

# Technical Memorandum

October 19, 2022

<b>To</b>			
<b>Copy to</b>			
<b>From</b>	Sarah Isbister Pali Jayasekara	<b>Project No.</b>	12582802
<b>Project Name</b>	Woodside Pluto Connection Project		
<b>Subject</b>	Pluto Additional Areas Reconnaissance/Basic Survey		

## 1. Introduction

### 1.1 Background

Horizon Power is proposing to connect the existing Woodside Pluto Facility to the North West Interconnected System (NWIS) (the Project). The Project is located on the Burrup Peninsula, Western Australia (WA).

The Project will enable the Woodside Pluto Facility to access low carbon grid electricity (that overtime is expected to become increasingly renewable) from the NWIS.

Horizon Power has previously engaged GHD Pty Ltd (GHD) to complete biological surveys within the vicinity of the Project, these included:

- (GHD 2020) – Horizon Power Burrup Expansion Project Flora and Vegetation Survey
- (GHD 2022) – Maitland to Karratha Terminal Flora and Fauna Survey.

These existing surveys are located within close proximity, but do not cover the proposed Project Development Envelope (DE) for this work. The purpose of this reconnaissance/basic survey was to assess native vegetation and flora present in the DE (the additional survey area). The survey includes areas adjacent to existing vehicle access tracks and Burrup Road.

This survey is intended to inform and facilitate a Native Vegetation Clearing Permit (NVCP) application under Section 51E of Part V of the *Environmental Protection Act 1986* (EP Act).

### 1.2 Purpose

Horizon Power commissioned GHD to undertake a reconnaissance survey of the additional survey area. The survey is required to verify that the dominant vegetation units, vegetation condition and associated fauna habitats of the additional survey area is consistent with the results of the adjacent recent surveys (GHD 2020; 2022).

The purpose of the survey is to support an NVCP application for the Project, under Section 51E of Part V of EP Act.

This memorandum should be read in conjunction with the existing surveys identified in Section 1.1.

## 1.3 Scope of works

GHD undertook the following scope of works:

- Review of existing surveys within the vicinity of the Project
- A site visit by a qualified botanist to verify the flora and vegetation and fauna values (which were verified by a Senior ecologist), including vegetation condition and undertaking opportunistic searches for significant flora and fauna
- A site visit by a qualified botanist to confirm the presence and extent of significant vegetation
- The preparation of a memorandum summarising the findings of the survey.

The additional survey area is shown on Figure 1, Appendix A and covered 8.70 ha.

## 1.4 Limitations and assumptions

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The opinions, conclusions and any recommendations in this memorandum are based on assumptions made by GHD described in this memorandum. GHD disclaims liability arising from any of the assumptions being incorrect.

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This memorandum has assessed the flora and fauna within the defined additional survey areas. Should the survey area change or be refined, further assessment may be required.

## 2. Methodology

### 2.1 Field survey

GHD senior botanist Pali Jayasekara (flora licence no. FB62000208-2) completed the field survey over two days on 3-4 August 2022. Pali Jayasekara has extensive experience in undertaking biological surveys across Western Australia, and in particular the Pilbara region. Additionally, Pali Jayasekara was involved in the project team on the original surveys (GHD 2020, GHD 2022), and a similar methodology and approach has been maintained for the current reconnaissance/basic survey.

The field survey was undertaken to verify that the dominant vegetation units, vegetation condition and associated fauna habitats of the additional survey area is consistent with the results of adjacent recent

surveys (GHD 2020; 2022). Searches for significant flora and fauna species were also undertaken within the additional survey area.

The survey method involved placing waypoints within the additional survey area. The area around the waypoints was then traversed on foot, with opportunistic recordings and photographic reference points within identified vegetation units taken. The vegetation within the additional survey area was mapped using the data collected from the waypoints, and in some areas extrapolated based on similar surrounding vegetation.

Navigation across the site and the recording of data in the field was achieved using hand-held GPS tools, including a Samsung tablet and Garmin GPS. This ensured accurate representation of features observed on the ground into spatial mapping

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 *Technical Guidance - Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA 2020).

### **Vegetation condition**

The vegetation condition was assessed and mapped in accordance with the Eremaean and Northern Botanical Provinces of Western Australia scale devised by Keighery (1994) and adapted by EPA (2016). The scale recognises the intactness of vegetation and consists of six rating levels.

## **2.2 Survey limitations**

The EPA (2016, 2020) states that flora and fauna survey reports for environmental impact assessment in WA should contain a section describing the limitations of the survey methods used. The limitations and constraints associated with this field survey are discussed in Table 1.

**Table 1**      *Survey limitations*

<b>Aspect</b>	<b>Constraint</b>	<b>Comment</b>
Sources of information and availability of contextual information.	Nil	Adequate information is available for the survey area, this includes broadscale (1:1,000,000) mapping by Beard (1975) and digitised by Shepherd et al. (2002) and database searches (DBCA and ALA).
Scope (what life forms were sampled etc.)	Nil	Vascular flora and terrestrial vertebrate fauna were surveyed. Non-vascular flora, invertebrate and aquatic fauna were not surveyed.
Proportion of flora and fauna collected and identified (based on sampling, timing and intensity)	Minor	The Reconnaissance/Basic Survey was completed on 3-4 August 2022, outside of the primary survey season (March to June) for the Eremaean region. Based on the EPA (2016) guidance (refer to Table 3 of the guidance), supplementary surveys can be completed in the dry season after winter rainfall. The primary objective of this survey was to expand vegetation mapping, vegetation condition mapping and fauna habitat mapping in previously unsurveyed areas of the DE. The conditions experienced were not expected to limit the survey findings for these objectives.
Flora determination	Nil	Flora determination was undertaken by the survey botanist in the field. Species that could not be identified in the field were collected and identified at the WA Herbarium by the experienced GHD taxonomic botanist Pali Jayasekara.  The taxonomy and conservation status of the WA flora is dynamic. This report was prepared with reliance on taxonomy and conservation status current at the time report development, but it should be noted this may change in response to ongoing research and review of International Union for Conservation Nature criteria.
Completeness and further work which might be needed (e.g. was the relevant area fully surveyed)	Nil	Waypoints were placed within each of the additional survey areas. The area around the waypoints was then traversed on foot, with opportunistic recordings and photographic reference points within identified vegetation units taken. The vegetation within the additional survey areas was mapped using the data collected from

Aspect	Constraint	Comment
		<p>the waypoints, and in some areas extrapolated based on similar surrounding vegetation.</p> <p>The survey areas were adequately surveyed during the field survey in line with the scope. Additional opportunistic sampling was undertaken throughout all survey areas to develop a comprehensive species inventory.</p>
Mapping reliability	Nil	<p>The vegetation and fauna habitats were mapped using high-resolution ESRI aerial imagery obtained from Landgate, topographical features, previous broad scale mapping (Beard 1975) and field data. Data was recorded in the field using hand-held GPS tools. Certain atmospheric factors and other sources of error can affect the accuracy of GPS receivers. The Garmin GPS units and GPS enabled tablets used for this survey are accurate to within 2-5 metres on average.</p>
Timing/weather/season/cycle	Moderate	<p>The field survey was conducted during the dry-season (3-4 August 2022). In the four months prior to the survey (November-February), the Karratha Aero (station No. 004083) recorded a total of 249.2 mm of rainfall (Bureau of Meteorology 2022). Large rainfall was experienced in late May 2022.</p> <p>The Reconnaissance/Basic Survey was completed on 3-4 August 2022, outside of the primary survey season (March to June) for the Eremaean region. Based on the EPA (2016) guidance (refer to Table 3 of the guidance), supplementary surveys can be completed in the dry season after winter rainfall. The primary objective of this survey was to expand vegetation mapping, vegetation condition mapping and fauna habitat mapping in previously unsurveyed areas of the DE. The conditions experienced were not expected to limit the survey findings for these objectives.</p>
Disturbances (e.g. fire, flood, accidental human intervention)	Nil	<p>Some of the survey areas have been subjected to historical disturbance events (e.g. clearing, weeds); however, these disturbances did not affect the survey.</p>
Intensity (in retrospect, was the intensity adequate)	Nil	<p>The vascular flora of the survey area was sampled in accordance with EPA (2016) and terrestrial fauna sampled in accordance with EPA (2020).</p> <p>The survey area was sufficiently covered by the field botanist during the survey.</p>
Resources	Nil	<p>Adequate resources were employed during the field survey. One botanist undertook the survey over two days (total survey time being two person days).</p>
Access restrictions	Nil	<p>The survey area was accessed on foot and vehicle. There were no access restrictions.</p>
Experience levels	Nil	<p>The botanist who executed the survey is a practitioner suitably qualified and experienced in his field. The field team lead, Pali Jayasekara (flora licence no. FB62000208-2), is a senior botanist with more than 17 years' experience leading and conducting vegetation and flora surveys (detailed, basic and targeted) in the Eremaean province.</p>

### 3. Results

#### 3.1 Vegetation types and condition

The vegetation identified within the additional survey area was not considered to be consistent with the vegetation types previously identified by GHD (2020; 2022).

One new vegetation type was identified within the additional survey area during the survey (Table 2 and Figure 2, Appendix A). Vegetation covers 8.61 ha of the additional survey area, with the remaining 0.09 ha being cleared. The survey area is located adjacent to the Woodside Pluto Facility and Burrup Road.

Table 2 Vegetation type recorded within the additional survey area

Vegetation type	Vegetation type description	Total extent (ha)
VT01	<i>Brachychiton acuminatus</i> isolated low trees over <i>Grevillea pyramidalis</i> subsp. <i>pyramidalis</i> , <i>Terminalia supranitifolia</i> (Priority 3) and <i>Flueggea virosa</i> subsp. <i>melanthesoides</i> scattered to isolated shrubs over <i>Triodia epactia</i> and <i>T. wisea</i> open hummock grassland over <i>Cymbopogon ambiguus</i> and <i>*Cenchrus ciliaris</i> open tussock grassland and <i>Tinospora smilacina</i> and <i>Ipomoea costata</i> open vineland on rock piles.	8.61
Total native vegetation		8.61
Cleared areas		0.09
Total		8.70

Vegetation within the additional survey area is in Very Good condition, as shown on Figure 3, Appendix A.

#### 3.2 Significant vegetation

The vegetation type (VT01) mapped within the additional survey area is considered to represent the Priority 1 Burrup Peninsula Rock Pile Communities Priority Ecological Community (PEC). The Burrup Peninsula Rock Pile Communities are pockets of vegetation in rock piles, rock pockets and outcrops. The community comprises a mixture of Pilbara and Kimberley species, and is different from those of the Hamersley and Chichester Ranges.

There is 8.61 ha of this PEC within the additional survey area (Figure 4, Appendix A). No vegetation recorded within the additional survey area is considered to represent riparian vegetation.

#### 3.3 Significant flora

Three Priority species listed by the Department of Biodiversity, Conservation and Attractions (DBCA) were recorded within the additional survey area:

- *Terminalia supranitifolia* (Priority 3)
- *Vigna triodiophila* (Priority 3)
- *Rhynchosia bungarensis* (Priority 4).

The location of these species within the additional survey area is provided on Figure 5, Appendix A.

### ***Rhynchosia bungarensis***

*Rhynchosia bungarensis* (Plate 1) is listed as Priority 4 by the DBCA 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 (WA Herbarium 1998–).

According to *FloraBase* there are 84 records of this species, with a large number of records concentrated on the Burrup Peninsula (WA Herbarium 1998–).

This species was recorded within the additional survey area during the survey. Individuals were located inside the rockpiles on the Burrup Peninsula, in the cracks of incised boulders. Two individuals were recorded during the survey.



Plate 1 *Rhynchosia bungarensis*

### ***Terminalia supranitifolia***

*Terminalia supranitifolia* (Plate 2) 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 as Priority 3 by the DBCA. Habitat includes sandy areas among basalt rocks (WA Herbarium 1998–). There are 54 records of *T. supranitifolia* reported on *FloraBase* across WA (WA Herbarium 1998–).

Eleven individuals were recorded within the additional survey area. Some records were isolated plants, whilst most occurred in close proximity along the undulating rockpiles.



Plate 2 *Terminalia supranitifolia*

### ***Vigna triodiophila***

*Vigna triodiophila* (Plate 3) 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 as Priority 3. It is endemic to basalt rockpile habitats in shallow, red-brown or brown, clayey sand or loam. There are 16 records of *Vigna triodiophila* reported on *FloraBase* across WA (WA Herbarium 1998-).

This species was recorded within the additional survey area, within the rockpiles on the Burrup Peninsula and was common. 43 individuals were recorded in total during the survey.



Plate 3 *Vigna triodiophila*

## **3.4 Fauna habitats**

One fauna habitat was identified within the additional survey area during the survey as described in Table 3 and shown on Figure 6, Appendix A.

Table 3 *Fauna habitats recorded within the additional survey area*

Fauna habitat	Total extent (ha)
<b>Rocky Hills with exposed boulder piles</b> Dominated by a Triodia hummock grassland, however, does support tussock grasses. However, the boulder rock piles are typically devoid of ground cover. The crests of hills contain extensive rock outcropping or boulder piles and support scattered <i>Grevillea pyramidalis</i> subsp. <i>pyramidalis</i> , <i>Terminalia supranitifolia</i> (P3) and <i>Brachychiton acuminatus</i> . The <i>Terminalis</i> , <i>Brachychiton</i> and <i>Grevilla</i> provided litter and scattered woody debris, however the boulder piles provide extensive cover via crevices, small caves and cavities. No evidence of recent fire was recorded in the survey area. Evidence of old fire scars were present and determined based on the age of the vegetation.	8.61
<b>Total fauna habitat</b>	<b>8.61</b>
Cleared areas	0.09
<b>Total</b>	<b>8.70</b>

### 3.5 Significant fauna

No significant fauna species were recorded within the additional survey area. However, based on the GHD (2020) survey, six significant fauna species are known to occur within the vicinity of the additional survey area (Table 4). These species may visit the additional survey area opportunistically, however, are not reliant on the habitat present within the additional survey area.

Based on previous surveys conducted within the area (GHD 2020), an additional three significant fauna species are considered likely to occur. These species are discussed further in Table 5.

**Table 4** Significant fauna species known to occur adjacent to the Burrup additional survey area (GHD 2020)

Fauna species	EPBC Act	BC Act/DBCA status
North-western Free-tail Bat ( <i>Mormopterus (Ozimops) cobourgiensis</i> )	-	Priority 1
Western Pebble-mound Mouse ( <i>Pseudomys chapmani</i> )	-	Priority 4
Whimbrel ( <i>Numenius phaeopus</i> )	Migratory	Protected under International Agreement
Gull-billed Tern ( <i>Gelochelidon nilotica</i> )	Migratory	Protected under International Agreement
Caspian Tern ( <i>Hydroprogne caspia</i> )	Migratory	Protected under International Agreement
Crested Tern ( <i>Thalasseus bergii</i> )	Migratory	Protected under International Agreement

**Table 5** Significant fauna species considered likely to occur within the additional survey area

Fauna species	EPBC Act	BC Act/DBCA status	Likelihood of occurrence
Northern Quoll ( <i>Dasyurus hallucatus</i> )	Endangered	Endangered	<b>Likely</b> The species was not recorded during the field survey, however, the species is known from the Burrup Peninsula in low numbers. Suitable habitat within the DE is present, including the Rocky Hills with exposed boulder piles habitat type.
Pilbara Olive Python ( <i>Liasis olivaceus barroni</i> )	Vulnerable	Vulnerable	<b>Likely</b> The Rocky Hills with exposed boulder piles would be regarded as important habitat for the species. The remainder of the habitat in the Burrup additional survey area is supportive only and the plain habitat off the Burrup is not habitat for Pilbara Olive Python.
Peregrine Falcon ( <i>Falco peregrinus</i> )	-	Other Specially Protected Fauna	<b>Likely</b> The Rocky Hills with exposed boulder piles provides suitable habitat. The Burrup additional survey area is likely part of the species broader home range for foraging.

## 4. Conclusion

The vegetation identified within the additional survey area is not considered to be consistent with the vegetation types and conditions previously identified by GHD (2020 & 2022). One new vegetation type was identified within the additional survey area.

Overall, there is one vegetation type within the additional survey area, with vegetation in Very Good condition. Vegetation within the additional survey area has been previously impacted by the presence of existing roads, access tracks and infrastructure.



There is a total of 8.61 ha of Priority 1 Burrup Peninsula Rock Pile Communities PEC within the additional survey area. No vegetation within the additional survey area is considered to represent riparian vegetation.

Three Priority flora species were recorded within the additional survey area.

No significant fauna species were recorded, however six significant fauna species are known to occur within the vicinity of the additional survey area (GHD 2020), and an additional three significant fauna species are considered likely to occur. Within the additional survey areas, one fauna habitat type was recorded.

Regards

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## 5. References

Environmental Protection Authority (EPA) (2016). Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment, Perth, Environmental Protection Authority.

Environmental Protection Authority (EPA) 2020, Technical Guide – Terrestrial Fauna Surveys, EPA, Perth, WA.

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GHD Pty Ltd (2022). Maitland to Karratha Terminal Flora and Fauna Survey. Unpublished report prepared for Horizon Power.

Western Australian (WA) Herbarium 1998–, FloraBase—the Western Australian Flora, Biodiversity, Conservation and Attractions, retrieved August 2021, from <http://florabase.dpaw.wa.gov.au/>.

# Appendices

# Appendix A

## Figures

*Figure 1*      *Location of additional survey areas*

*Figure 2*      *Vegetation types*

*Figure 3*      *Vegetation condition*

*Figure 4*      *Significant vegetation*

*Figure 5*      *Significant flora*

*Figure 6*      *Fauna habitat*

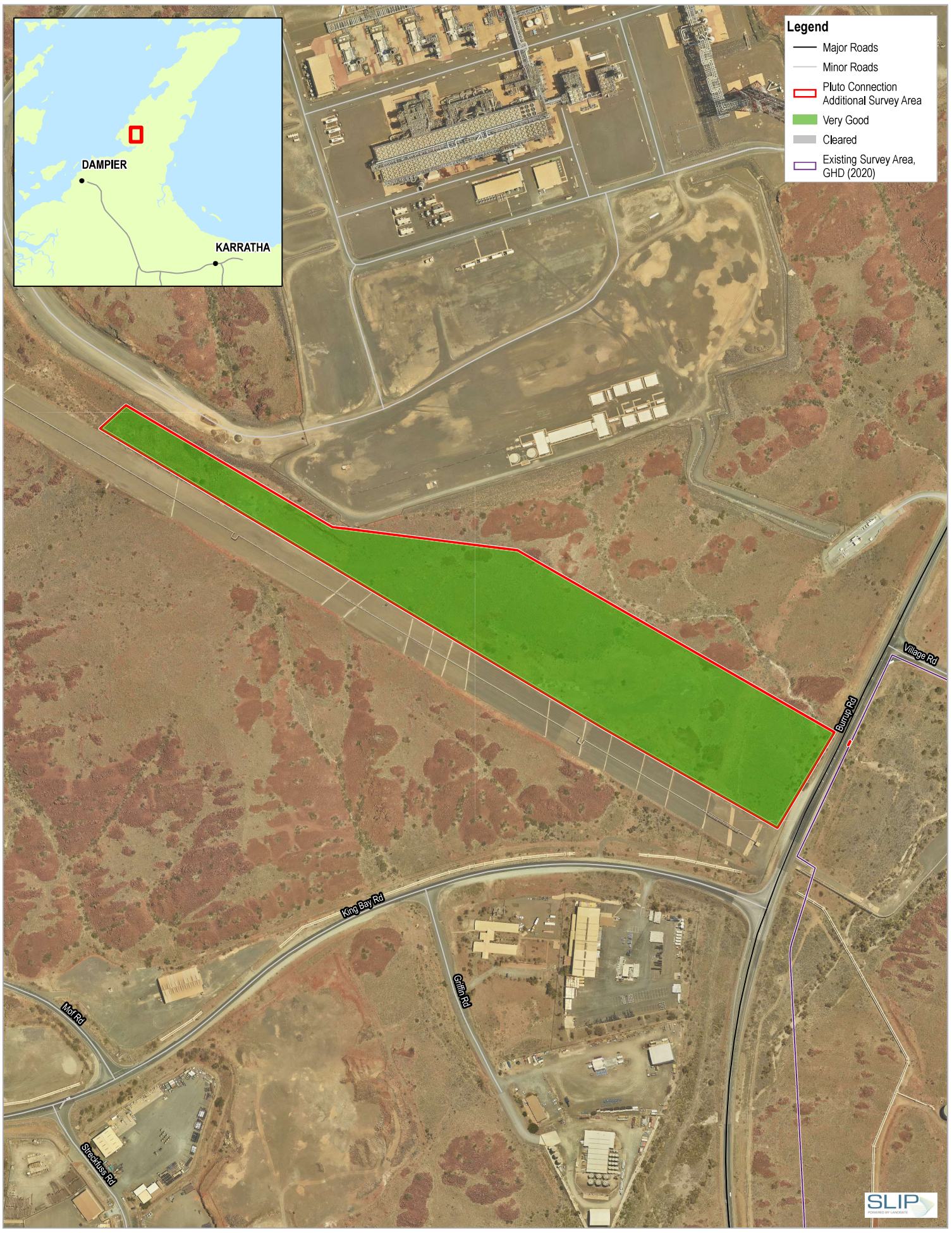












Paper Size ISO A3  
0 30 60 90 120  
Meters

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



Horizon Power  
Burrup Expansion Program  
Vegetation Condition Pluto  
Additional Survey Areas

Project No. 12582802  
Revision No. 0  
Date 19/10/2022

**FIGURE 3**







