



CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 9715/1
Permit Holder:	Regional Power Corporation trading as Horizon Power
Duration of Permit:	From 16 September 2023 to 16 September 2029

The permit holder is authorised to clear *native vegetation* subject to the following conditions of this permit.

PART I – CLEARING AUTHORISED

1. Clearing authorised (purpose)

The permit holder is authorised to clear *native vegetation* for the purpose of overhead powerlines, access tracks and associated infrastructure.

2. Land on which clearing is to be done

Lot 567 on Deposited Plan 28209, Burrup
Lot 571 on Deposited Plan 28209, Burrup
Lot 568 on Deposited Plan 28209, Burrup
Lot 644 on Deposited Plan 28840, Burrup
Lot 3013 on Deposited Plan 42282, Burrup

3. Clearing authorised

The permit holder must not clear more than 2 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.

PART II – MANAGEMENT CONDITIONS

4. Avoid, minimise, and reduce impacts and extent of clearing

In determining the *native vegetation* authorised to be cleared under this permit, the permit holder must apply the following principles, set out in descending order of preference:

- (a) avoid the clearing of *native vegetation*;
- (b) minimise the amount of *native vegetation* to be cleared; and
- (c) reduce the impact of clearing on any environmental value.

5. Weed management

When undertaking any clearing authorised under this permit, the permit holder must take the following measures to minimise the risk of introduction and spread of *weeds*:

- (a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
- (b) ensure that no known *weed*-affected soil, *mulch*, *fill*, or other material is brought into the area to be cleared; and
- (c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

6. Vegetation management – significant ecological communities

Prior to undertaking any clearing authorised under this permit, the permit holder shall:

- (a) demarcate 50 metre buffers in *hard copy* and *digital format* around the mapped Priority 1 Burrup Peninsula rock pile communities, cross-hatched red in Figure 2 of Schedule 2; and
- (b) ensure that no *clearing* of *native vegetation* occurs within 50 metres of the mapped Priority 1 Burrup Peninsula rock pile communities cross-hatched red in Figure 2 of Schedule 2.

7. Flora management

Prior to undertaking any clearing authorised under this permit, the permit holder shall:

- (a) demarcate the area to be cleared; and
- (b) any *Vigna triodiophila* individuals within the area demarcated under condition 7(a), shall be flagged for avoidance, where practicable.

8. Fauna management - Directional clearing

The permit holder shall conduct clearing in a slow progressive manner in a single direction towards adjacent *native vegetation* to allow fauna to move into adjacent *native vegetation* ahead of the clearing activity.

9. Revegetation and rehabilitation – retention of vegetative material and topsoil

The permit holder must:

- (a) retain the vegetative material and topsoil removed by *clearing* authorised under this permit and stockpile the vegetative material and topsoil in an area that has already been cleared;
- (b) as soon as is practicable, and no later than 12 months following *clearing* authorised under this permit, *revegetate* and *rehabilitate* the areas that are no longer required for overhead powerlines, access tracks and associated infrastructure by:
 - (i) re-shaping the surface of the land so that it is consistent with the surrounding five metres land;
 - (ii) ripping the ground on the contour to remove soil compaction;
 - (iii) laying the vegetative material and topsoil retained under condition 9(a) on the cleared areas; and

- (iv) undertake *weed* control activities on an ‘as needed’ basis to reduce *weed* cover within the cleared areas to no greater than the *weed* cover within the adjacent *native vegetation*.

10. Wind erosion management

The permit holder must commence construction of the overhead powerlines, access tracks and associated infrastructure no later than three (3) months after undertaking the authorised clearing activities to reduce the potential for wind erosion.

PART III - RECORD KEEPING AND REPORTING

11. Records that must be kept

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	<ul style="list-style-type: none"> (a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA20), expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the size of the area cleared (in hectares); (e) actions taken to avoid, minimise, and reduce the impacts and extent of <i>clearing</i> in accordance with condition 4; and (f) actions taken to minimise the risk of the introduction and spread of <i>weeds</i> and <i>dieback</i> in accordance with condition 5.
2.	In relation to vegetation management pursuant to condition 6	<ul style="list-style-type: none"> (a) actions taken to avoid <i>clearing</i> within 50 metres of the mapped Priority 1 Burrup Peninsula rock pile communities.
3.	In relation to flora management pursuant to condition 7	<ul style="list-style-type: none"> (a) actions taken to avoid any <i>Vigna triodiophila</i> individuals
4.	In relation to the <i>revegetation</i> and <i>rehabilitation</i> of areas pursuant to condition 9 of this permit	<ul style="list-style-type: none"> (a) the location of any areas <i>revegetated</i> and <i>rehabilitated</i>, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 2020 (GDA2020), expressing the

No.	Relevant matter	Specifications
		<p>geographical coordinates in Eastings and Northings or decimal degrees;</p> <p>(b) a description of the <i>revegetation</i> and <i>rehabilitation</i> activities undertaken;</p> <p>(c) the date that the area was <i>revegetated</i> and <i>rehabilitated</i>;</p> <p>(d) the size of the area <i>revegetated</i> and <i>rehabilitated</i> (in hectares).</p>

12. Reporting

- (a) The permit holder must provide to the *CEO* on or before 30 June of each year, a written report:
- (i) of records required under condition 11 of this permit; and
 - (ii) concerning activities done by the permit holder under this permit between 1 January to 31 December of the preceding calendar year.
- (b) If no clearing authorised under this permit was undertaken between 1 January to 31 December of the preceding calendar year, a written report confirming that no clearing under this permit has been carried out, must be provided to the *CEO* on or before 30 June of each year.
- (c) Prior to 16 June 2029, the permit holder must provide to the *CEO* a written report of records required under condition 12 of this permit where these records have not already been provided under condition 12(a) of this permit.

DEFINITIONS

In this permit, the terms in Table 2 have the meanings defined.

Table 2: Definitions

Term	Definition
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the <i>Environmental Protection Act 1986</i> .
clearing	has the meaning given under section 3(1) of the EP Act.
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
digital format	provision of shapefiles to be utilised using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees
department	means the department established under section 35 of the <i>Public Sector Management Act 1994</i> (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	<i>Environmental Protection Act 1986</i> (WA)
fill	means material used to increase the ground level, or to fill a depression.
hard copy	provision of paper maps

Term	Definition
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
priority flora	means those plant taxa associated with that specific priority flora classification.
rehabilitate/ed/ion	means actively managing an area containing native vegetation in order to improve the ecological function of that area
revegetate/ed/ion	means the re-establishment of a cover of <i>local provenance</i> native vegetation in an area using methods such as natural regeneration, <i>direct seeding</i> and/or <i>planting</i> , so that the species composition, structure and density is similar to pre-clearing vegetation types in that area
weeds	means any plant – <ul style="list-style-type: none"> (a) that is a declared pest under section 22 of the <i>Biosecurity and Agriculture Management Act 2007</i>; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.

END OF CONDITIONS



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Mincham
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Ryan Mincham
MANAGER
NATIVE VEGETATION REGULATION

*Officer delegated under Section 20
of the Environmental Protection Act 1986*

24 August 2023

Schedule 1 - Plan 9715/1

The boundary of the area authorised to be cleared is shown in the map below (Figure 1).

Plan 9715/1

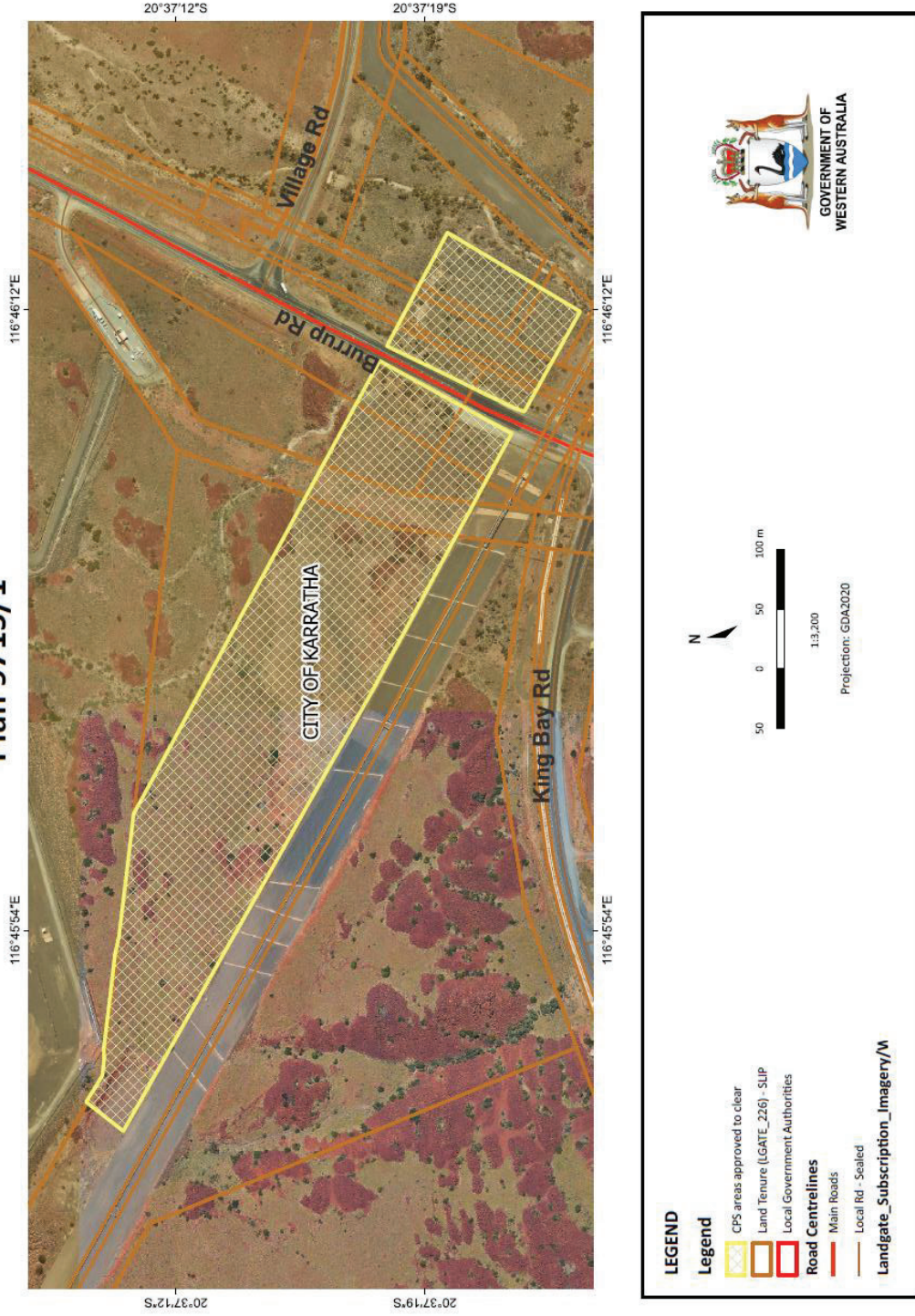
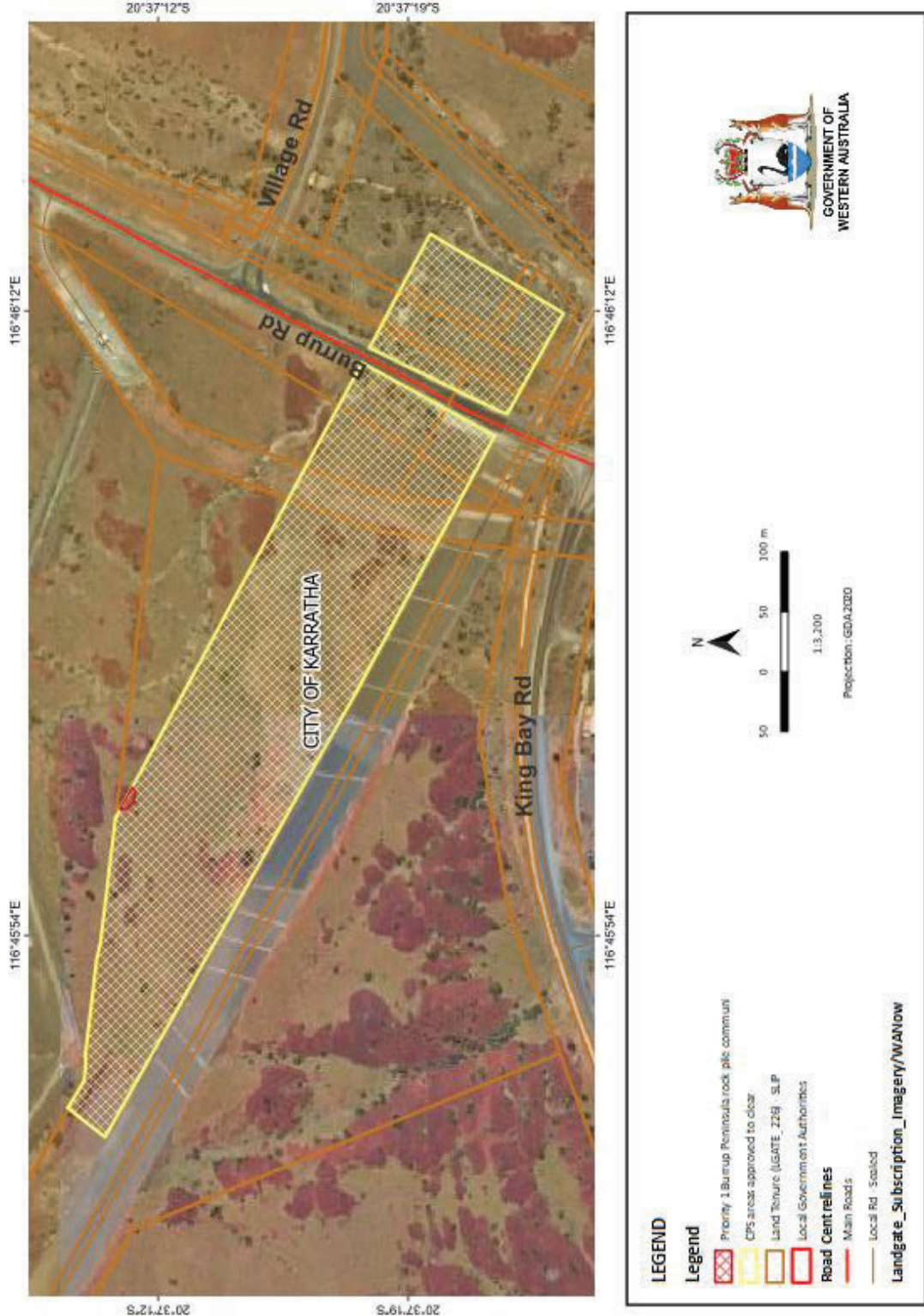


Figure 1: Map of the boundary of the area within which clearing may occur

Schedule 2

Figure 2: Map of the boundaries where no clearing of native vegetation is to occur within 50 metres of the mapped Priority 1 Burrup Peninsula rock pile communities (area cross-hatched red)





Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 9715/1
Permit type:	Purpose permit
Applicant name:	Regional Power Corporation trading as Horizon Power
Application received:	26 April 2022
Application area:	No more than 2 hectares (ha) of native vegetation within a 9.06 ha clearing footprint
Purpose of clearing:	Overhead powerlines, access tracks and associated infrastructure
Method of clearing:	Mechanical removal
Property:	Lot 567 on Deposited Plan 28209 Lot 571 on Deposited Plan 28209 Lot 568 on Deposited Plan 28209 Lot 644 on Deposited Plan 28840 Lot 3013 on Deposited Plan 42282
Location (LGA area):	City of Karratha
Localities (suburb):	Burrup

1.2. Description of clearing activities

The applicant (Regional Power Corporation trading as Horizon Power) is proposing to install overhead powerlines, access tracks and associated infrastructure within multiple land parcels on the Burrup Peninsula, Western Australia (WA) (the Project) (Horizon Power, 2022b). The Project will provide a proof-of-concept customer connection via an approximately 600 metre, 33 kilovolt (kV) distribution line which will connect into the existing Horizon Power network, which runs along the eastern side of Burrup Road, Karratha (Horizon Power, 2022b).

The vegetation proposed to be cleared is distributed across two separate areas, separated by Burrup Road (see Figure 1, Section 1.5). As advised by the applicant, the application area includes both temporary and permanent clearing, as described below:

Permanent mechanical clearing is required for the following:

- Steel pole footings
- Construction of the H structures
- Installation of the stay wires
- Access tracks.

Temporary clearing will also be required for the following:

- Winch sites – winch sites may be required at each end of the overhead distribution line depending on the selected installation methodology
- Machinery and vehicle movements
- Laydown areas (Horizon Power, 2022b).

Following the completion of the ('Burrup Peninsula Rock Pile') Priority Ecological Community (PEC) survey completed by Vicki Long and Associates (VLA, 2023), the applicant revised the original clearing footprint (Development Envelope) from 9.74 hectares to 9.06 hectares (Horizon Power, 2023c) (see Figure 2, Appendix E). Note: the actual clearing area remains limited at no more than 2 hectares within the clearing footprint (see Section 1.5 below).

1.3. Decision on application

Decision:	Granted
Decision date:	24 August 2023
Decision area:	2 hectares of native vegetation, as depicted in Section 1.5, below.

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). DWER advertised the application for 21 days and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix B), relevant datasets (see Appendix 0), the findings of biological surveys (see Appendix A and Appendix E), the clearing principles set out in Schedule 5 of the EP Act (see Appendix C), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3.3).

The assessment identified that the proposed clearing will result in:

- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values;
- potential mortality of conservation significant fauna utilising the application area;
- the loss of individuals from three priority flora species; (*Rhynchosia bungarensis* (P4), *Terminalia supranitifolia* (P3) and *Vigna triodiophila* (P3));
- potential risk of land degradation in the form of wind erosion.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing is unlikely to lead to appreciable land degradation or have long-term adverse impacts on nearby vegetation and fauna habitats. Potential impacts on the above-mentioned environmental values can be minimised and managed to unlikely to lead to an unacceptable risk to the environmental values. The applicant has suitably demonstrated avoidance and minimisation measures.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise to reduce the impacts and extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds;
- instate clearing buffers of 50 metres around the Priority 1 'Burrup Peninsula rock pile communities' Priority Ecological Community (PEC);
- demarcate the areas to be cleared and avoid *Vigna triodiophila* individuals, where practicable;
- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity;
- commencing construction works within three (3) months of authorised clearing; and
- revegetate cleared areas by returning vegetative material and topsoil removed by clearing to the areas no longer required.

1.5. Site map

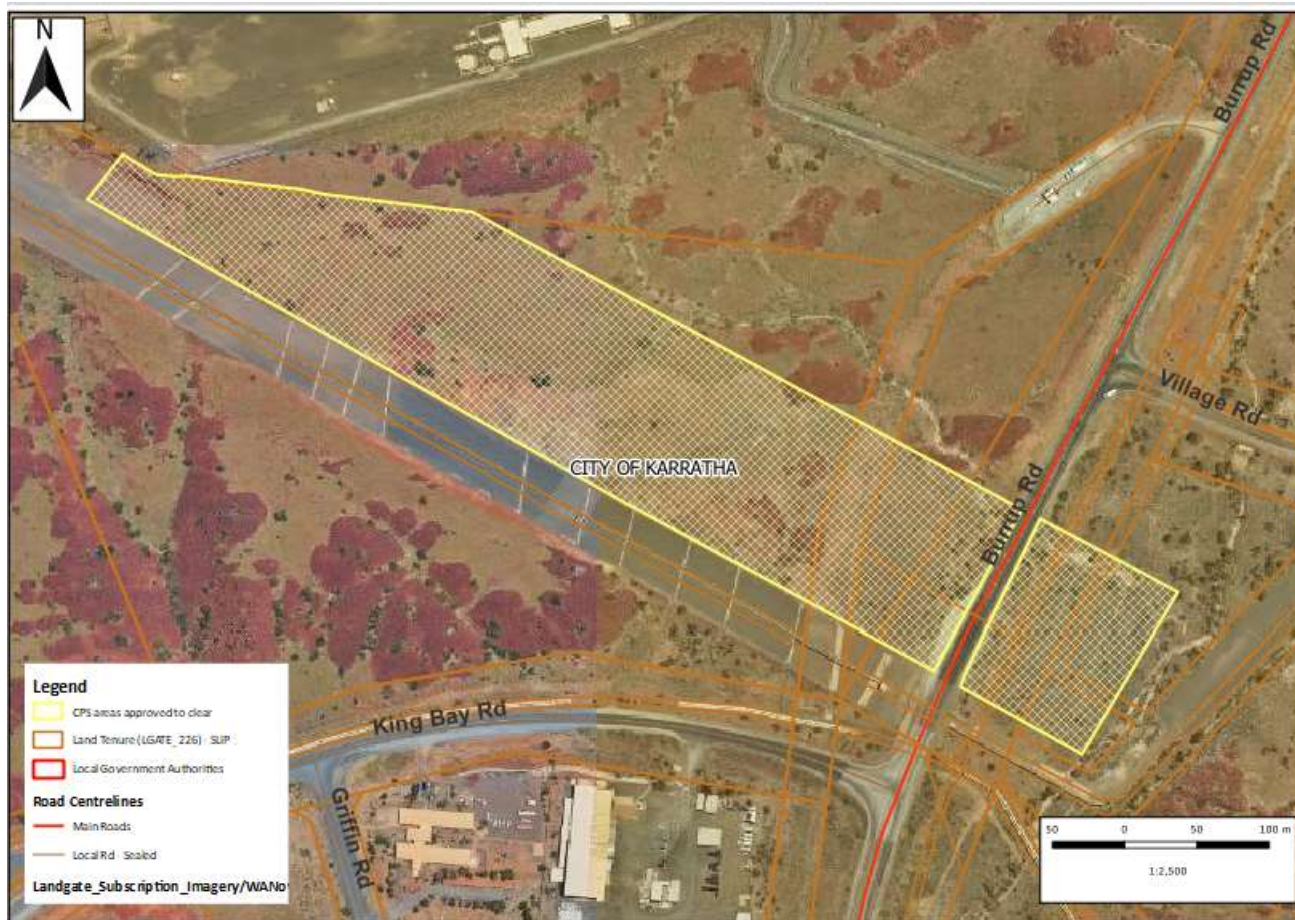


Figure 1 - Map of the application area

The areas cross-hatched yellow indicates the areas authorised to be cleared under the granted clearing permit.

2 Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004* (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the polluter pays principle
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2019)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016)

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

The following avoidance and minimisation measures have been considered by the applicant during the design of the proposed clearing area (Horizon Power, 2022a):

- The applicant examined the possibility of installing the customer connection through horizontal boring, however, this was discounted due to the hard lithology of the area. There are no existing access tracks or disturbed areas that can be used to avoid vegetation clearing,
- The vegetation type in the area is low lying and with the use of steel poles, Horizon Power will not be required to maintain a cleared vegetation maintenance zone for safety and bushfire purposes. A minimal cleared area around each pole will be kept for safe access during maintenance and response to faults,
- Horizon Power operates and maintains an extensive electrical network on the Burrup Peninsula and has recently completed realignment works on the main Burrup transmission line. This has provided Horizon Power with a detailed understanding of the sensitivity of the area, in particular rock piles as threatened fauna habitat. Pole placement will be selected to avoid any disturbance, modification or clearing to rock pile communities. These areas are considered to be no-go zones for design and construction, and
- It is noted that Horizon Power has commenced stakeholder consultation with the Murujuga Aboriginal Corporation (MAC) to ensure identification of heritage sites or areas of significance are identified and incorporated into the design. It is a Horizon Power requirement that heritage monitors are present during all ground disturbing works (Horizon Power, 2022a).

The Project infrastructure will be located a suitable safe distance from the existing gas pipeline to the south of the application area and allowing space for future pipeline development. The application area has subsequently been selected in the context of these existing land uses and is considered optimal for the installation of new infrastructure required for the Project (Horizon Power, 2022b).

With regards to engineering methods, the applicant advised that due to the lithology of the area, horizontal boring was discounted as a viable option. Overhead distribution lines were subsequently selected as the viable option (Horizon Power, 2022b). By using steel poles, the applicant will be required to maintain only a minimal cleared area around each pole to enable safe access during maintenance and repair works. This is compared to the use of wooden poles which require a larger area to be maintained cleared for safety and bushfire mitigation purposes (Horizon Power, 2022b).

The applicant advised that due to the location of existing Horizon Power and customer infrastructure, competing land uses and existing utilities in the area, locating infrastructure for the Project was highly constrained and that the applicant is managing multiple design considerations, with respect to the Project including:

- Extreme topography - the span between poles two (2) and three (3) being approximately 300 metres is to facilitate the spanning of a significant gully that exists between them;
- Engineering constraints - the above span has been optimised to reduce overall impact, span cannot be increased without a significantly increasing the pole heights and diameter. MAC has requested that visual impacts from infrastructure are minimised, increasing pole size would not be consistent with this guidance;
- The location of pole/pad three overlaps a previously disturbed area, which has regrown, but is evident from the aerial imagery;
- Clearing footprint - spanning the gully minimises the number of poles required and thus minimises the associated clearing impact. A previous design did not span the gully and involved significant additional access tracks, bulk civils and multiple retaining walls resulting in a greater overall environmental impact.
- Heritage constraints exist across the application area - the line design has been optimised to avoid identified heritage locations and minimise environmental impact, at MAC's direction. Specifically, pole/pad three has been designed to avoid a location to the North and the span between poles two and three facilitates the avoidance of several identified heritage sites in the gully (Horizon Power, 2023c).

Following the Targeted PEC survey undertaken by VLA (2023), the applicant revised the original clearing footprint (Development Envelope) on 31 August 2023 from 9.74 hectares to 9.06 hectares to avoid further priority flora individuals, Priority Ecological Community 'Burrup Peninsula Rock Piles' and Aboriginal Heritage sites (Horizon Power, 2023c) (see Figure 1, section 1.5 and Figure 2, Appendix E). The actual clearing area remains limited at no more than 2 hectares within the clearing footprint (see Figure 1, Section 1.5 above).

Additionally, the applicant has since advised they can commit to no clearing of the Priority Ecological Community (PEC) within the application area, as well as the instatement of a 50-metre buffer which will be demarcated around the PEC within the application area (Horizon Power, 2023).

In addition to the above, the applicant has advised that a draft construction management plan (CEMP) has been developed to outline environmental management measures to be implemented during the construction activities for the Project. The CEMP includes clearing constraints, flora, fauna, weed management, waste and clearing minimisation strategies as a minimum (Horizon Power, 2022b). Further review of the draft CEMP is noted to include the following management measures to manage dust, erosion and spread of weeds during the construction activities:

Flora and Vegetation:

- Clearing of native vegetation will be restricted to the application area (i.e. approved clearing area), as per the Native Vegetation Clearing Permit issued by DWER,
- Clearing of native vegetation will occur as per the conditions in the Native Vegetation Clearing Permit issued by DWER,
- No clearing of native vegetation or ground disturbance is to occur outside of the application area,
- Priority flora species within the application area will be avoided where possible, and is only to be undertaken as permitted by the Native Vegetation Clearing Permit issued by DWER,
- Areas that are degraded, sparsely vegetated and/or previously cleared will be used preferentially for the location of infrastructure and access roads required for the Project,
- Temporarily cleared areas will be restored through basic management measures, as follows:
 - Topsoil (i.e. the top 10 millimetres of soil) will be separately stockpiled and re-spread over temporarily cleared areas,
 - On completion of any temporary excavations, excavated materials will be replaced. Topsoil will then be re-spread over the surface, and
 - Recontouring and removal of compaction (e.g. ripping or scarification) of soil within areas temporarily disturbed by construction will occur (Horizon Power, 2022b).

Fauna:

- Clearing of native vegetation will be undertaken in a slow, progressive manner in one direction to allow fauna to move away from the clearing area,
- Clearing of areas of PEC (rock boulder / pile / outcrop habitat) will not be undertaken,
- Clearing of areas of will not be undertaken without prior visual inspection for fauna,
- Clearing will occur slowly to allow any fauna not identified during visual inspection to move away,
- Construction personnel will be provided with fauna identification materials for relevant conservation significant species (including for the Northern Quoll, Pilbara Olive Python and Peregrine Falcon) for on-site identification and active avoidance,
- Construction personnel are not permitted to touch, feed or otherwise interact with fauna,
- Any excavations left open overnight will include fauna egress and be inspected at the start and end of each day for fauna, and
- Vehicle and machinery speeds within the application area will be restricted to reduce the likelihood of fauna strike (Horizon Power, 2022b).

Weeds:

The following steps will be implemented to minimise the risk of disease and/or weeds being introduced and/or spread within the application area:

- The Contractor must ensure that no weed-affected soil, mulch, fill or other material is brought into the application area,
- Vehicles and machinery must be clean on entry, and
- Movement of machines and other vehicles will be limited, where possible, to the areas to be cleared (Horizon Power, 2022b).

Dust:

The following steps will be implemented to minimise the risk of dust spread within the and outside of the application area:

- Standard construction dust control and mitigation measures will be implemented during clearing. This may include the use of water truck(s), and
- Ground disturbance and/or clearing of vegetation will be restricted during high winds if dust cannot be adequately controlled (Horizon Power, 2022b).

Erosion:

- Standard construction measures regarding erosion and sediment control (include topsoil management) will be implemented during construction works (Horizon Power, 2022b).

Heritage:

- Heritage sites should be adequately demarcated on site, as relevant,
- Heritage Monitors must be present during ground disturbing activities,
- No ground disturbance or clearing is to be undertaken without Heritage Monitors present, unless otherwise specifically advised by Horizon Power, and
- Should artefacts or remains be uncovered during construction works, works are to stop immediately. The Contractor is to contact the Horizon Power Project Manager, the area should be cordoned off and no access permitted to the area (Horizon Power, 2022b).

It is noted the draft CEMP also includes management measures for noise and waste aspects considered within the construction (Horizon Power, 2022b).

A Horizon Power Environment Specialist will be onsite prior to works to ensure demarcation of sensitive areas and during clearing to ensure adherence to the Construction Management Plan (Horizon Power, 2022b).

The Delegated Officer was satisfied that the applicant has undertaken reasonable measures to avoid and minimise potential impacts of the proposed clearing on environmental values.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix B) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles (see Appendix C) identified that the impacts of the proposed clearing present a risk to biological values and or land resources. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Environmental value: biological values (biodiversity) – Clearing Principle (a)

Assessment:

Overview of survey work

GHD completed two surveys over the application area, which included the Burrup Expansion Project – Flora and Vegetation survey, conducted between 23 to 28 April 2020, to delineate key flora and vegetation values and potential impact to areas of sensitivity (GHD, 2020). This survey area covers the south-eastern section of the application area (along with a greater area outside the application area). The GHD Additional Areas Flora and Fauna Reconnaissance / Basic survey, conducted on between 3 to 4 August 2022, was a response to the GHD 2020 survey, to expand vegetation mapping, vegetation condition mapping and fauna habitat mapping in previously unsurveyed areas of the application area (GHD, 2022b). Searches for significant flora and fauna species were also undertaken within the Reconnaissance / Basic survey (GHD, 2022b). This survey covers the north-western side of the Burrup Road (the largest section of the application area). Additionally, the Burrup Peninsula Interconnector Pipeline Flora and Fauna Survey conducted by Astron Environmental Services Pty Ltd (Astron, 2018) on 7 to 8 June 2018, was also completed outside of the application area, but provided some further regional context, noting the survey was approximately 5 kilometres in length (and 50 metres in width).

After DWER's review of the Reconnaissance / Basic Survey (GHD, 2022b), additional information from the applicant and expert advice from the Department of Biodiversity, Conservation and Attractions (DBCA), was requested to inform its assessment of environmental impacts to the Priority 1 'Burrup Peninsula Rock Pile' Communities PEC (DBCA, 2023a; 2023b). DWER notified the applicant that the diagnostic criteria applied by GHD (2022b) to identify the PEC was not considered sufficient by DBCA, and that clarification was required to identify if the PEC was present on site and the scale of impact to the PEC from the proposal.

In response to the above, the applicant commissioned Vicki Long & Associates (VLA, 2023) to conduct a Targeted PEC survey on 8 May 2023. In undertaking the survey VLA (2023) survey, it was noted that the abundance of priority flora species was greater than the GHD 2022(b) survey report and that there were inaccuracies in the description of vegetation types and condition. For the purpose of this assessment, the applicant requested that the Targeted PEC Survey conducted by VLA (2023) supersede the previous GHD (2022b) survey report due to discrepancies in the findings for flora species, vegetation type and condition (Note: as the VLA survey did not assess fauna habitats,

the applicant has advised that the survey data for fauna habitats from the GHD, 2022(b) survey still be utilised (Horizon Power, 2023b)).

Further survey information provided by the applicant can be found in Appendix A and E.

Vegetation types

The proposed clearing area is within the Pilbara bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA). The application area is located over the Abydos Plain-Roebourne vegetation association 117, which is described as hummock grasslands, grass steppe; soft spinifex (Government of Australia, 2019). The application area is approximately 796 metres in length and while separated by the Burrup Road reserve, is part of an expansive tract of native vegetation.

The GHD (2020) and (2022b) surveys originally identified three vegetation types over the original application area.

As per the Targeted PEC survey (VLA, 2023), the vegetation within the proposed clearing area consists of six vegetation types:

- ***AjSa*Cc** - *Aerva javanica* low shrubland, with *Salsola australis* over **Cenchrus ciliaris* tussock grassland with patchy *Cymbopogon ambiguous* (3.27 hectares / 36.13 per cent of the application area);
- **BaTsAclc** - *Brachychiton acuminatus*, *Terminalia supranitifolia*, *Acacia coriacea*, *Ipomea costata* with scattered *Triodia epactia*, *Cymbopogon ambiguous* / **Cenchrus ciliaris* tussocks (0.33 hectares / 3.62 per cent of the application area);
- **Ch+AtTe*Cc** - *Corymbia hamersleyana* low woodland with scattered *Brachychiton acuminatus*, *Ehretia saligna* over +*Acacia trachycarpa* open shrubland over *Triodia epactia* and **Cenchrus ciliaris* grassland (0.25 hectares / 2.76 per cent of the application area);
- **GpAcTe** - *Grevillea pyramidalis*, *Acacia coriacea* tall shrubland over *Acacia bivenosa*, *A. morrisonii*, *Hakea loreus subsp.loreus* open shrubland over *Triodia epactia* hummock grassland with patchy *Triodia angusta* and **Cenchrus ciliaris* (1.21 hectares / 13.35 per cent of the application area);
- **GplmTe** - *Grevillea pyramidalis* tall open shrubland over *Indigofera monophylla* open low shrubland over *Triodia epactia* hummock grassland (3.60 hectares / 39.70 per cent of the application area);
- **TcTaTe** - *Terminalia circumulata* low woodland over *Indigofera monophylla* low scattered shrubs over *Triodia angusta* and *Triodia epactia* hummock grassland (0.07 hectares / 0.74 per cent of the application area).

It is noted that an additional area of 0.34 hectares (3.71 per cent) of application area is already cleared (VLA, 2023). See Appendix E for biological survey excerpts.

As per the Targeted PEC survey report, the vegetation condition within the proposed clearing area varies from Completely Degraded to Very Good (Trudgen, 1991) condition (VLA, 2023).

Flora

According to available databases, 19 priority flora species listed by DBCA and no threatened flora listed under the EPBC Act or BC Act were identified within the 50-kilometre radius of the application area. Based on the similarities shared between the soil and vegetation types in habitats for these flora taxa and within the application area, it was determined that that four flora species have the potential to occur over the application area. These species are *Eragrostis surreyana* (P3), *Rhynchosia bungarensis* (P4), *Terminalia supranitifolia* (P3) and *Vigna triodiophila* (P3) (see Appendix B.3).

The Flora & Vegetation Survey (GHD, 2020) did not record any threatened or priority flora species within the application area. However, the Pluto Additional Areas Reconnaissance/Basic Survey (GHD, 2022b) recorded one (1) individual of *Rhynchosia bungarensis* at one location, 11 individuals of *Terminalia supranitifolia* at one location and 37 individuals of *Vigna triodiophila* at 21 locations. No records of *Eragrostis surreyana* were found. A number of these priority flora species were additionally found outside of the application area, based on surveys conducted by GHD (2020; 2022a) and Astron (2018).

The original proposed clearing identified the loss of one *Rhynchosia bungarensis* individual, 11 *Terminalia supranitifolia* individuals and 37 *Vigna triodiophila* individuals within the application area. DBCA advice was requested in relation to the impacts to these priority flora species.

DBCA advice was received in relation to the loss of one *Rhynchosia bungarensis* individual and 11 *Terminalia supranitifolia* individuals within the application area. With DBCA advising that the taking of one *Rhynchosia*

bungarensis individual is unlikely to be significant and that *Terminalia supranitifolia* is known from approximately 20 collections within five kilometres of the application area, with over 110 plants in the local population, therefore the taking of 11 plants is also unlikely to be significant (DBCA, 2023a).

As previously discussed above, in response to the DBCA advice in relation to the PEC and priority flora (DBCA, 2023a and 2023b), the applicant commissioned Vicki Long & Associates (VLA, 2023) to undertake the Targeted PEC survey on 8 May 2023.

The Targeted PEC survey (VLA, 2023) identified that the abundance of the priority flora species was found to be greater than the GHD 2022(b) survey report.

As above, following the undertaking of the Targeted PEC survey, the applicant revised the application area in the assessment phase (see Figure 1 in section 1.5 and Figure 2 in Appendix E).

DWER's assessment has concluded that from the data collected within the GHD (2020) survey, Astron (2018) survey and VLA (2023) survey, the proposed clearing has potential to impact on:

- Three (3) *Rhynchosia bungarensis* (P4) individuals from three locations recorded within the proposed clearing area, with 89 individuals from 23 locations recorded outside the application area;
- Eight (8) *Terminalia supranitifolia* (P3) individuals from five locations recorded within the proposed clearing area, with 118 individuals from 95 locations recorded outside the application area; and
- Approximately 250 *Vigna triodiophila* (P3) individuals from three locations recorded within the proposed clearing area, with 16 individuals from 6 locations recorded outside the application area.

In addition, according to available databases within the local area (50-kilometres), 46 individuals of *Rhynchosia bungarensis* (P4) at 39 locations, 46 individuals of *Terminalia supranitifolia* (P3) from 47 locations and 74 individuals of *Vigna triodiophila* (P3) from 12 locations, have been recorded outside of the application area (Western Australian Herbarium 1998–).

Based on the above, the three *Rhynchosia bungarensis* individuals within the application area comprise of 2.17 percent of all individuals locally, eight *Terminalia supranitifolia* individuals within the application area comprise of 4.65 percent of all individuals locally and 250 *Vigna triodiophila* individuals within the application area comprise of 73.53 percent of all individuals surveyed locally.

Further advice was sought from DBCA on impacts to *Vigna triodiophila* (P3) individuals following the results of the VLA survey, given that the clearing was from 37 individuals to potentially impacting 250 individuals within the application area.

The applicant has advised that they are not proposing to impact all 250 estimated *Vigna triodiophila* individuals, only those within the design/construction area (Horizon Power, 2023e). The applicant has proposed to not quantify their impact because of the estimated numbers and estimated locations in the survey, and the advice received that it dies back to rootstock and may be undetectable during the year. At this stage, the proposed disturbance (indicative construction design) avoids a significant proportion of the estimated distribution based on the revised construction and design drawings (see Figure 14, Appendix E), and due to site constraints, pad three (3) is unlikely to be able to be moved north or east to impact a greater area of the estimated distribution (Horizon Power, 2023e).

Additional comments from the applicant advise that *Vigna triodiophila*'s recent discovery in the application area shows that the species is widespread with a reasonable distribution across the Burrup Peninsula and mainland (Horizon Power, 2023e). Reported favourable climatic conditions this year leading to the significant quantities estimated in the area, noting the vast difference in observed/estimated numbers in the application area between the GHD (August 2022) and VLA (May 2023) efforts. Whilst there is the potential to impact approximately 75 per cent of currently known records, the application area has been subjected to significant prior disturbance was estimated to be home to approximately 2.5 times the previously known plants (Horizon Power, 2023e). The applicant advises the above points are indicative of a lack of survey efforts around this species and it may not be reasonable to conclude that the proposed clearing is a significant impact to *Vigna triodiophila* populations.

Revised DBCA advice was requested on the above information, as well as the adequacy of the applicant's avoidance and mitigation and management measures. DBCA (2023c) advised that the impacts to 250 *Vigna triodiophila* plants from three locations appear to be significant locally. DBCA noted that the applicant intends to minimise the disturbance to the species, but the applicant's avoidance and mitigation measures does not detail how they intend to do this. However, DBCA have advised the species should continue to persist on the Burrup Peninsula but potentially in lower numbers, as the new data from WA Herbarium only recorded 16 individuals from six sites outside

the application area, with potentially more individuals that may exist since they are not easily identifiable when not actively growing (DBCA, 2023c).

DBCA advise that the species is still currently only known from locations, extending to approximately 225 kilometres east of the Burrup Peninsula, with the frequency of the individuals growing not always specified, but comments of this nature advise it tends to be relatively uncommon or approximately 20 plants per location (DBCA, 2023c). However, as above, DBCA advise given its cryptic nature when not growing actively, the species may occur in higher numbers, as demonstrated in the surveys (GHD, 2022b; VLA, 2023) within the application area. In summary, DBCA advise that the impact is unlikely to be significant at a regional or species level (DBCA, 2023c).

DBCA advise that areas where the *Vigna triodiophila* plants are growing within the application area should be demarcated in the field and clearing contractors should be informed of what the species look like, to avoid plants where possible (DBCA, 2023c). In addition, DBCA recommend that the parking of vehicles and other equipment, where works are not occurring should avoid areas where this species occurs (DBCA, 2023c).

The applicant's commitments/ management actions can be found above in section 3.1.

Ecological Communities

While the desktop assessment did not identify that there was any presence of mapped Threatened (TEC) or Priority Ecological Communities (PEC) over the application area, the Flora and Fauna Reconnaissance / Basic survey by GHD (2022b) identified that the application area is considered to represent the Priority 1 'Burrup Peninsula Rock Pile' Communities 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 (DBCA, 2023b).

Vegetation to the north-west of the Burrup Road road reserve was originally mapped as VT01 (over 80 per cent of the application area), which was thought to consist of *Brachychiton acuminatus* isolated low trees over *Grevillea pyramidalis* subsp. *pyramidalis*, *Terminalia supranitifolia* (Priority 3) and *Flueggea virosa* subsp. *melanthesoides* scattered to isolated shrubs over *Triodia epactia* and *T. wisea* open hummock grassland over *Cymbopogon ambiguus* and **Cenchrus ciliaris* open tussock grassland and *Tinospora smilacina* and *Ipomoea costata* open vineland on rock piles (GHD, 2022b). This vegetation type is noted to be in a Very Good (Trudgen, 1991) condition (GHD, 2022b).

Taking into account the findings of GHD's Flora and Fauna reconnaissance basic survey (GHD, 2022b), DWER identified that approximately 8.61 hectares of native vegetation within the original application area (see Figure 2, Appendix E) represents the Burrup Peninsula Rock Pile Communities PEC. DBCA advice was requested based on the information above in relation to PEC impacts.

Advice was received from DBCA in February 2023, whereby DBCA advised that based on the surveys undertaken by GHD, it is not clear whether the extent mapped as the PEC is based on the vegetation type (VT01) or individual rockpiles (DBCA, 2023b). DBCA advised that further clarification and mapping of the areas that constitute the PEC is required to determine local significance, including mapping of the individual rock piles throughout the whole development area is required to identify occurrences of the PEC and determine its local extent (DBCA, 2023b). Further regional surveys were recommended to assess and provide better local context of the PEC and that the individual rock piles should be mapped (DBCA, 2023b). DBCA additionally advised that once mapped, individual rock piles should be avoided within the application area, power poles should be placed in areas where rock piles are absent to avoid significant impacts to the PEC and an adequate buffer applied to prevent indirect impacts to the PEC – this should be added into providing further avoidance and mitigation measures (DBCA, 2023b).

As previously discussed above, in response to the DBCA advice in relation to the PEC (DBCA, 2023b), the applicant commissioned Vicki Long & Associates (VLA, 2023) to undertake a Targeted PEC survey on 8 May 2023.

VLA (2023) advise that the following criteria (taken from VLA 2013) were established in collaboration with DBCA to assist with the identification of Burrup Rockpile PECs, which include:

- Burrup Rockpile PECs must be located on the rockpile, outcrop, ridge or along the immediate base of the rockpile only;
- Burrup Rockpile PECs should have no grass cover or not more than scattered (less than 2 per cent of pocket); tussocks or hummocks of native grasses, and should not adjoin grassland;

- Vegetation associated with small rockpiles/outcrops on hummock grassland slopes is excluded;
- Single species, despite often covering a large area, are not included as a Burrup Rockpile PEC; and
- A minimum of four species with attributes according to the PEC description (includes a mixture of Kimberley, Pilbara and fire sensitive species) (VLA, 2023).

Based on the above criteria, three (3) Burrup Rockpile PECs were identified in the application area, however, two were degraded by buffel grass (weed invasion) and therefore cannot be considered a PEC. Another two (2) rockpiles were also identified, however, as they harboured single tree species, often large, spreading and covering a large area, these do not meet the criteria for a Burrup Rockpile PEC (see Figure 7, Appendix E) (VLA, 2023).

The only one (1) Burrup Rockpile PEC considered to meet the PEC criteria, is located at the very northern edge of the application area, representing 0.011 hectares) (see Figure 7, Appendix E) (VLA, 2023). This small PEC harboured species including the Kimberley remnant and fire sensitive species (*Brachychiton acuminatus*, *Ehertia saligna*, *Acacia coriacea*, *Ipomomea costata*, *Rhagodia eremea*, *Jasminum didymium* subspecies *lineare* with isolated *Cymbopogon ambiguss* and *Triodia epactia* grasses (VLA, 2023).

The applicant has advised that Horizon Power can commit to no clearing within 50 metres of the Burrup Rockpile PEC within the application area (Horizon Power, 2023e).

In addition, the most recent surveys GHD (2020) and VLA (2023) recorded five non-native flora species over, or immediately adjacent to, the application area including **Passiflora foetida* (Passionflower), **Cenchrus ciliaris* (Buffel Grass), **Aerva javanica* (Kapok), **Vachellia farnesiana* (Mimosa Bush), and **Tamarix aphylla* (Athel Pine). **Tamarix aphylla* is a Weed of National Significance (WoNS) and a declared pest under the *Biosecurity and Agricultural Management Act 2007*. Adjacent vegetation is susceptible to weed invasion which the clearing process may exacerbate, thereby reducing habitat quality. As such, the permit will impose weed management condition on the permit.

Conclusion:

The native vegetation proposed to be cleared is comprised of vegetation types and flora taxa typical to the region. Noting the size and context of the proposed clearing, and the avoidance and minimisation strategies provided by the applicant (Horizon Power, 2023e), the proposed clearing is unlikely to affect the Priority 1 Burrup Peninsula rock pile community or have a significant impact on Priority flora.

For the reasons set out above, and the avoidance and mitigation measures provided by the applicant (see Section 3.1), it is considered that potential impacts of the proposed clearing on flora and vegetation can be managed by avoiding the Priority 1 Burrup Peninsula Rockpile PEC and implementing appropriate weed control.

Conditions:

To address potential impacts to flora and ecological communities of conservation significance from the proposed clearing, the following management measures will be required as conditions on the clearing permit:

- No clearing within 50 metres of the Priority 1 Burrup Peninsula rock pile communities PEC;
- Demarcate the areas to be cleared and avoid *Vigna triodiophila* (P3) individuals where practicable; and
- Implement weed management measures to mitigate impacts to adjacent vegetation.

3.2.2. Environmental value: biological values (fauna) – Clearing Principle (b)

Assessment:

It should be noted that while the applicant advised DWER that the GHD 2022(b) survey findings for flora species, vegetation type and condition be superseded by the Targeted PEC Survey conducted by VLA (2023), as the VLA survey did not assess fauna habitats, the applicant has advised that the survey data for fauna habitats from the GHD, 2022(b) survey still be utilised (Horizon Power, 2023c)).

Fauna habitats

The Flora Fauna Reconnaissance / Basic survey conducted by GHD (2022b) identified one fauna habitat within the majority of application area, that could potentially support populations of conservation significant fauna:

- **Rocky Hills with exposed boulder piles** – described as 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 *Grevillea pyramidalis* subsp. *pyramidalis*, *Terminalia supranitifolia* (P3) and *Brachychiton acuminatus*. The *Terminalis*,

Brachychiton and *Grevilla* provided litter and scattered woody debris, however the boulder piles provide extensive cover via crevices, small caves and cavities) (8.61 hectares).

It should be noted that the eastern section of the application area was not surveyed as part of the GHD 2022(b) survey, however the rocky hills with exposed boulder piles is assumed to also be within the eastern part of the application area.

Fauna species

According to available databases, 60 conservation significant fauna species occur within a 50-kilometre radius of the application area, including 16 threatened species, 33 species protected under international agreements, two other specially protected species and nine priority species. The conservation significant fauna species include 42 birds, 11 mammals and seven reptiles. The majority of the birds identified from the local area are avian migratory birds associated with aquatic habitats and breed in northern latitudes. Noting the absence of wetlands or major watercourses within the application area, the proposed clearing is not likely to have a significant impact on the identified migratory birds or any other aquatic species identified from the local area.

No threatened or endangered fauna species listed under the EPBC Act or *Biodiversity Conservation Act* (BC Act), nor priority species listed by DBCA were found within the application area during the surveys (GHD, 2022b). However, there are a total of six fauna species that were identified in likelihood assessments and assessed to be regular visitors or residents, based on habitat preferences which include:

- *Dasyurus hallucatus* (Northern Quoll) (listed as Endangered under the EPBC Act and BC Act);
- *Falco peregrinus* (Peregrine Falcon) (listed as OS);
- *Liasis olivaceus barroni* (Pilbara olive python) (listed as Vulnerable);
- *Notoscincus butleri* (Lined soil-crevice skink (Dampier)) (listed as Priority 4);
- *Pseudomys chapmani* (Western pebble-mound mouse, ngadji (listed as Priority 4); and
- *Leggadina lakedownensis* (Northern short-tailed mouse, Lakeland Downs mouse, kerakenga) (listed as Priority 4).

Northern Quoll

The Northern Quoll occupies a diverse range of habitats including rocky areas, eucalypt forest and woodlands, shrubland and grassland (TSSC, 2005), but occurs predominantly in rocky habitat and often with gorges, breakaways and hills, with rugged rocky areas used for denning purposes, but can also occur along creek lines and beaches (Van Dyck and Strahan, 2008). This species is known from the Burrup Peninsula in low numbers (GHD, 2022b). The closest record of this species was identified 1.34 kilometres west of the application area from 2013 (DBCA, 2007-2022). Rocky areas of the BaTsAcic vegetation type, are potentially utilised by the Northern Quoll are present in the application area. Thus, it is likely that the occasional Northern Quoll will pass through the application area as a visitor, but not rely solely on the habitat within the application area (DAWE, n.d).

Peregrine Falcon

The Peregrine Falcon was identified from the local area may regularly overfly the application area. According to the Australian Museum, the Peregrine falcon 'is found in most habitats, from rainforests to the arid zone, and at most altitudes, from the coast to alpine areas. It requires abundant prey and secure nest sites and prefers coastal and inland cliffs or open woodlands near water and may even be found nesting on high city buildings. This species is widespread and highly mobile and is found in various habitats (Australian Museum, 2019). Given the breeding sites for the species is on rocky ledges, cliffs or tall trees, and the species preferred breeding habitat is absent over the application area, it is not likely that the application area will provide core habitat for the Peregrine falcon. However, the Peregrine Falcon may utilise the rocky areas of the BaTsAcic vegetation type within the application area as foraging habitat.

Pilbara Olive Python

This species is known to be restricted to ranges within the Pilbara region and Mount Augustus in the Gascoyne and is often recorded near waterholes and usually associated with rocky substates (DAWE, n.d). The Pilbara Olive Python is usually found in proximity to water, although breeding males and juveniles may disperse widely. An ambush predator that feeds predominately on mammals and birds (DAWE, n.d). The closest record of this species was identified 0.15 kilometres west of the application area from 2013 (DBCA, 2007-2022). Rocky areas of the BaTsAcic vegetation type within the application area, would be regarded as important habitat for the species and potentially utilised by the Pilbara Olive Python, are present in the application area. Thus, it is likely that the occasional Pilbara Olive Python will pass through the application area as a visitor, but not solely rely on the habitat within the application area.

Western pebble-mound mouse and Northern short-tailed mouse

These two species of mouse are associated with habitats from the monsoon tropical coast to semiarid climates, including spinifex and tussock grasslands, samphire and sedgeland, *Acacia* shrublands, tropical *Eucalyptus* and *Melaleuca* woodlands and stony ranges. Most habitats, however, are seasonally inundated on red or white sandy-clay soils. The two mouse species are nocturnal, largely solitary, and individuals spend the day in simple, single-chambered burrows. Given the abundance of potential habitats for the two mouse species in the local area, including vegetation immediately surrounding the application area, the proposed clearing is not considered to be locally significant for the survival of these species, should they be present within the application area. These two mouse species were not found in the fauna survey (GHD, 2022b). Thus, it is likely that these two mouse species may pass through the application area as visitors, but not solely rely on the habitat within the application area.

Lined soil-crevice skink

Over 50 records of the lined soil-crevice skink have been recorded in the local area. This reptile species is a poorly recorded species, habitat preference and ecology are poorly known but this species is thought to occur in spinifex-dominated areas near creeks and river margins (GHD, 2022b). Given no major creeks or rivers occur over the application area, it is unlikely that the application area will be considered suitable habitat for the Lined soil-crevice skink.

Conclusion:

No evidence of threatened, endangered or priority fauna species individuals were observed during the fauna survey. Each fauna species has a scattered distribution across northern Australia. No species of conservation significance are likely to be solely dependent on the habitats present within the application area, however, it is likely that the above listed species identified from the local area may occasionally use the application area for temporary refuge and dispersal between other areas of habitat. It is not expected that the application area comprises significant habitat for the aforementioned fauna species or is critical for the conservation of these fauna species.

Outcome:

Based on the above assessment and the avoidance and mitigation measures provided by the applicant (see section 3.1), the Delegated Officer has determined that the proposed clearing requires management conditions in relation to fauna values. For the reasons set out above, it is considered that direct impacts to conservation significant fauna species can be managed to be environmentally acceptable through the application of slow, directional clearing to the extent that the proposed clearing does not constitute a significant residual impact to fauna habitat values.

Conditions:

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- Conduct directional clearing in a slow progressive manner in a single direction towards adjacent native vegetation to allow fauna to move into adjacent native vegetation ahead of the clearing activity, to minimise impact to individuals.

3.2.3. Land and water resources (riparian vegetation) - Clearing Principle (f)

Assessment:

According to available datasets, there are no permanent watercourses or wetlands located within the area proposed to be cleared, however, the tail-end of only one minor non-perennial drainage line slightly intersects the application area. Drainage lines in this region are dry for most of the year, only flowing briefly immediately following significant rainfall.

The Flora Fauna Reconnaissance / Basic survey conducted by GHD (2022b) noted that there was no riparian vegetation recorded within the application area. Therefore, it is unlikely that the proposed clearing will impact on or off-site hydrology and water quality.

Conclusion:

Given that there is no riparian vegetation, permanent watercourses or wetlands located within the area proposed to be cleared, no significant impacts to these environmental values will occur. On this basis, no conditions will be required to be placed on the permit.

3.2.4. Land and water resources (land degradation) - Clearing Principle (g)

Assessment:

The application area is located within the Granitic land system, which is characterised by rugged granitic hills supporting shrubby hard and soft spinifex grasslands, with 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 (DPIRD, 2019). The topography ranges from 50 metres north-west to 10 metres in the south-east of the application area.

In regards to erosion, surface water is largely reliant on weather and waterways generally only flow for parts of the year, in response to larger cyclonic or rainfall events. Water erosion may occur as sheet flow in broad inter-drainage areas on alluvial plains, near the baselines of hills and ridges with the risk of soil erosion during rainfall events.

The application area, typical of the semi-arid region, may have a high dust load. Dust is known to accumulate on plants, particularly near to the source, and may affect the plant health and the nearby vegetation, even if temporarily. Research on the impacts of dust on plant health in the semi-arid and arid zones asserted that the accumulation of dust and impacts on plant health in the arid region are driven more by the variability of cumulative rainfall than dust load (Matsuki et.al., 2016). Clearing may increase the risks of dust deposition and land degradation. This may be exacerbated by the longer time required to clear and perform the construction works which would prolong the exposure of cleared ground to the wind.

With water scarcity and low rainfall in the area, watering of the cleared area to suppress dust is not practical. Noting the considerably limited area of clearing within the development envelope, and condition of vegetation cover surrounding the proposed clearing area, it is considered that although clearing may lead to some land degradation in the form of soil erosion and sediment and dust deposition, these impacts are likely to be minor and localised. Limiting the exposure time of cleared areas to wind and application of appropriate land management measures during clearing and construction works can mitigate the impact.

The applicant has advised that standard construction measures regarding erosion and sediment control, which includes topsoil management, will be implemented during construction works under their CEMP (Horizon Power, 2022b). In addition, the applicant has advised that temporarily cleared areas will be restored through basic management measures, as follows:

- Topsoil (i.e. the top 10 millimetres of soil) will be separately stockpiled and re-spread over temporarily cleared areas;
- On completion of any temporary excavations, excavated materials will be replaced. Topsoil will then be re-spread over the surface; and
- Recontouring and removal of compaction (e.g. ripping or scarification) of soil within areas temporarily disturbed by construction will occur (Horizon Power, 2022b).

The current surface water hydrology regime will be maintained. No increased incidence of flooding or erosion along the one minor drainage line that slightly intersects the application area is likely to occur due to the limited extent of clearing over the length of the application area with minimal sheet flow over a short time-scale, and adequate surrounding native vegetation to allow water to infiltrate (Horizon Power, 2022b).

The above construction procedures provided by the applicant could avoid and minimise the potential for wind and water erosion (see above 3.1 Avoidance and mitigation measures).

Conclusion:

Noting the landform of the application area, the extent and nature of the proposed clearing, the surrounding native vegetation and the condition of that vegetation, and the commitment by Horizon Power to employ erosion and sediment controls, the proposed clearing is not likely to cause appreciable land degradation and long-term land degradation and dust deposition provided appropriate land management measures are applied. However, the proposed clearing may facilitate the spread of weeds into adjacent retained vegetation in the local area.

For the reasons set out above, it is considered that the impacts of the proposed clearing can be managed to be environmentally acceptable by taking steps to minimise the risk of the introduction and spread of weeds and ensuring that construction activities are commenced within three (3) months after the authorised clearing.

A condition will also be placed on the permit whereby, the applicant will no later than 12 months following temporary clearing, revegetate and rehabilitate the areas that are no longer required for the purpose of overhead powerlines and vehicle maintenance access tracks.

Conditions:

To address the above impacts, the following management measures will be required as a condition on the clearing permit:

- commencement of construction works no later than three (3) months after authorised clearing;
- revegetate cleared areas by returning vegetative material and topsoil removed by clearing to the areas no longer required for the purpose for which they were cleared; and
- weed control, which ensures protocols are put in place to limit the introduction and transportation of weed-affected materials.

3.3. Relevant planning instruments and other matters

North West Interconnected System (NWIS)

The applicant is proposing to install a distribution line and associated infrastructure within multiple land parcels on the Burrup Peninsula, WA. This Project will deliver a customer connection (Woodside's Pluto LNG Plant) to the North West Interconnected System (NWIS) to provide for "proof of concept" testing for the customer. The Pluto LNG Plant will be the first standalone system to connect to the NWIS under the new regulatory regime for the NWIS initiated by the State through the Pilbara Reforms. Demonstrating the benefits that Woodside will obtain from being interconnected, along with demonstrating increased reliability and certainty that the new regime brings will be key in encouraging further isolated power systems in the Pilbara to connect to the NWIS (Horizon Power, 2022c).

The NWIS offers industrial proponents access to lower emission generation as well as several large scale emerging solar projects, including Woodside's proposed Maitland Solar Farm development. Land constraints on the Burrup Peninsula limit the feasibility of large-scale renewables, therefore the connection represents an important pathway for Woodside to progress its decarbonisation journey at its the Pluto LNG facility for decarbonisation. Without customer connections to the NWIS industrial proponents on the Burrup will not have access to large scale renewable energy sources (Horizon Power, 2022c).

City of Karratha

The City of Karratha (the City) have advised DWER that local government approvals are not required, and that the proposed clearing undertaken by Horizon Power for the development is likely to be considered 'public works' under the Publics works Act and in this instance would be exempt from requiring development approval under Section 6 of the *Planning and Development Act 2005*. The City advised they did not have any objections to the proposed clearing as long as the avoidance and mitigation measures proposed by Horizon Power (and outlined under Section 3.1) are implemented (City of Karratha, 2022).

Groundwater and Surface Water

The application area is located within the Pilbara Surface water area and the Pilbara Groundwater Area proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act) (DWER-037, DWER-034). There are no mapped rivers proclaimed under the RIWI Act in the vicinity, and the application area is not located within any *Country Areas Water Supply Act 1947* (CAWS Act) Clearing Control Catchments, or Public Drinking Water Source Areas (DWER-033).

Advice was obtained from DWER Northwest Region and Pilbara Licencing in relation to potential water quality impacts under the RIWI Act. The advice received is that Horizon Power do not hold any water licences over the application area (DWER, 2022a). However, the applicant has advised that no surface water or groundwater will be required to be taken for the proposed clearing, therefore no further permitting or licensing will be required by DWER.

Contaminated sites

DWER's Contaminated Sites Branch (CS) advised that an area of potential impact is within Lot 3013 on Deposited Plan 42282 was reported to the Department and deemed 'Awaiting Classification', which is related to nutrient concentrations in the tidal flats located within the southern portion of Lot 3013, as related to operations at the nearby plant, situated close by to Lot 3013 (DWER, 2022a). However, CS advised that the area of possible contamination is located cross-gradient, approximately 700 metres south of the area proposed to be cleared. It is noted the proposed clearing under CPS 9715/1 is located in the far northern portion of Lot 3013, therefore the application area is not expected to impact on or be impact by the reported area of potential impact (DWER, 2022a).

Acid sulfate soils (ASS)

ASS risk mapping indicates that the south-east portion of the application area is located within an area identified as representing a risk of ASS occurring within 3 metres of the natural soil surface, with a 'Moderate to Low' risk of containing ASS. Due to the nature of the clearing and, in particular, that groundwater is unlikely to be intercepted, the risk of an increase in soil acidity due to the clearing activity is considered low. It is recommended that Horizon Power refer to DWER acid sulfate soil guidelines to assist with the management of ground disturbing works (DWER, 2022b).

ASS are a standard consideration as part of any pre-mobilisation risk assessment (Horizon Power, 2022b), and a project specific management strategy will be developed to mitigate and manage any risk associated with ASS at the completion of the risk assessment, and prior to mobilisation (Horizon Power, 2022b). The applicant should refer to DWER's ASS guidelines for information to assist with the management of ground and/or groundwater disturbing works.

Aboriginal Heritage

A Native Title Determination encompasses the application area; Ngarluma/Yindjibarndi (WCD2005/001).

Several Aboriginal sites of significance have been mapped within the application area. It is the permit holder's responsibility to ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

The applicant has advised that they actively participated in the consultation process of the new *Aboriginal Cultural Heritage Act 2021* (ACH Act) and has undertaken a significant program of works to ensure its existing operational works and future projects are compliant with the new legislation. These works included the release of a corporate Aboriginal Cultural Heritage Policy in March 2023 (Horizon Power, 2023d). The applicant has advised that they understand their obligations under the ACH Act and seeks to make proactive and sustainable business decisions that positively impact Aboriginal and Torres Strait Islander individuals, communities, and businesses. Additional details on how they approach building respectful and sustainable relationships with Aboriginal and Torres Strait Islander stakeholders and organisations can be found in Horizon Power's Reconciliation Plan (Horizon Power, 2023d).

Within the draft CEMP the applicant has advised that they have commenced stakeholder engagement with the MAC regarding this project and the significant sites within the application area. Construction activities for the Project will only commence once stakeholder engagement has been completed and will comply with all aspects of the ACH Act as relevant to do so (Horizon Power, 2023d).

End

Appendix A. Additional information provided by applicant

Information	Description
Burrup Peninsula Interconnector Pipeline Flora and Fauna Survey (Astron, 2018)	<p>DDG Operations Pty Ltd commissioned Astron Environmental Services to undertake a biological survey of a proposed interconnector pipeline corridor, between the Woodside Energy Limited operated Karratha Gas Plant and Pluto Liquefied Natural Gas plants on the Burrup Peninsula. The applicant was approved by DDG Operations Pty Ltd to use this survey information as part of their application.</p> <p>The survey was conducted between 7 and 8 June 2018. This survey does not cover the application area, however, forms part of the regional context for flora species, vegetation types and condition and fauna species in the area.</p>
Burrup Expansion Project – Flora & Vegetation Survey (GHD, 2020)	<p>The applicant commissioned GHD Pty Ltd (GHD) to undertake a vegetation and flora survey within a section of the proposed transmission line. The survey was conducted between 23 to 28 April 2020 to delineate key flora and vegetation values and potential impact to areas of sensitivity (GHD, 2020). This survey area covers the south-eastern section of the application area (along with a greater area outside the application area). This survey also forms part of the regional context for flora species, vegetation types and condition in the area.</p>
Maitland to Karratha Terminal – Biological Flora and Fauna survey (GHD, 2022a)	<p>The applicant commissioned GHD to undertake a flora, vegetation and fauna survey of the Karratha to Maitland. The survey was conducted between 1 to 4 March 2022, however, did not cover the proposed project clearing footprint (Development Envelope). This survey, however, forms regional context for priority flora species and fauna species within close proximity to the application area.</p>
Technical Memorandum. Pluto Additional Areas (Flora and Fauna) Reconnaissance / Basic Survey (GHD, 2022b)	<p>The applicant commissioned GHD in response to the GHD 2020 survey, to expand vegetation mapping, vegetation condition mapping and fauna habitat mapping in previously unsurveyed areas of the application area. This survey was undertaken on 3 August 2022 and was intended to inform and facilitate the native vegetation clearing permit application.</p> <p>Since receiving the application and reviewing the GHD (2022b) survey, DWER sought additional information from the applicant and expert advice from the Department of Biodiversity, Conservation and Attractions (DBCA), to inform its assessment of environmental impacts to the PEC. This included the need for the applicant to conduct further survey work for a Priority Ecological Community (Priority 1 'Burrup Peninsula Rock Pile' Communities).</p> <p>The applicant later advised DWER that the GHD 2022(b) survey findings for flora species, vegetation type and condition be superseded by the Targeted PEC Survey (Horizon Power, 2023c). However, it should be noted that as the Targeted PEC survey did not undertake a fauna habitat assessment, the GHD 2022(b) survey should continue to be referred to for fauna habitat assessment purposes.</p> <p>Further information on the findings of this survey can be found detailed in section 3.2.1 and 3.2.2 above.</p>
Targeted PEC Survey, Horizon Power Corridor, Burrup Peninsula (VLA, 2023)	<p>The applicant commissioned Vicki Long & Associates (VLA, 2023) in response to DWER's notification to the applicant the diagnostic criteria applied by GHD (2022b) to identify the Priority 1 Ecological Community (PEC) 'Burrup Peninsula Rock Pile' was not considered sufficient by DBCA, and that clarification was required to identify if the PEC was present on site and the scale of impact to the PEC from the proposal. The survey was undertaken on 8 May 2023.</p> <p>Following completion of the Targeted PEC survey, it was identified that only one of the three rock piles within the clearing footprint meet the diagnostic criteria, mainly due to weed invasion. The only one rock pile present is located at the very edge of the clearing footprint. Additional discrepancies were identified between the GHD (2022b) report and the new survey, including vegetation type, vegetation condition and identification of</p>

Information	Description
	<p>additional Priority 3 <i>Terminalia supranitifolia</i>. <i>Vigna triodiophylla</i> was considered to be abundant on the site in keeping with the GHD (2022b) report.</p> <p>As above, the applicant later advised DWER that the GHD 2022(b) survey findings for flora species, vegetation type and condition be superseded by the Targeted PEC Survey (Horizon Power, 2023).</p> <p>Further information on the findings of this survey can be found detailed in section 3.2.1 above.</p>
Draft Construction Environmental Management Plan (Horizon Power, 2022b)	<p>The applicant provided DWER with a copy of the (draft) construction (environmental) management plan (CEMP), which was developed to include clearing constraints, flora, fauna, weed management, aboriginal heritage, waste and clearing minimisation strategies as a minimum.</p> <p>Further information on the draft CEMP can be found detailed in section 3.1 above.</p>
Obligations under the <i>Aboriginal Cultural Heritage Act 2021</i> (Horizon Power, 2023d)	<p>The applicant provided DWER with confirmation of how they are complying with their obligations under the ACH Act.</p> <p>Further information can be found detailed in section 3.3.</p>
Further Priority Ecological Community commitments and priority flora management actions (Horizon Power, 2023e)	<p>The applicant provided DWER with further PEC commitments and priority flora management actions, along with confirmation on vegetation condition from the consultant (VLA). The applicant advised of the highly constrained application area and how they are managing multiple design considerations in relation to the Project.</p>

Appendix B. Site characteristics

The information provided below describes the key characteristics of the area proposed to be cleared and is based on the best information available to DWER at the time of this assessment. This information was used to inform the assessment of the clearing against the Clearing Principles, contained in Appendix C.

B.1 Site characteristics

Characteristic	Details
Local context	<p>The proposed clearing area is within the Burrup Strategic Industrial Area, located in the Pilbara region, in the extensive land use zone of Western Australia (WA). The application area is approximately 1.05 kilometres in length and separated by Burrup Road. The application area is bounded to the south and south-east by the gas pipeline, and to the north by the Pluto Gas Plant.</p> <p>Aerial imagery indicates the local area (50-kilometre radius from the centre of the area proposed to be cleared) retains over 90 per cent of the original native vegetation cover.</p>
Ecological linkage	<p>No formal ecological linkages are mapped over the application area, or occur in the vicinity of the application area.</p>
Conservation areas	<p>There are no DBCA managed conservation areas located within, or immediately adjacent to application area.</p> <p>The closest reserves are an un-named reserve (arboretum) approximately four kilometres east of application area and the Murujuga National Park, located on the Burrup Peninsula more than 10 kilometres north of the application area.</p>
Vegetation description	<p>As per the Targeted PEC (Flora and Vegetation) (VLA, 2023) survey report, the vegetation within the proposed clearing area consists of six vegetation types:</p>

Characteristic	Details		
	Vegetation Units	Area (hectares)	Percentage (%)
	*AjSa*Cc - <i>Aerva javanica</i> low shrubland, with <i>Salsola australis</i> over <i>Cenchrus ciliaris</i> tussock grassland with patchy <i>Cymbopogon ambiguus</i>	3.27	36.13
	BaTsAcIc - <i>Brachychiton acuminatus</i> , <i>Terminalia supranitifolia</i> , <i>Acacia coriacea</i> , <i>Ipomea costata</i> with scattered <i>Triodia epactia</i> , <i>Cymbopogon ambiguus</i> / <i>Cenchrus ciliaris</i> tussocks.	0.33	3.62
	Ch+AtTe*Cc - <i>Corymbia hamersleyana</i> low woodland with scattered <i>Brachychiton acuminatus</i> , <i>Ehretia saligna</i> over + <i>Acacia trachycarpa</i> open shrubland over <i>Triodia epactia</i> and <i>Cenchrus ciliaris</i> grassland.	0.25	2.76
	GpAcTe - <i>Grevillea pyramidalis</i> , <i>Acacia coriacea</i> tall shrubland over <i>Acacia bivenosa</i> , <i>A. morrisonii</i> , <i>Hakea loreus subsp.loreus</i> open shrubland over <i>Triodia epactia</i> hummock grassland with patchy <i>Triodia angusta</i> and <i>Cenchrus ciliaris</i> .	1.21	13.35
	GplmTe - <i>Grevillea pyramidalis</i> tall open shrubland over <i>Indigofera monophylla</i> open low shrubland over <i>Triodia epactia</i> hummock grassland.	3.60	39.70
	TcTaTe - <i>Terminalia circumulata</i> low woodland over <i>Indigofera monophylla</i> low scattered shrubs over <i>Triodia angusta</i> and <i>Triodia epactia</i> hummock grassland.	0.07	0.74
	<p>*=weed species +=species introduced to Burrup but native elsewhere Additional weed species make up 0.34 hectares (3.71 per cent) of application area.</p> <p>Representative photographs and excerpts from the survey are available in Appendix E.</p> <p>The mapped vegetation type over the application area is:</p> <ul style="list-style-type: none"> • Beard, Abydos plain – Roebourne (117), which is described as hummock grasslands, grass steppe; soft spinifex (Shepherd et al, 2001). <p>The mapped vegetation types retain approximately 99 per cent of the original extent (Government of Western Australia, 2019).</p>		
Vegetation condition	<p>As per the Targeted PEC (Flora and Vegetation) (VLA, 2023) survey report, the vegetation condition within the proposed clearing area varied from Completely Degraded to Very Good (Trudgen, 1991) condition:</p> <ul style="list-style-type: none"> • Very good - some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks; • Good – more obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds; • Poor - still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds; • Very poor - Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species; to • Completely degraded - Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 		

Characteristic	Details
	<p>'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.</p> <p>The full Trudgen (1991) condition rating scale is provided in Appendix D.</p> <p>Representative photographs and excerpts from the surveys are available in Appendix E.</p>
Climate and landform	<p>The Pilbara region of WA experience a semi-arid climate. Temperatures are warm to hot all year and rainfall is generally low, occurring in the late summer months. The mean annual rainfall over the Pilbara region is 292.4 millimetres (GHD, 2022a).</p> <p>The Pilbara Province lies over the Pilbara Craton, which consists of two different tectonic components. The two broad geological sequences are the ancient Archaean granite-greenstone terrain and the younger volcano-sedimentary sequence of the Hamersley Basin (DPIRD, 2019).</p>
Soil description	<p>The application area is mapped within one soil landscape unit:</p> <ul style="list-style-type: none"> Granite System (286Gr), described as rugged granitic hills supporting shrubby hard and soft spinifex grasslands (DPIRD, 2019).
Land degradation risk	<p>Land degradation risk of the soil over the application area in regard to erosion is that surface water is largely reliant on weather and waterways generally only flow for parts of the year, in response to larger cyclonic or rainfall events. Water erosion may occur as sheetflow in broad inter-drainage areas on alluvial plains, near the baselines of hills and ridges with the risk of soil erosion during rainfall events (DPIRD, 2019).</p> <p>The City of Karratha Water Management Strategy (Essential Environment 2016) indicate that drainage issues arise from the high erosion tendencies of the red soils and the large volumes of stormwater that flow in the wet season.</p>
Waterbodies	<p>There are no internationally (Ramsar) or nationally important wetlands located within a 50-kilometre radius of the application area (DBCA-010).</p> <p>The application area is in proximity to the Indian Ocean, with the mapped WA coastline located approximately 1,000 metres to the west at its closest point in the north of the application area where mapped Saline Coastal Flats are located. This is within the Littoral Land System of coastal marshes, and mapped as the VT04 vegetation type of GHD (2020); <i>Tecticornia</i> low chenopod shrubland with scattered <i>Avicennia marina</i> on saline flats with tidal inundation.</p> <p>The desktop assessment and aerial imagery indicated that there are no watercourses (rivers) or wetlands within the application area.</p>
Hydrogeography	<p>The area proposed to be cleared is within the proclaimed Pilbara Groundwater and Surface water areas under the RiWI Act (DWER-034, DWER-037).</p> <p>The application area does not occur within a Public Drinking Water Source Area (DWER-034) or an area subject to the <i>Country Areas Water Supply Act 1947</i>.</p> <p>Groundwater salinity level (Total Dissolved Solids) is mapped as 1,000-3,000 milligrams per litre (fresh to brackish) (DWER-026).</p> <p>Groundwater level lies at approximately 12-13 metres below ground level (GHD, 2020).</p>
Flora	<p>Nineteen conservation significant flora species were recorded within the 50-kilometre radius local area. Nearest records are <i>Rhynchosia bungarensis</i> (Priority 4) and <i>Terminalia supranitifolia</i> (Priority 3) mapped 0.46 kilometres from the application area. The local area did not identify any threatened flora species.</p> <p>The flora analysis table B.3 below provides an analysis of the flora species identified within the local area during the desktop assessment.</p>

Characteristic	Details
	Three conservation significant flora taxa <i>Terminalia supranitifolia</i> (Priority 3), <i>Vigna triodiophila</i> (Priority 3), and <i>Rhynchosia bungarensis</i> (Priority 4) have been recorded within the application area during the Targeted PEC (flora and vegetation) survey (VLA, 2023).
Ecological communities	<p>While there is no mapped Threatened Ecological Communities (TEC) over the application area, the Targeted PEC survey (VLA, 2023) found a small section of Priority 1 Burrup Peninsula Rock Pile Communities PEC within the application area.</p> <p>Additionally, the desktop assessment identified 116 records of TEC's and PEC's within the 50-kilometre radius local area.</p>
Fauna	<p>The desktop assessment identified 60 conservation significant fauna species within a 50-kilometre radius of the application area, including 16 threatened species, 33 species protected under international agreements, two other specially protected species and nine priority species. The conservation significant fauna species include 42 birds, 11 mammals and seven reptiles.</p> <p>The closest fauna record is the endangered Pilbara olive python (<i>Liasis olivaceus barroni</i>) identified 0.15 kilometres from the application area. The fauna table B.4. below provides an analysis of the fauna species identified within the local area.</p> <p>No records of conservation significant fauna species were identified during the fauna survey (GHD, 2022b).</p>

B.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Pilbara	17,808,657.04	17,731,764.88	99.57	1,801,714.98	10.12
Vegetation complex					
117 (Hummock grassland)	897,108	883,705	98.51	125,405	13.98

*Government of Western Australia (2019)

B.3. Flora analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1), the distribution and extent of existing records, and biological survey information (Astron, 2018; GHD 2020 and VLA,2023), impacts to the following conservation significant flora required further consideration.

Species name	Conservation status	Suitable habitat features? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Did surveys identify? [Y, N, N/A]
<i>Eragrostis surreyana</i>	P3	Y	8.22	3	N
<i>Rhynchosia bungarensis</i>	P4	Y	0.46	33	Y
<i>Terminalia supranitifolia</i>	P3	Y	2.04	36	Y
<i>Vigna triodiophila</i>	P3	Y	0.83	11	Y

B.4 Fauna analysis table

With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1), the distribution and extent of existing records, and biological survey information (GHD 2022b), impacts to the following six conservation significant fauna species required further consideration.

Species scientific name	Species common name	Conservation status	Suitable habitat features? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Year of the most recent record	Did surveys identify? [Y, N, N/A]
BIRDS							
<i>Falco peregrinus</i>	Peregrine falcon	OS	Y	3.30	7	2011	Y - visitor

MAMMALS							
<i>Dasyurus hallucatus</i>	Northern quoll	EN	Y	1.34	357	2018	Y - visitor
<i>Leggadina lakedownensis</i>	northern short-tailed mouse, Lakeland Downs mouse, kerakenga	P4	Y	16.94	16	2011	N
<i>Pseudomys chapmani</i>	western pebble-mound mouse, ngadji	P4	Y	1.34	17	2015	N

REPTILES							
<i>Liasis olivaceus barroni</i>	Pilbara olive python	VU	Y	0.15	28	2019	Y - visitor
<i>Notoscincus butleri</i>	Lined soil-crevice skink (Dampier)	P4	Y	15.26	52	2015	N

B.5. Ecological community analysis table

With consideration for the site characteristics set out above, relevant datasets (Appendix F.2), the distribution and extent of existing records, and biological survey information (VLA, 2023), the following conservation significant ecological communities may be impacted by the clearing.

Community name	Conservation status	Distance of closest record to application area (km)	Did surveys identify? [Y, N, N/A]
Burrup Peninsula Rock Pile	P1	Within	Y

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

Appendix C. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
<p><u>Principle (a):</u> <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u></p> <p>According to the Targeted PEC survey (VLA, 2023), the application area contains six vegetation types and three conservation significant flora species. Additionally, the PEC survey (VLA, 2023) found a small section of Priority 1 ‘Burrup Peninsula Rock Pile Communities’ PEC within the application area. The vegetation within the application area ranges from a completely degraded to very good (Trudgen, 1991) condition (VLA, 2023).</p>	May be at variance	Yes <i>Refer to Section 3.2.1, above.</i>
<p><u>Principle (b):</u> <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna.”</i></p> <p><u>Assessment:</u></p> <p>One fauna habitat was identified within the application area (Rocky Hills with exposed boulder piles) (GHD, 2022b). According to the GHD (2022b) survey, no conservation significant fauna were recorded within the application area.</p> <p>Notwithstanding the above, based on a likelihood analysis, six conservation significant fauna species may utilise the application area, however, are not solely reliant on the habitat present in the application area (GHD, 2022b).</p>	Not likely to be at variance	Yes <i>Refer to Section 3.2.2, above.</i>
<p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u></p> <p>The area proposed to be cleared is unlikely to contain habitat for threatened flora species listed under the BC Act. No threatened flora species were identified from the local area and the flora and vegetation surveys did not identify any threatened flora species within the application area (GHD, 2020, GHD, 2022b, VLA, 2023).</p>	Not likely to be at variance	No
<p><u>Principle (d):</u> <i>“Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.”</i></p> <p><u>Assessment:</u></p> <p>No Threatened Ecological Communities (TEC) have been mapped within 50 kilometres of the application area. No vegetation types identified within the application area are representative of any TECs.</p>	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		
<p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The national objectives and targets for biodiversity conservation in Australia has a target to prevent the clearance of ecological communities</p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
<p>with an extent below 30 per cent of that present prior to the year 1750, below which species loss appears to accelerate exponentially at an ecosystem level (Commonwealth of Australia, 2001). The vegetation association (117) identified within the application area exceed the 30 per cent threshold, with the vegetation association retaining over 99 per cent of its original vegetation cover (See Appendix B.2). Over 90 percent of the original native vegetation has been retained within 50 kilometres of the application area.</p>		
<p><u>Principle (h):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of conservation areas mapped within the local area.</p>	Not likely to be at variance	No
Environmental value: land and water resources		
<p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u></p> <p>There are no permanent wetland or watercourse features within the application area. Given the tail-end of only one minor non-perennial drainage line slightly intersects the application area, the proposed clearing is unlikely to impact on or off-site hydrology and water quality. Additionally, GHD (2022b) noted that there was no riparian vegetation recorded within the application area.</p>	Not likely to be at variance	Yes <i>Refer to section 3.2.3 above</i>
<p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>Land degradation risks for water erosion and salinity are generally rated at low over the application area. However, the mapped soils may be susceptible to wind erosion when vegetation cover is removed. Dust can also be dispersed and deposited to nearby vegetation. The impact, however, is localised and temporary.</p> <p>Noting the extent and the linear nature of the of the application area, the proposed clearing is not likely to have an appreciable impact on land degradation.</p>	Not likely to be at variance	Yes <i>Refer to section 3.2.4 above</i>
<p><u>Principle (i):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.”</i></p> <p><u>Assessment:</u></p> <p>Given no major watercourses, wetlands and Public Drinking Water Sources Areas are recorded within the application area, the proposed clearing is unlikely to impact surface or groundwater quality.</p>	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
<p><u>Principle (j)</u>: “Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</p> <p><u>Assessment</u>:</p> <p>Surface water is largely reliant on weather and surface water in waterways is generally only present or flowing for parts of the year, in response to larger cyclonic or rainfall events. The application area is not located within an area subject to flooding or inundation.</p> <p>Noting the extent and the linear nature of the proposed clearing along with the standard erosion management employed by Horizon Power, the proposed clearing of native vegetation is not likely to cause or exacerbate, the incidence or intensity of flooding.</p>	Not likely to be at variance	No

Appendix D. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation's ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from adapted from Trudgen, M.E. (1991) *Vegetation condition scale* in National Trust (WA) 1993 Urban Bushland Policy. National Trust of Australia (WA), Wildflower Society of WA (Inc.), and the Tree Society (Inc.), Perth.

Measuring vegetation condition for the Eremaean and Northern Botanical Provinces (Trudgen, 1991)

Condition	Description
Excellent	Pristine or nearly so, no obvious signs of damage caused by human activities since European settlement.
Very good	Some relatively slight signs of damage caused by human activities since European settlement. For example, some signs of damage to tree trunks caused by repeated fire, the presence of some relatively non-aggressive weeds, or occasional vehicle tracks.
Good	More obvious signs of damage caused by human activity since European settlement, including some obvious impact on the vegetation structure such as that caused by low levels of grazing or slightly aggressive weeds.
Poor	Still retains basic vegetation structure or ability to regenerate it after very obvious impacts of human activities since European settlement, such as grazing, partial clearing, frequent fires or aggressive weeds.
Very poor	Severely impacted by grazing, very frequent fires, clearing or a combination of these activities. Scope for some regeneration but not to a state approaching good condition without intensive management. Usually with a number of weed species present including very aggressive species.
Completely degraded	Areas that are completely or almost completely without native species in the structure of their vegetation; i.e. areas that are cleared or 'parkland cleared' with their flora comprising weed or crop species with isolated native trees or shrubs.



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Appendix E. Biological survey excerpts / representative site photographs

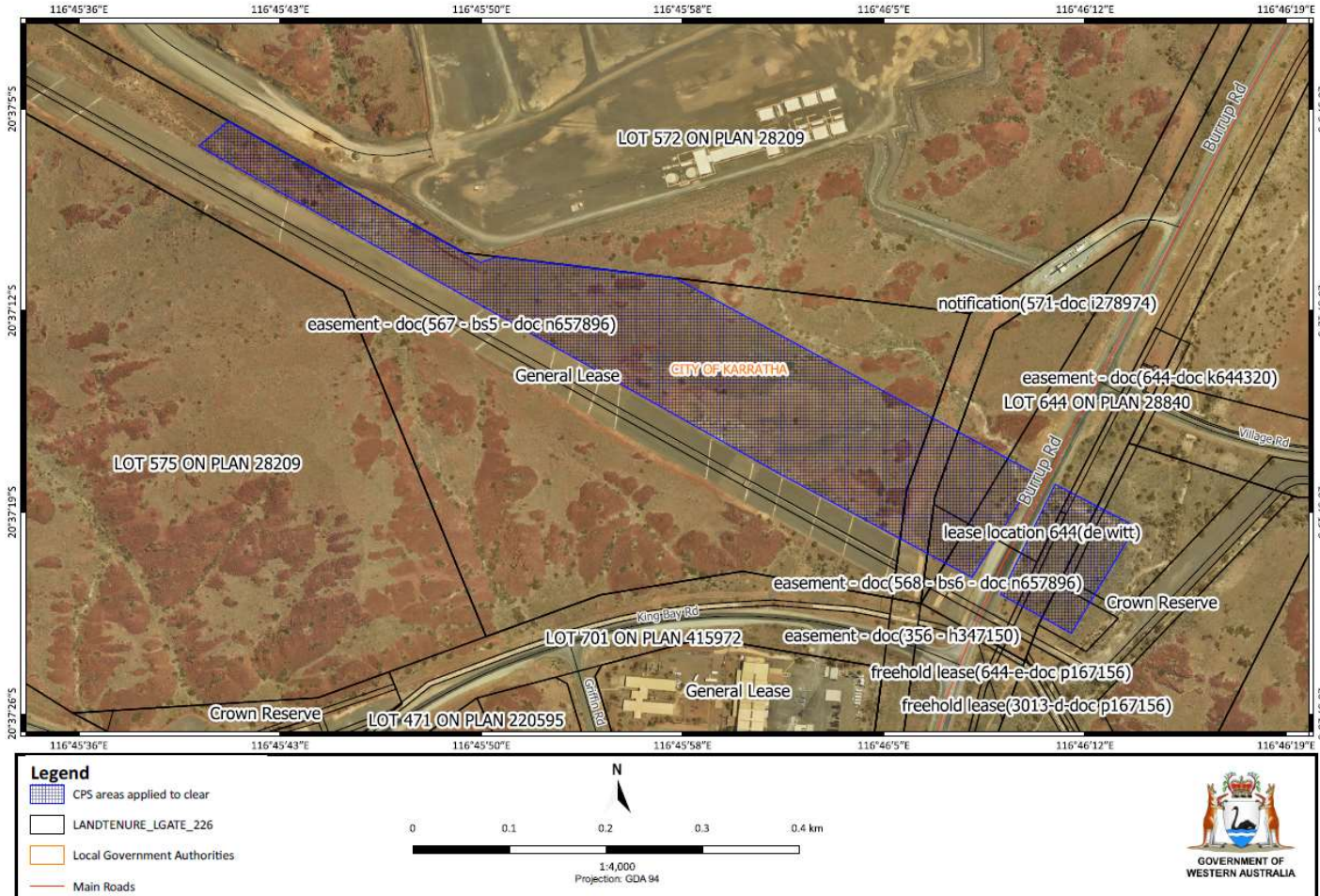


Figure 2 – Original Clearing Footprint (Development Envelope) of 9.64 hectares (Horizon Power, 2022a)



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3.3.1. Targeted PEC (Flora and vegetation) Survey excerpts (VLA, 2023)

Vegetation

Six distinct vegetation types were identified, one of which is a weed dominated vegetation type and accounts for one-third of the survey area. Describing the vegetation was not a part of this scope, but the actual vegetation present was at such a significant variance to that reported in GHD (2022) that the author could not but correct this. The six vegetation types were described based on strata and dominance of the key species in each. The vegetation described is presented in Table 1 below along with their Condition based on Trudgen 1988 as approved by EPA 2016. Vegetation types are shown in Figure 1 and Condition in Figure 2.

Table 1: Vegetation Types Recorded by VLA 2023 on survey area.

Code	Description	Condition (EPA 2016)	Comment
GpAcTe	<i>Grevillea pyramidalis</i> , <i>Acacia coriacea</i> tall shrubland over <i>Acacia bivenosa</i> , <i>A. morrisonii</i> , <i>Hakea loreus</i> subsp <i>loreus</i> open shrubland over <i>Triodia epactia</i> hummock grassland with patchy <i>Triodia angusta</i> and <i>*Cenchrus ciliaris</i> .	Good	This occurred on the eastern portion of the survey area, east of Burrup road. This stony areas tapers into a broad creekline. The weed <i>*Cenchrus ciliaris</i> (buffel grass) is patchy, but is dense along the immediate road verge. Not PEC vegetation.
*AjSa*Cc	<i>*Aerva javancia</i> low shrubland, with <i>Salsola australis</i> over <i>*Cenchrus ciliaris</i> tussock grassland with patchy <i>Cymbopogon ambiguus</i> .	Very Poor	This area occurs adjacent and north of the service corridor and occupied approximately 30% of the entire survey area. The area has been significantly disturbed in the past. Not PEC vegetation
TcTaTe	<i>Terminalia circumulata</i> low woodland over <i>Indigofera monophylla</i> low scattered shrubs over <i>Triodia angusta</i> and <i>Triodia epactia</i> hummock grassland.	Very Good	This vegetation of low woodland occurs in a creek line that intercepts a small area on the northern boundary of the survey area. It should not be disturbed. Not PEC vegetation

Code	Description	Condition (EPA 2016)	Comment
GpImTe	<i>Grevillea pyramidalis</i> tall open shrubland over <i>Indigofera monophylla</i> open low shrubland over <i>Triodia epactia</i> hummock grassland.	Very Good	Occurs over about 30% of the survey area on high rocky hill slopes. Not PEC vegetation
Ch+ATeCc	<i>Corymbia hamersleyana</i> low woodland with scattered <i>Brachychiton acuminatus</i> , <i>Ehretia saligna</i> over + <i>Acacia trachycarpa</i> open shrubland over <i>Triodia epactia</i> and <i>*Cenchrus ciliaris</i> grassland.	Good	This occurs immediately adjacent and on the west side of Burrup Road. Not PEC vegetation
BaTsAcIc	<i>Brachychiton acuminatus</i> , <i>Terminalia supranitifolia</i> , <i>Acacia coriacea</i> , <i>Ipomoea costata</i> with scattered <i>Triodia epactia</i> , <i>Cymbopogon ambiguus</i> , / <i>*Cenchrus ciliaris</i> tussocks.	Very Good	PEC vegetation. However all but one of these has been degraded with buffel grass (<i>*Cenchrus ciliaris</i>) and therefore no longer a PEC.

*= weed species

+ = species introduced to Burrup but native elsewhere

Figure 3 – Vegetation types and descriptions recorded within the application area (VLA, 2023)

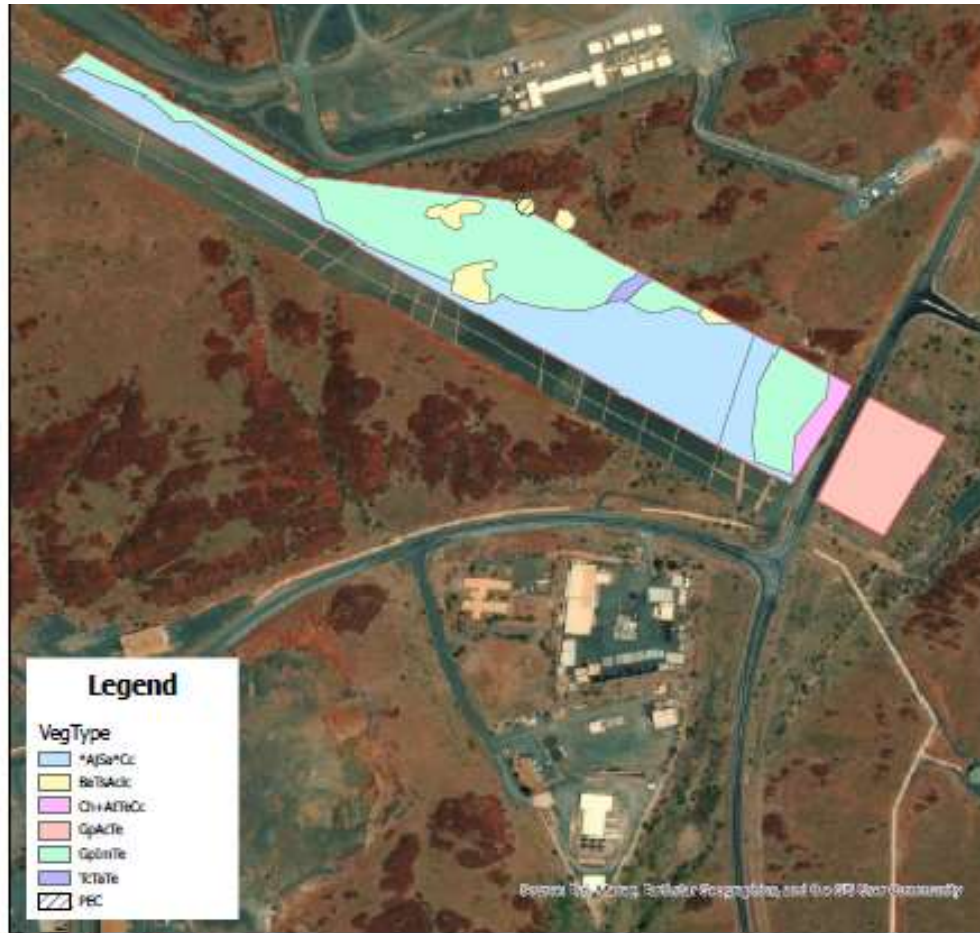


Figure 1 | Vegetation Type

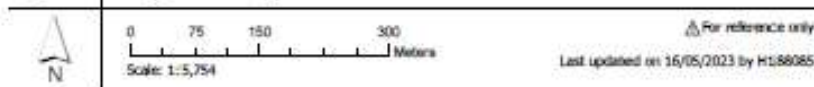


Figure 4 – Vegetation types recorded within the survey area (VLA, 2023)

Vegetation Condition

The GHD report indicates the Vegetation Condition over the entire survey area was in Very Good condition based on EPA 2016. The vegetation condition recorded by VLA, based on EPA 2016, was variable from Poor to Very Good based on EPA 2016.

Vegetation over the previously disturbed areas was dominated by weed species buffel grass and kapok and to represent this weed dominated vegetation as "Very Good" is inaccurate. The area has been previously disturbed and the vegetation has less than 5% native species cover (and that was dominated by one species, *Cymbopogon ambiguus*).

It should be noted that *+Acacia trachycarpa* was recorded in the drainage line adjacent Burrup Road in vegetation type Ch+AtTe*Cc. The "+" indicates this species is not native to the Burrup Peninsula but is a native of drainage lines further inland. It was originally planted in landscaping around the Woodside Supply Base and the Woodside Village (Village Road) in the 1990s and has escaped those locations. It is therefore rated the same as a weed species for the Burrup Peninsula.

The remainder of the vegetation is in Good to Very Good condition. This is indicated on Figure 2.

Figure 5 – Vegetation conditions* recorded within the survey area (VLA, 2023)

(NB: *Horizon Power 2023e, advised that the text should have read "was variable from Completely Degraded to Very Good", not Poor to Very Good as indicated above).

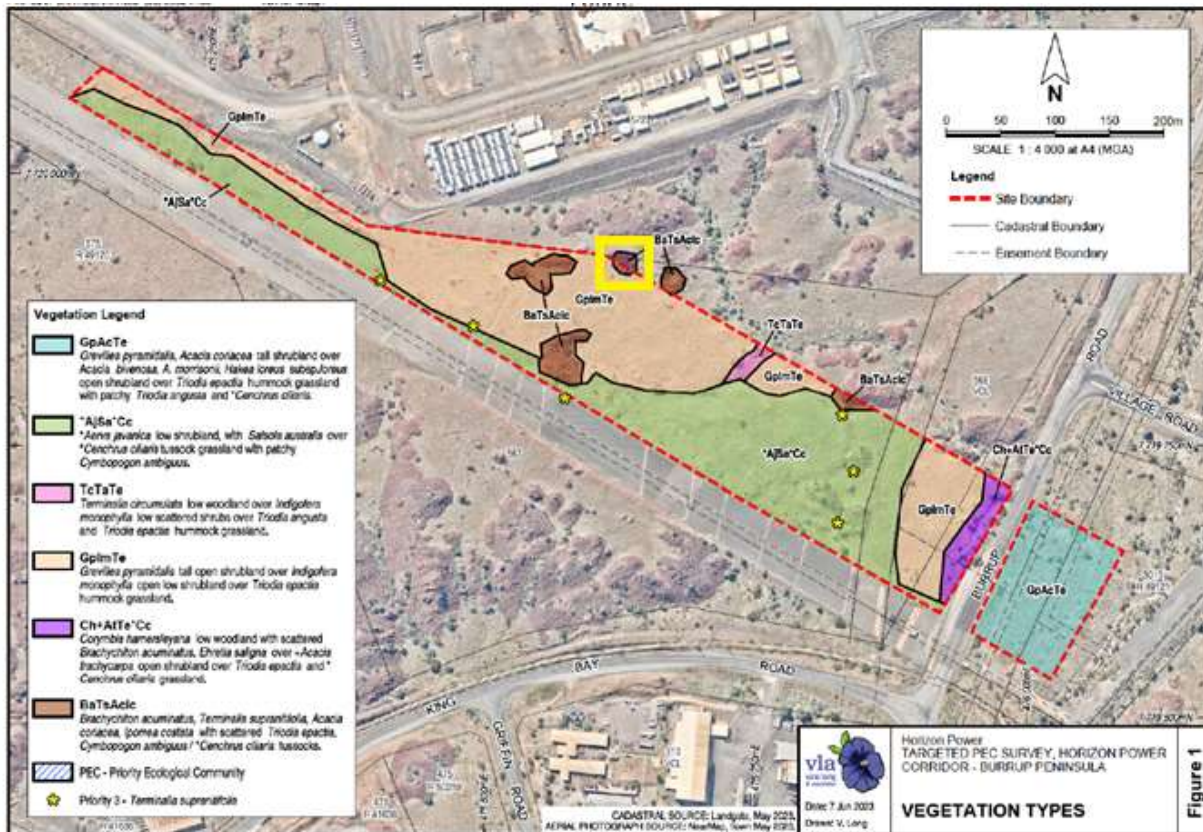


Figure 7 – PEC (Priority Ecological Community) (highlighted) located within the application area (VLA, 2023)



Plates 1 & 2 : Degraded area, previously disturbed and now supports 90% mixed *Cenchrus ciliaris* (buffel grass), *Aerva javanica* (kapok) with colonising *Salsola australis* (tumble weed). (Vegetation **AjSa*Cc*)

Figure 8 – Plates 1 and 2 – Vegetation type **AjSa*Cc* (VLA, 2023)



Plate 3: Showing distinct boundary between native undisturbed vegetation type **GplmTe** (foreground) and previously cleared area with ***AjSa*Cc** vegetation (background),



Plate 4: Small rockpile PEC with *Brachychiton acuminatus*, *Terminalia supranitifolia*, *Acacia coriacea*, *Ipomoea costata*, scattered *Triodia epactia*. (Vegetation Type: **BaTsAcIc**)

Figure 9 – Plates 3 and 4 – Vegetation types *AjSa*Cc and BaTsAcIc (VLA, 2023)



Plate 5: Vegetation Type **GpAcTe**



Plate 6 : Vegetation Type **TcTaTe**

Figure 10 – Plates 5 and 6 – Vegetation types GpAcTe and TcTaTe (VLA, 2023)



Plate 7 Vegetation Type Ch+AtTe*Cc



Plate 8: PEC vegetation near existing pipeline corridor; no longer a PEC because degraded by buffel grass.

Figure 11 – Plates 7 and 8 – Vegetation types Ch+AtTe*Cc and no longer a PEC (VLA, 2023)

3.3.2. GHD (2020) Burrup Expansion Project – Flora & Vegetation Survey



Figure 12 – Representative photograph of *Rhynchosia bungarensis* (GHD, 2020)



Figure 13 – Representative photograph of *Terminalia supranitifolia* (GHD, 2020)



Figure 14 – Representative photographs of *Vigna triodiophila* (GHD, 2020)

3.3.3. Further information provided by Horizon Power

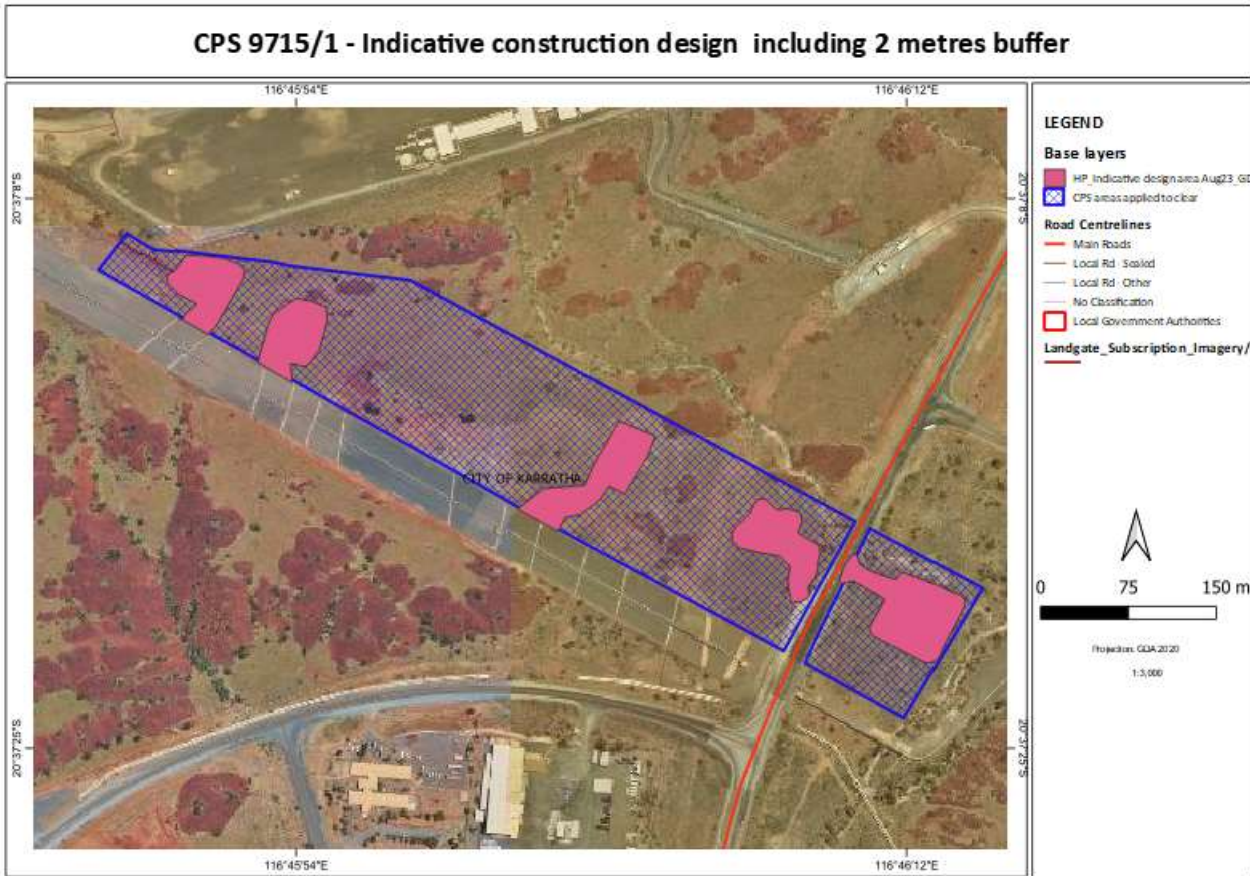


Figure 14 – Horizon Power’s indicative construction design (Horizon Power, 2023e)

Appendix F. Sources of information

F.1 GIS databases

Publicly available GIS Databases used (sourced from www.data.wa.gov.au):

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems

Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- Threatened Flora (TPFL)
- Threatened Flora (WAHerb)
- Threatened Fauna
- Threatened Ecological Communities and Priority Ecological Communities
- Threatened Ecological Communities and Priority Ecological Communities (Buffers)

F.2. References

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