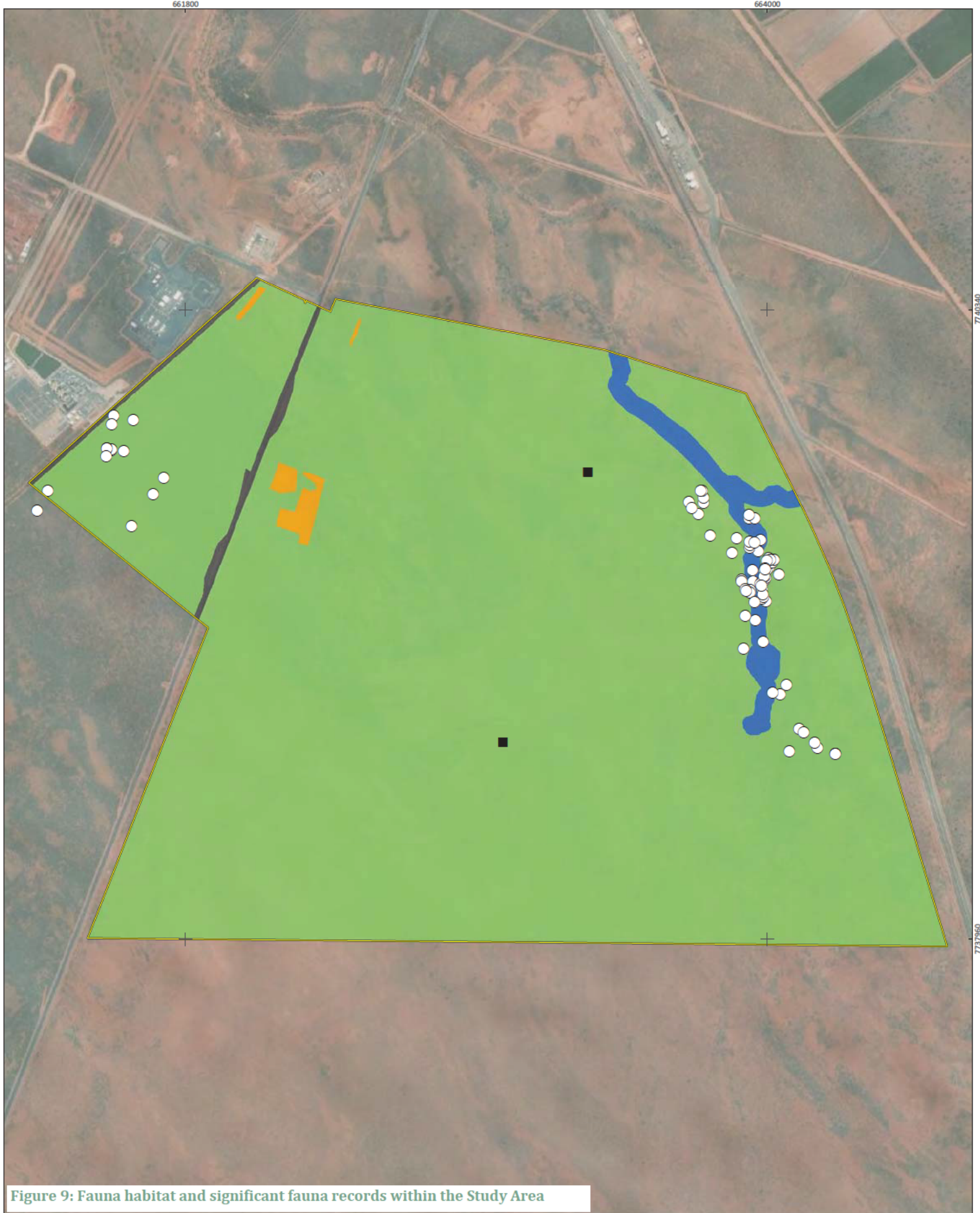


Figure 9: Fauna habitat and significant fauna records within the Study Area

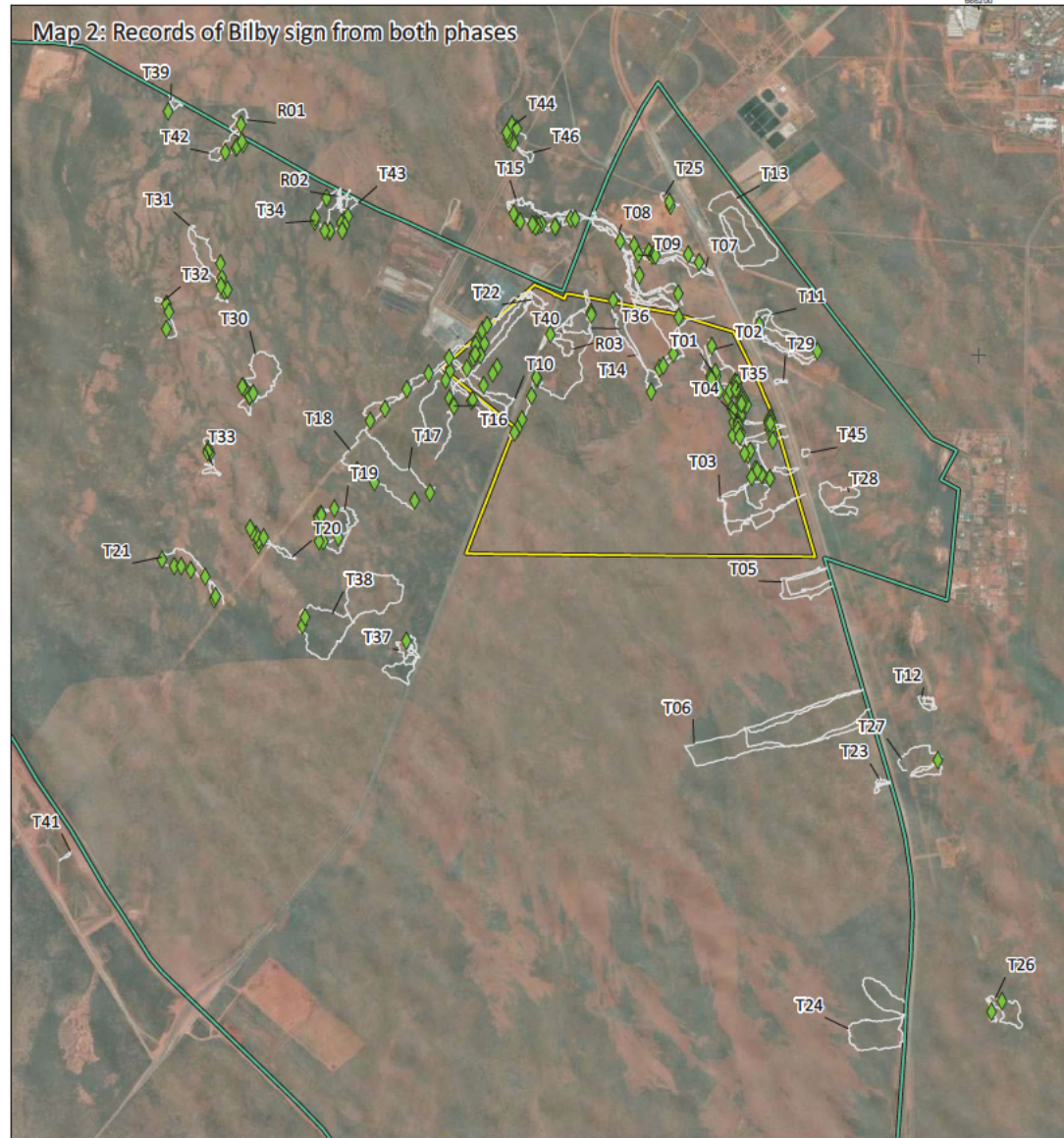
<p>Western Australia</p> <p>PERTH</p>	<p>Alinta Energy Pty Ltd via Preston Consulting Port Hedland Solar Farm Project</p> <p>Project No 1388 Date 21/07/2021 Drawn by IN Map author SP</p>	<p>Study area</p> <p>Species, status</p> <ul style="list-style-type: none"> ■ <i>Dasycercus blythi</i>, P4 (DBC Act) ○ <i>Macrotis lagotis</i>, VU (EPBC Act, BC Act) 	<p>Fauna habitat</p> <ul style="list-style-type: none"> ■ Sandplain ■ Minor drainage ■ Disturbed area ■ Road / Infrastructure 	
	<p>0 250 500 Meters</p> <p>1 18,500 (at A4) GDA 1994 MGA Zone 50</p>			


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Map 1: Records of Bilby sign from phase one





Map 2: Records of Bilby sign from both phases




Alinta Energy Pty Ltd via Preston Consulting Port Hedland Solar Farm Project	
Project No	1454
Date	8/11/2021
Drawn by	IN
Map author	SP
	
Map 1 0 240 480 Meters	Map 2 0 0.5 1 Kilometers
1:17,501 (Map 1, at A3)	GDA 1994 MGA Zone 50
1:48 773 (Map 2, at A3)	

 Study Area


 Targeted Bilby survey area

 *Macrotis lagotis*, VU (EPBC Act, BC Act)

Map 1: Phase 1

 Transect 01

 Transect 02

 Transect 03

 Transect 04

 Transect 05

 Transect 06

 Transect 07

 Transect 08

Figure 10: Locations of secondary evidence of Bilby within the Study Area and Targeted Survey Area



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4.7 WATER AND DRAINAGE

South West Creek runs to the east and north of the site, crosses Great Northern Highway under a road bridge and continues for 9 km to Port Hedland Harbour (RPS, 2021). Most of the creek catchment lies to the east of the FMG rail line to Port Hedland. One tributary of the creek passes about 200 m from the north east corner of the Study Area (within the Environmental Area). The Study Area only represents approximately 0.4% of the South West Creek catchment (at the Great Northern Highway bridge) (RPS, 2021). South West Creek does not intersect the Permit Area.

4.8 CURRENT LAND USE

The Permit Area is located approximately 3 km south-west of South Hedland in Town of Port Hedland on a portion of UCL. The land is generally flat, devoid of permanent physical infrastructure and consists of low-lying native vegetation that reflects recent fire history.



5 STAKEHOLDER CONSULTATION

Alinta has consulted with the following key stakeholders regarding the Project:

- Department of Agriculture, Water, and the Environment (Commonwealth);
- Department of Water and Environmental Regulation (WA) – Part IV *Environmental Protection Act 1986* (EP Act) assessment process, works approvals and licences under Part V of the EP Act;
- Town of Port Hedland – Development approval, bushfire management; and
- Kariyarra People (Prescribed Body Corporate - Kariyarra Aboriginal Corporation).

Alinta will continue to consult with key stakeholders throughout the life of the Project.

6 ASSESSMENT OF CLEARING AGAINST THE TEN CLEARING PRINCIPLES

The proposed vegetation disturbance has been assessed against the ten clearing principles described within *A Guide to the Assessment of Applications to Clear Native Vegetation* (Department of Environmental Regulation 2014; Table 4).



Table 4: Assessment of proposed vegetation disturbance against the ten clearing principles

Relevant Information	Assessment of potential impacts	Proposed control measures	Outcome – Assessment of variance with clearing principle
1. Native Vegetation should not be cleared if it comprises a high level of biological diversity			
<p>Detailed surveys of the Study Area were undertaken by Phoenix (2021a).</p> <p>No Threatened or Priority flora or ecological communities were identified during surveys.</p> <p>One locally significant flora species was identified along the minor drainage line to the east of the Study Area, outside the Permit Area.</p> <p>The vegetation in the Permit Area is identified as Vegetation Association 589. Vegetation Association 589 has over 99% of pre-European extent remaining and is classed as Least Concern.</p>	<p>No recorded significant flora or vegetation will be disturbed by the proposed clearing.</p> <p>The proposed clearing will result in the removal of up to 15 ha of native vegetation, this clearing represents:</p> <ul style="list-style-type: none"> • <0.01% of the remaining extent of Vegetation Association 589 • ~3% of Excellent vegetation within the Study Area • 2.5% of the Sandplain fauna habitat type within the Study Area 	<p>To minimise the impact of clearing on the environment, Alinta proposes the following control measures:</p> <ul style="list-style-type: none"> • All clearing will be managed under a clearing contractor’s Ground Disturbance Permit (or similar); • Locate clearing areas such that they can be utilised for the future Project if it proceeds (i.e. access roads, laydown); • The total extent of vegetation clearing is limited to 15 ha; • The clearing areas will be identified using GPS coordinates; • All clearing kept to a minimum within the proposed Permit Area and completed only when required; and • All vehicles, equipment and personnel will be inspected and cleaned as required to prevent the incidental spread of weeds. 	<p>The proposed clearing is not at variance with this principle.</p>
2. Native vegetation should not be cleared if it comprises the whole, or part of, or is necessary for the maintenance of a significant habitat for fauna indigenous to WA			
<p>Sandplain habitat was the only fauna habitat identified within the Permit Area (Phoenix, 2021b).</p> <p>The Permit Area has been identified as suitable Bilby habitat, however this area is currently unoccupied due to recent fires. No recent evidence of Bilby has been recorded in the Permit Area.</p> <p>The core range of the Bilby population was concluded to be west of Great Northern Highway given the widespread locations of old scats recorded in the targeted survey.</p> <p>Sandplain habitat comprises isolated <i>Acacia</i> shrublands, patches of low <i>Acacia</i> shrublands, spinifex grasslands and open grasslands.</p>	<p>While flora and vegetation are utilised by fauna for food and habitat, there are no known obligate fauna-flora correlations within the Permit Area.</p> <p>The proposed clearing will occur within habitat that has shown to be utilised by significant fauna in the past. This clearing represents only 2.5% of mapped extent within the Study Area and is unlikely to significantly impact the re-colonisation of the area.</p>	<p>Implement control measures described above.</p> <p>Undertake pre-clearance surveys for active Bilby burrows.</p>	<p>The proposed clearing may be at variance with this principle.</p>
3. Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora			



Relevant Information	Assessment of potential impacts	Proposed control measures	Outcome – Assessment of variance with clearing principle
<p>No Threatened or Priority flora were recorded in the Permit Area (Phoenix, 2021a).</p> <p><i>Seringia exastia</i> is known from the general area and is listed as Threatened Flora. It is considered that this species does not warrant Conservation Listing and will be removed from the Threatened Flora List following the next census.</p> <p>A solitary plant of one taxon, <i>Phyllanthus</i> sp. Port Hedland Solar Farm was collected along the minor drainage in the Environmental Area. No records were identified in the Permit Area.</p>	<p>No known records of Threatened or Priority Flora will be impacted by the clearing.</p> <p>While it is possible that significant flora may occur within the Permit Area, the clearing of 15 ha of habitat for these species is unlikely to affect the continued existence of any significant flora.</p>	<p>Implement control measures described above.</p>	<p>The proposed clearing is not likely to be at variance with this principle.</p>
<p>4. Native vegetation should not be cleared if it comprises the whole or part of, or is necessary for the maintenance of, a Threatened Ecological Community</p>			
<p>Detailed surveys of the Study Area were undertaken (Phoenix, 2021a). None of the vegetation recorded within the Study Area was considered to represent a TEC.</p>	<p>Not applicable</p>	<p>Not applicable</p>	<p>The proposed clearing is not at variance with this principle.</p>
<p>5. Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared</p>			
<p>The Permit Area lies entirely within the Pilbara Bioregion, specifically located on the Roebourne IBRA Subregion. The Roebourne subregion covers 2,008,983 ha.</p> <p>The vegetation in the Permit Area is identified as Vegetation Association 589. Vegetation Association 589 has over 99% of pre-European extent remaining and is classed as Least Concern.</p>	<p>The Permit Area does not represent a significant remnant of native vegetation in an extensively cleared area.</p> <p>The proposed clearing will result in the removal of up to 15 ha of native vegetation, this clearing represents:</p> <ul style="list-style-type: none"> • <0.01% of the remaining extent of Vegetation Association 589. • ~3% of Excellent vegetation within the Study Area. 	<p>Implement control measures described above.</p>	<p>The proposed clearing is not at variance with this principle.</p>
<p>6. Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland</p>			
<p>The Permit Area is located within the Pilbara Surface Water Area.</p> <p>The main drainage feature is South West Creek which runs along the eastern side of the Study Area. The South West Creek lies within the Environmental Area and is not included in the proposed Permit Area.</p>	<p>No watercourses or permanent wetlands are present within the Permit Area.</p>	<p>Not applicable</p>	<p>The proposed clearing is not at variance with this principle</p>



Relevant Information	Assessment of potential impacts	Proposed control measures	Outcome – Assessment of variance with clearing principle
7. Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation			
The area within and surrounding the Permit Area remains mostly uncleared with disturbance limited to that caused by Great Northern Highway and smaller access tracks. No declared pests or Weeds of National Significance were recorded within the Permit Area (Phoenix, 2021a).	Land degradation will be limited to the 15 ha of proposed land clearing required for geotechnical investigations. This represents clearing of 3.3 % of Excellent vegetation within the Study Area. The proposed clearing will impact a relatively small area of Excellent vegetation and is not likely to cause significant land degradation.	Implement control measures described above	The proposed clearing is not likely to be at variance with this principle.
8. Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area			
The proposed clearing area does not occur within or adjacent to any conservation areas. The nearest conservation reserve is Mungaroo Range Nature Reserve, located approximately 95.2 km southwest of the Study Area.	Not applicable	Not applicable	The proposed clearing is not at variance with this principle.
9. Native vegetation should not be cleared if the clearing is likely to cause deterioration in the quality of surface or underground water			
The Permit Area is located within the Pilbara Surface Water Area. South West Creek runs to the east of the site and near the north-east corner of the Study Area. It crosses Great Northern Highway under a bridge, and then continues for 9km, to discharge into the Port Hedland Harbour. South West Creek does not intersect the Permit Area.	The proposed clearing represents a small area of clearing in an otherwise relatively uncleared landscape. The proposed clearing is not expected to cause deterioration in the quality of surface or underground water. Geotechnical investigations will not intersect the water table.	Implement the control measures described above	The proposed clearing is not likely to be at variance with this principle.
10. Native vegetation should not be cleared if the clearing is likely to cause, or exacerbate, the incidence or intensity of flooding			
The region is generally dry, with occasional significant rainfall events often associated with cyclones. The Study Area only represents approximately 0.4 % of the South West Creek catchment.	The proposed vegetation clearing is small in scale and is not expected to cause, or exacerbate, the incidence or intensity of flooding within the Permit Area or surrounding landscape.	Implement the control measures described above	The proposed clearing is not likely to be at variance with this principle.



7 SUMMARY AND CONCLUSIONS

The purpose of this NVCP Application is to allow the clearing of up to 15 ha of native vegetation within a 457.1 ha Permit Area for geotechnical investigations as described in Section 3.

The following key points are noted:

- The area has been extensively surveyed for Alinta’s proposed Port Hedland Solar Farm and the results of these surveys have been used to assess the impacts of clearing;
- The proposed clearing will not result any significant impacts to the following:
 - Threatened and Priority Flora;
 - TECs or PECs;
 - Wetlands / surface water; or
 - Conservation areas.

Alinta has also identified a number of control measures to minimise the impacts to native vegetation. These measures include the following:

- All clearing to be managed under a clearing contractor’s Ground Disturbance Permit (or similar);
- The total extent of vegetation clearing is limited to up to 15 ha of disturbance;
- The clearing areas will be identified using GPS coordinates;
- All clearing kept to a minimum within the Permit Area and completed only when required; and
- All vehicles, equipment and personnel will be inspected and cleaned as required to prevent the incidental spread of weeds.

This NVCP application assessed the proposed vegetation clearing against the ten clearing principles described in *A Guide to the Assessment of Applications to Clear Native Vegetation* (DER, 2014)



8 GLOSSARY

Term	Meaning
AC	Alternating Current
Alinta	Alinta Energy Development Pty Ltd
Environmental Area	Exclusion zone developed to reduce impacts to identified environmental values (Figure 1).
BC Act	<i>Biodiversity Conservation Act 2016</i>
CR	Critically Endangered
DBCA	Department of Biodiversity, Conservation and Attractions
DER	Department of Environmental Regulation (now Department of Water and Environmental Regulation)
EN	Endangered
EP Act	<i>Environmental Protection Act 1986</i>
EPBC Act	<i>Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth)</i>
ha	Hectares
IBRA	Interim Biographical Regionalisation for Australia
ILUA	Indigenous Land Use Agreement
km	Kilometres
kV	Kilovolt
m	Metre
MW	Megawatt
NVCP	Native Vegetation Clearing Permit
OS	Specially Protected
P	Priority - flora and fauna species listed as being possibly threatened under priorities of 1, 2, 3 or 4 under the Biodiversity Conservation Act 2016
PEC	Priority Ecological Communities – plant communities listed as being potentially threatened under the <i>Wildlife Conservation Act 1950</i>
Phoenix	Phoenix Environmental Sciences Pty Ltd
PHPS	Port Hedland Power Station
Permit Area	Boundary for clearing proposed in this NVCP Figure 1 Figure 2
Project Area	Indicative area for the Port Hedland Solar Farm Project (Figure 1)
Study Area	Detailed flora and fauna study area (Phoenix, 2021a,b; Figure 2)
T	Threatened
Targeted Survey Area	Targeted Bilby survey area (Phoenix, 2021b; Figure 2)
The Project	Alinta’s Port Hedland Solar Farm Project
TEC	Threatened Ecological Communities – plant communities listed as being threatened and legally protected under the <i>Biodiversity Conservation Act 2016</i> and / or the <i>Environment Protection and Biodiversity Conservation Act 1999</i>
UCL	Unallocated Crown Land
VU	Vulnerable
WA	Western Australia
Weed	Introduced flora



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