

**Appendix B Targeted Flora Survey 2022 – Strategen-JBS&G 2022b – Beharra Springs
Deep 2 Targeted Flora Survey Spring 2022**



Beach Energy
Targeted Flora Searches, Beharra Springs 2, Beharra
Springs 2 Deep and Associated Access Tracks
Mount Adams Road, Arrowsmith

13 December 2022
62676/149,050 (Rev 0)
JBS&G

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Appendix A Definitions and Classifications

Appendix B Likelihood of Occurrence Assessment

Abbreviations

Term	Definition
BC Act	<i>Western Australian Biodiversity Conservation Act 2016</i>
BoM	Bureau of Meteorology
DBCA	Western Australian Department of Biodiversity, Conservations and Attractions
DCCEEW	Commonwealth Department of Climate Change, Energy, the Environment and Water
DEWHA	Commonwealth Department of Environment, Water, Heritage and the Arts (2007 – 2010)
DPIRD	Western Australian Department of Primary Industries and Regional Development
EN	Endangered (conservation status as listed under the Commonwealth EPBC Act and/or State BC Act)
EP Act	Western Australian Environmental Protection Act 1986
EPA	Western Australian Environmental Protection Authority
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
IBRA	Interim Biogeographic Regionalisation for Australia
km	kilometre/kilometres
m	metre/metres
MNES	Matters of National Environmental Significance
P1, P2, P3, P4, P5	Priority Flora ranking (P1-P5) as per DBCA listings
PMST	Protected Matters Search Tool (hosted by DCCEEW, used to identify MNES)
sp.	Species (generally referring to an unidentified taxon or when a phrase name has been applied)
var.	Variety (infrataxon)
VU	Vulnerable (conservation status as listed under the Commonwealth EPBC Act and/or State BC Act)
WAH	Western Australian Herbarium

1. Background

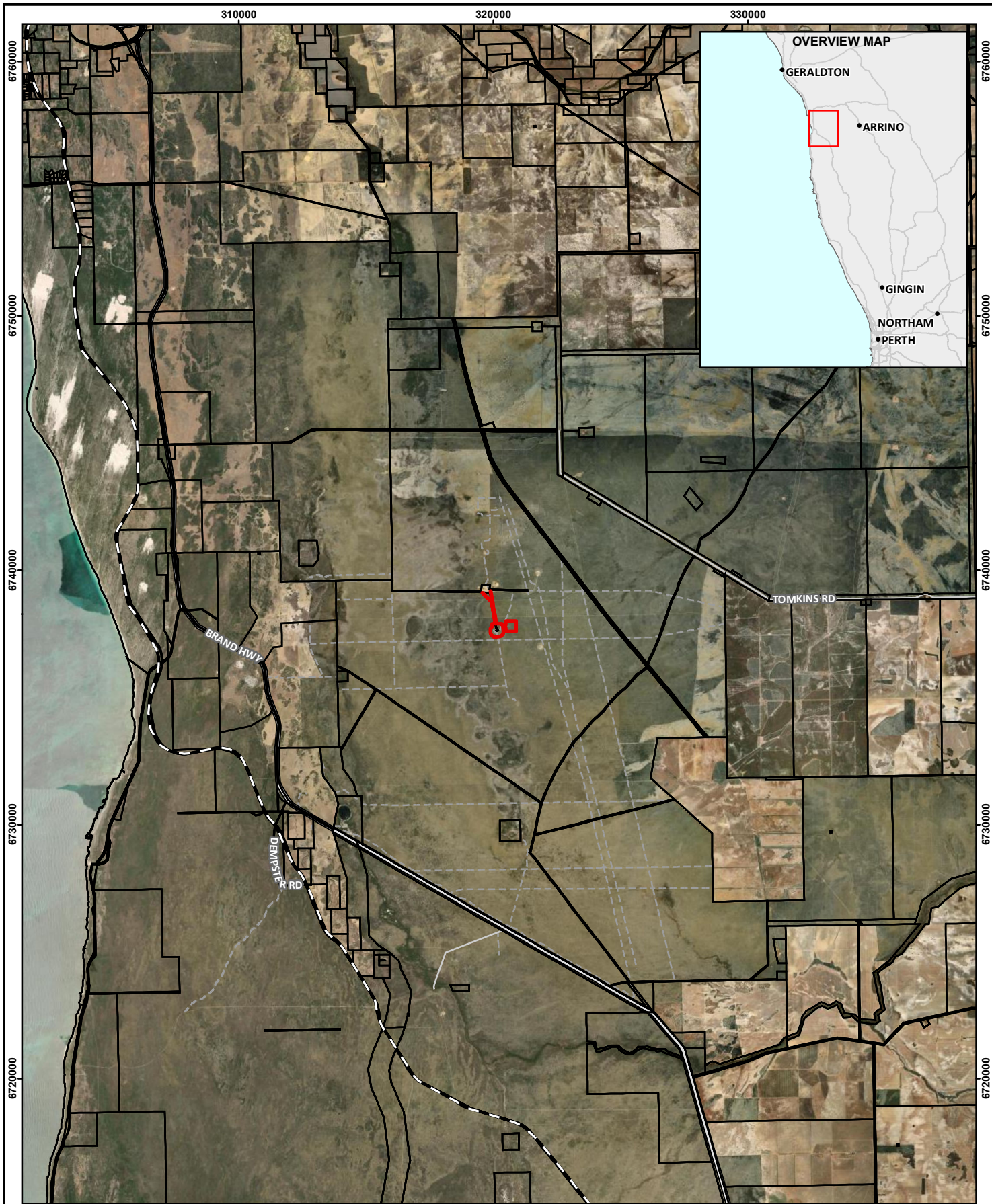
1.1 Scope

Beach Energy Resources (Perth Basin) Pty Ltd (Beach Energy) is the part owner and operator of the Beharra Springs Gas Facility. Project infrastructure is contained within Production Licences L11 and L22, Exploration Permit EP320 and Pipeline Licence PL18. Beach Energy are proposing to develop infrastructure and assets associated with the production of natural gas within their Beharra Springs Project at Beharra Springs 2, Beharra Springs 2 Deep and associated access tracks (Survey Area).

The Survey Area was subject to a Reconnaissance flora and vegetation survey conducted by ecologists from JBS&G in May and June, 2022. The Reconnaissance survey was conducted to broadly define ecological values associated with flora and vegetation within and adjacent to the Survey Area. Based on the findings during the Reconnaissance survey, it was determined that targeted searches were appropriate due to the high probability of flora of conservation value being present. Beach Energy engaged JBS&G to conduct these searches during spring of 2022.

1.2 Survey Area

The Survey Area was located in Arrowsmith, approximately 30 km southeast of Dongara, Western Australia in the Shire of Irwin. The Survey Area contained a footprint for two proposed well pads and an access track and covered an area of 44.72 ha (Figure 1.1).



Legend Survey Area Cadastral boundary Rail line Highways Minor road Track	Scale 1:200,000 at A4		Perth Basin Ecological Studies Targeted Flora Survey Beharra Springs 2 and Beharra Springs 2 Deep SURVEY AREA LOCATION
	Coord. Sys. GDA2020 MGA Zone 50		
	Job No: 62676		FIGURE 1.1
	Client: Beach Energy Limited		
	Version: A	Date: 09-Dec-2022	
	Drawn By: jcrute	Checked By: CT	

1.3 Legislative Context

Flora in Western Australia (WA) are protected formally and informally by various legislative and non-legislative measures, including:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) – Commonwealth.
- *Biodiversity Conservation Act 2016* (BC Act) – State.
- *Environmental Protection Act 1986* (EP Act) – State; and
- WA Department of Biodiversity, Conservation and Attractions (DBCA) Priority lists for flora.

A short contextual description of each legislative measure is provided below. Other definitions, including species conservation categories, are provided in **Appendix A**.

1.3.1 Environment Protection and Biodiversity Conservation Act 1999

On lands that are not vested in the Federal Government, the EPBC Act aims to protect Matters of National Environmental Significance (MNES), which are detailed in Appendix A. Under the EPBC Act, the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) lists protected species by criteria set out in the Act. Species are conservation significant if they are listed as Threatened (i.e., Critically Endangered, Endangered and Vulnerable), Migratory (as relates to international agreements) or Marine (when within Commonwealth waters jurisdiction).

1.3.2 Biodiversity Conservation Act 2016

DBCA lists taxa under the provisions of the BC Act as protected and are classified as according to their need for protection (see Appendix A). The BC Act makes it an offence to ‘take’ Threatened species without an appropriate licence. There are financial penalties for contravening the BC Act. Under the BC Act, DBCA lists species as Threatened (T) (Declared Rare) or Priority Flora (P1, P2, P3 or P4).

1.3.3 Environmental Protection Act 1986

Threatened flora are given special consideration in environmental impact assessments and have special status as Environmentally Sensitive Areas (ESAs) under the EP Act and the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*. Exemptions for a clearing permit do not apply in, or within 50 m of, an ESA.

1.3.4 Relevant Guidelines

Additionally, the following factors, guidelines and government listings were taken into consideration when conducting ecological studies within the Survey Area:

- Department of Environment, Water, Heritage and the Arts (DEWHA) (2009) *Matters of National Environmental Significance. Significant impact guidelines 1.1 – Environment Protection and Biodiversity Conservation Act 1999*.
- EPA (2020) *Statement of Environmental Principles, Factors and Objectives*.
- EPA (2016a) *Environmental Factor Guideline – Flora and Vegetation*.
- EPA (2016b) *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment*, referred to hereafter as the Flora and Vegetation Technical Guidance; and
- Locally significant populations recognised by the DBCA.

2. Methods

2.1 Desktop Review

A desktop review was conducted in accordance with current EPA guidance (EPA 2016b; 2020). The desktop review incorporated information on climate, biogeography, the results of a DBCA Threatened (Declared Rare) and Priority Flora database search and an EPBC Act Protected Matters Database search. In addition to this, relevant information from a Reconnaissance survey conducted by JBS&G (2022) was reviewed to provide information on vegetation within the Survey Area.

2.2 Targeted Flora Searches

2.2.1 Survey Methods

Targeted flora searches within the Beharra Springs 2, Beharra Springs 2 Deep and associated access track areas were conducted between 3rd – 16th November 2022. The searches were undertaken by the following JBS&G personnel:

- Terri Jones (Associate Ecologist, FB62000191).
- Brett Neasham (Senior Ecologist, FB62000483).
- Hannah Dlugi (Ecologist, FB62000448); and
- Logan Penman (Project Scientist).

The Survey Area was searched along parallel traverses spaced at approximately 10 m intervals. Where Priority flora were observed, the following was recorded in Fulcrum© (Spatial Networks, Inc.) on Samsung Tab A Tablets:

- Field name and sample collection number.
- Number of individuals present.
- Brief description of vegetation; and
- Notes in relation to the individual plants (condition, evidence of disturbances etc.).

When Threatened Flora were observed, the following additional information was recorded:

- Location of the individuals, recorded on a Garmin eTrex© GPS device; and
- Photographic record.

2.2.2 Flora Identification and Nomenclature

Where flora could not be identified confidently in the field, specimens were collected in accordance with procedures outlined by the Western Australian Herbarium (WAH) (DBCA 2020a). Plant specimens collected during the field surveys were identified by experienced independent taxonomist Bethea Loudon or Mike Hislop from the WAH. Nomenclature of species recorded was undertaken in accordance with WAH (1998-2022).

3. Desktop Assessment

3.1 Regional Context

3.1.1 Lesueur Bioregion

The Survey Area was located in the Lesueur Sandplain (GES02) subregion of the Geraldton Sandplains (GES) IBRA 7 bioregion (DAWE 2020). The Lesueur Sandplain is described as consisting of “coastal Aeolian and limestones, Jurassic siltstones and sandstones of Central Perth Basin” (Desmond and Chant 2002; pg. 293). Land use in the subregion is predominately dry-land agriculture (~69 %), with the balance in either conservation or UCL/Crown reserves (Desmond and Chant 2002). The Lesueur Sandplains subregion has a National Reserve System Protection Level of 15.01 – 30 % (DAWE 2020).

Flora endemism is high in the region, with over 250 sandplain species endemic to the region (Desmond and Chant 2001). Within this, there are a high number of Threatened and Priority flora and smaller number of fauna species at risk (Desmond and Chant 2002). Natural Resource Management is highly variable, with a number of species and ecosystems in need of detailed recovery and protection plans and improvements required for preservation of vegetation in and out of the reserve system (Desmond and Chant 2002).

The vegetation in the subregion is largely endemic rich proteaceous scrub-heaths with areas of York Gum and Jam woodlands on outwash plains (Desmond & Chant 2002). There are 10 ecosystems with over 85 % of their total extent within the Lesueur subregion. In addition to this, there are two rare communities – Lesueur floristic communities and stygofauna of cave communities in the Beekeepers Nature Reserve Area – located in the subregion (Desmond and Chant 2002).

3.1.2 Climate

The region has a dry warm Mediterranean climate with warm, dry summers and cool, wet winters (Beard 1990). Annual precipitation for the region is between 300 – 500 mm, the majority of which is concentrated in 4-5 months (Beard 1990). Recent rainfall data for the twelve months preceding the survey was reviewed for Green Grove (Station 008057), which is located 6.7 km away from the Beharra Springs Project (BoM 2022). In the three months prior to the site visit, above average rainfall was recorded at Green Grove (Station 008057) (Figure 3.1). Temperature data was reviewed for the now inactive Eneabba site (Station 008025) (BoM 2022). Highest average maxima of 36.4 °C and 36.5 °C were observed in January and February while lowest average maximum of 19.7 °C was recorded in June, with similar patterns for average minima.

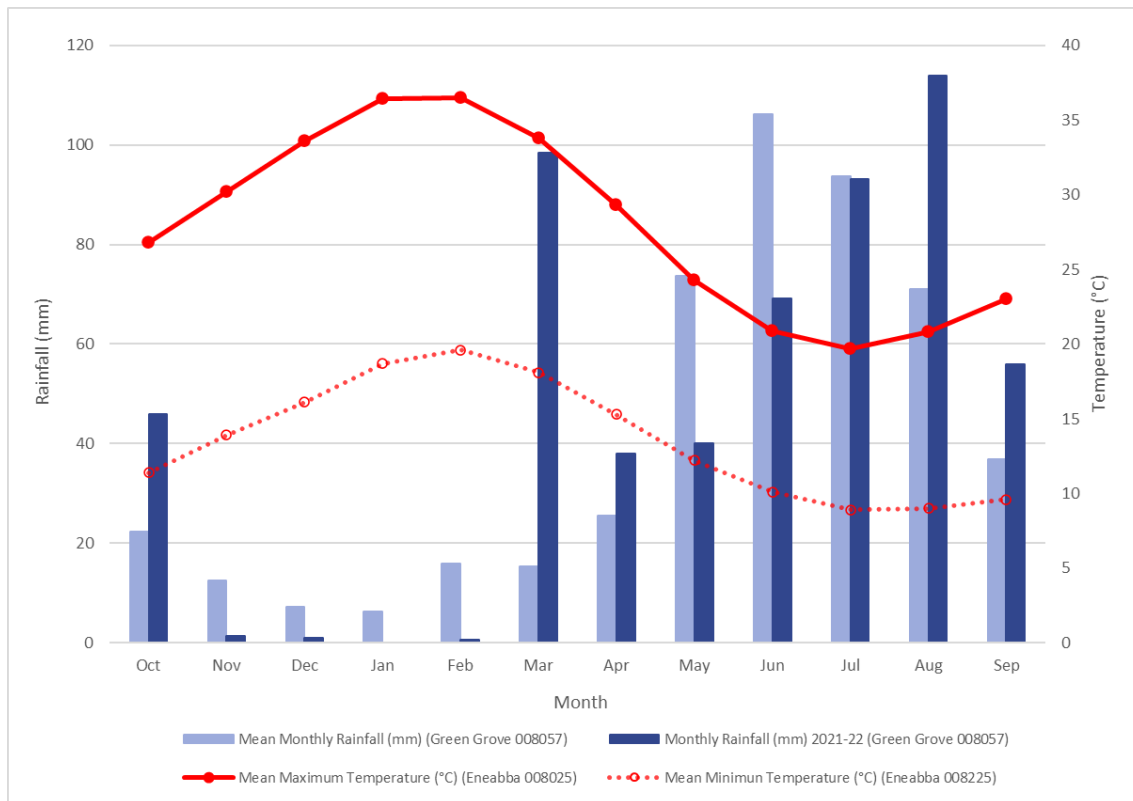


Figure 3.1: Local rainfall data and longer-term temperature data for Bureau of Meteorology stations close to the Survey Area.

3.1.3 Soils and Landforms

The Geraldton Sandplains are characterised by a series of old dunes which run parallel to the coast. The younger Quindalup dunes occur near the contemporary coastline, with the Spearwood dunes occurring further inland. The soils are typically sandy with some areas of exposed limestone, and a series of wetlands occurs along the plains. In the east lateritic rises occur.

Based on the 2017 soil and landform mapping dataset DPIRD-027 from the Department of Primary Industries and Regional Development (DPIRD 2017), the entire Survey Area was located on the Beharra 4 subsystem, which is characterised as level to gently undulating sandplain with numerous small playas and swampy depressions and yellow and pale deep sands with some swamp soils. The soil-land sub-systems have been used to inform potential presence of conservation significant flora and communities.

3.1.4 Pre-European Vegetation

Shephard *et al.* (2002) mapped the extent of pre-European vegetation across Western Australia, with recent updates reflecting the National Vegetation Information System (NVIS) Standards. One vegetation association corresponds with the Survey Area: Eridoon_378. The pre-European and current extent of this vegetation association is available from the DBCA Statewide Vegetation Statistics Dataset (DBCA 2019) and is provided in Table 3.1.

Table 3.1: Vegetation Associations

System	Association	Pre-European extent within IBRA region (ha)	Percent remaining within IBRA region (%)
Eridoon	378 – Scrub-Heath. Mixed heath with scattered tall Acacia spp., PROTEACEAE and MYRTACEAE.	93,523.98	65.04

3.1.5 Perth Basin Ecological Studies Interim Report (JBS&G, 2022)

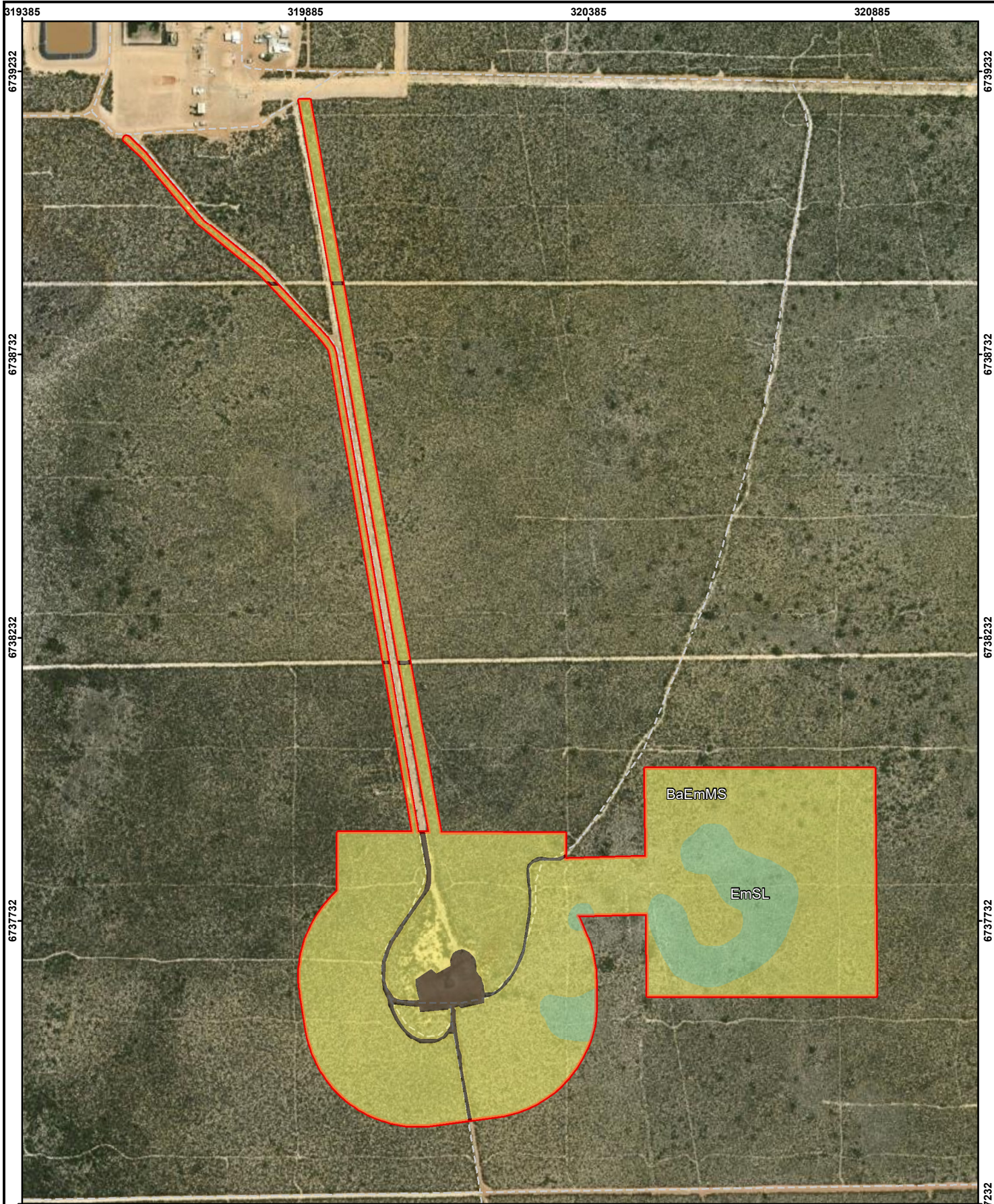
Vegetation in the Survey Area was mapped by JBS&G during the Reconnaissance survey conducted in May and June 2022. Two vegetation types were defined and delineated in the area:

- **BaEmMS** – Open mid shrubland of *Banksia attenuata*, with or without isolated emergent *Acacia* spp., *Eucalyptus todtiana* or *Xylomelum angustifolium*, over *Ecdeiocolea monostachya*, *Mesomelaena pseudostygia* and *Lepidobolus* sp. sparse sedgeland; and
- **EmSL** – Isolated low shrubs of *Banksia attenuata*, *Banksia shuttleworthiana* and *Calothamnus glaber*, over *Ecdeiocolea monostachya*, *Mesomelaena pseudostygia* and *Lepidobolus* sp. sedgeland.

The majority of the Survey Area was mapped as **BaEmMS** vegetation (Figure 3.2), dominated by open mid-shrubland of *Banksia attenuata* over sedges. This can also be characterised as Kwongan scrub or heath, which is a prominent vegetation type (VT) within the region. Most of the vegetation within the Survey Area was assessed as being in ‘pristine’ condition, with the exception of vegetation surrounding the existing cleared well pad, which was assessed as being in ‘very good’ condition.

Table 3.2: Vegetation Types within the Survey Area, based on JBS&G 2022.

Vegetation Types	Area (Ha)	Percentage (%)
BaEmMs	38.11	85.2
EmSL	4.94	11.1
Cleared	1.67	3.7



Legend Survey Area Track Vegetation Type (Stratagen-JBS&G 2022) BaEmMS EmSL Cleared / Not vegetated	Scale 1:9,000 at A4			Perth Basin Ecological Studies Targeted Flora Survey Beharra Springs 2 and Beharra Springs 2 Deep LOCAL VEGETATION
	Coord. Sys. GDA2020 MGA Zone 50			
	Job No: 62676		FIGURE 3.2	
	Client: Beach Energy Limited			
	Version: A	Date: 09-Dec-2022		
	Drawn By: jcrute	Checked By: CT		

3.2 DBCA Threatened and Priority Flora Database Search Results

A database search was conducted prior to the field survey (DBCA ref 14-0722FL), covering the Survey Area and a buffer of 18 km (search area). A total of 72 species were listed in the search (refer Appendix B for full listing). There were no previous records within the Survey Area. The nearest records were:

- *Hemiandra* sp. Eneabba (H. Demarz 3687) - ~1200 m southeast; and
- *Paracaleana dixonii* (T) - ~1500 m southeast.

To assist with determining which species may occur in the Survey Area, a likelihood assessment was conducted based on the criteria in Table 3.3. The results of the likelihood assessment for Threatened flora is presented in Table 3.4, with the findings for all flora listed in the database search results presented in Appendix B. Those flora species with known records proximal to the Survey Area, which are therefore considered to have a 'Possible' or 'Likely' potential for occurrence are shown in Figure 3.3.

Table 3.3: Criteria for Flora Likelihood Assessment

Likelihood	Criteria
Recorded	Species or community has been recorded previously and/or from the field survey.
Likely	Species or community likely to occur as suitable habitat is present and existing records are close to the Survey Area (within 4.5 km).
Possible	Species or community might occur as there are existing records in the vicinity (within 9 km) and suitable habitat is likely to be present. Species or community may also be present if there is insufficient information to exclude presence.
Unlikely	Species or community is unlikely to occur as habitat is not present, or habitat is present, but there are no records within the vicinity.

A total of 13 'Threatened' flora species as listed under Section 178 of the EPBC Act and Section 19(1) of the BC Act were identified in the search area (Table 3.4 and Appendix B).

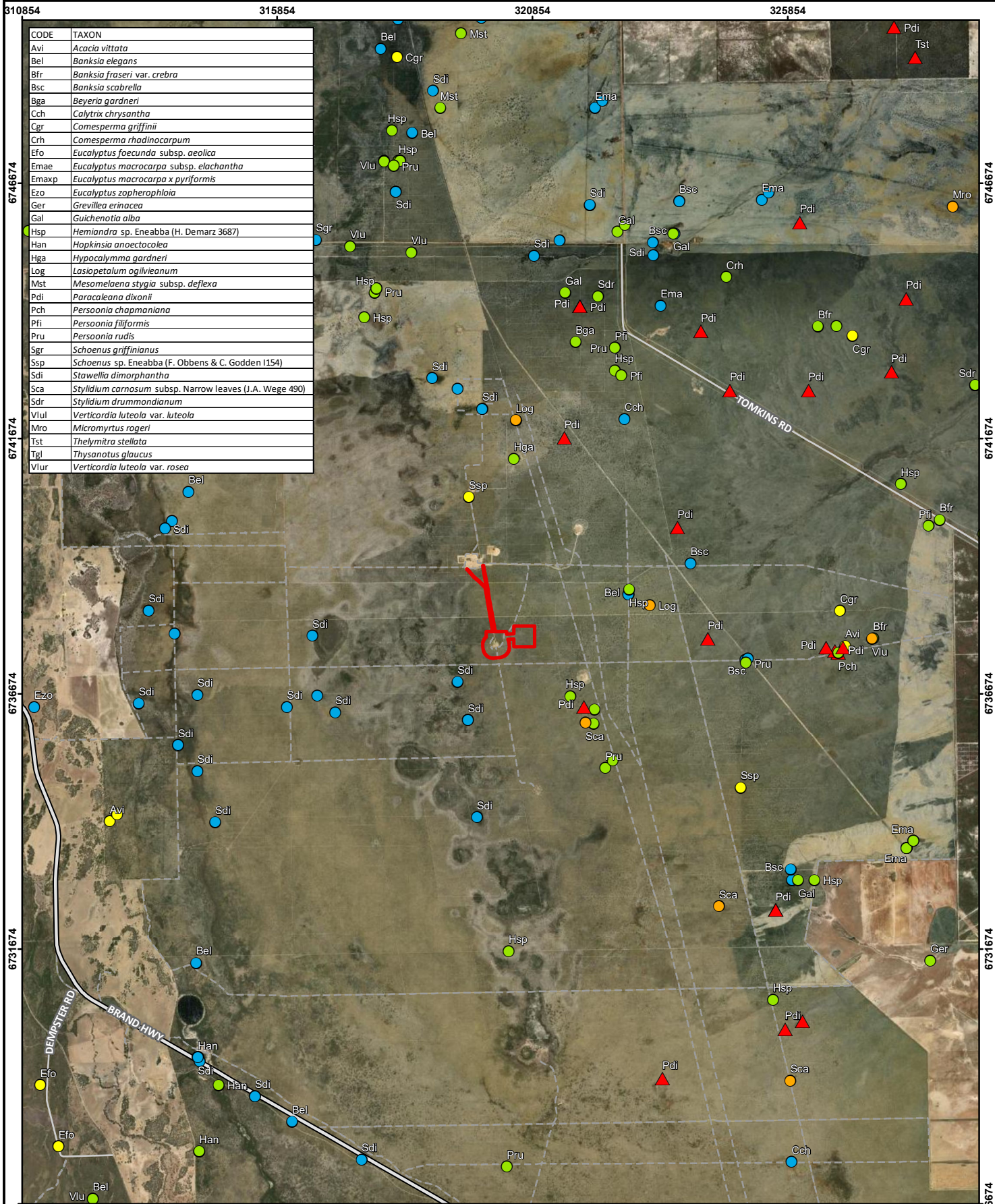
Table 3.4: Likelihood Assessment for Threatened Flora Species to Occur in Survey Area

Taxon	Conservation Status		Description	Likelihood of occurrence
	WA status	EPBC status		
<i>Andersonia gracilis</i>	VU	EN	A slender shrub up to 50 cm tall with few, spreading branches. Pink to pale mauve flowers are clustered in ovoid or oblong groups of 4 to 14 on terminal heads. Occurs on seasonally damp, black sandy clay flats near or on the margins of swamps, often on duplex soils supporting low open heath vegetation.	Unlikely (based on habitat preference)
<i>Conostylis dielsii</i> subsp. <i>teres</i>	VU	VU	A low, perennial monocot with terete leaves from 60-160 mm long and 0.5-1 mm wide. Short bristles of 0.8-1 mm long are present on the leaf margin and hairs on the leaf surface. Creamy yellow flowers appear from July to August. Occurs on sand/gravel.	Unlikely (based on lack of proximal records)
<i>Conostylis micrantha</i>	VU	VU	A low, perennial monocot with terete leaves from 70-145 mm long and 0.8-1 mm wide. Bristles of 8-10.5 mm length are present on the leaf margin, but the leaves are otherwise hairless. Yellow flowers appear from July to August. This species occurs in sandy areas.	Unlikely (based on lack of proximal records)
<i>Daviesia speciosa</i>	EN	EN	A low shrub with terete, pungent branchlets, that has a leafless appearance and red flowers that appear from April to May. Found in gravelly lateritic soils, undulating plains and rises.	Unlikely (based on lack of proximal records)
<i>Eucalyptus crispata</i>	EN	EN	A lignotuberous mallee from 3-7 m high, with rough bark on the trunk, in partly decorticated curls. Yellow-cream flowers appear from March to June. Prefers lateritic soils.	Unlikely (based on lack of proximal records)

Taxon	Conservation Status		Description	Likelihood of occurrence
	WA status	EPBC status		
<i>Eucalyptus leprophloia</i>	EN	EN	Lignotuberous mallee from 2-5(-8) m high with rough, loose & flaky bark to 1 m. Creamy white flowers appear from August to October. Occurs on a variety of soils.	Unlikely (based on lack of proximal records)
<i>Hakea megalosperma</i>	VU	VU	A spreading, lignotuberous shrub from 1-2 m high. White-cream/pink flowers appear from May to June; nuts are retained year-round. Occurs on grey sand, loam, lateritic hills and rocks.	Unlikely (based on lack of proximal records)
<i>Hemiandra gardneri</i>	CR	EN	Prostrate, pungent shrub, 0.1-0.2 m high, to 1 m wide. Fl. Red/pink-red, Aug to Oct. Grey or yellow sand, clayey sand. Sandplains.	Unlikely (based on lack of proximal records)
<i>Leucopogon obtectus</i> (<i>Styphelia obtecta</i> (Benth.) F. Muell.)	EN	EN	A spindly erect shrub from 0.5-1.7 m high, with leaves which closely clasp the stem, obscuring the ends of branchlets. Tiny white to creamy yellow flowers appear in the leaf axils from August to October. Occurs on grey sands.	Unlikely (Habitat not present and no records within the vicinity <9km)
<i>Paracaleana dixonii</i>	VU	EN	A tuberous perennial orchid from 90-200 mm high, with a single, small basal leaf. Brown-yellow-green-red flowers in the shape of a duck appear from October to December or January. Found in shrubland under <i>Banksia</i> on deep sand, or in heath on shallow sand over laterite.	Likely (based on habitat preference and location of previous records)
<i>Tetrateca nephelioides</i>	EN	CR	Caespitose, dwarf shrub, to 0.3 m high. Fl. Purple, Sep. White-grey sand, yellow-brown clayey sand, gravel, laterite. Outcrops, undulating hills, ridges.	Unlikely (based on habitat preference)
<i>Thelymitra stellata</i>	EN	EN	A tuberous, perennial orchid from 150-250 mm high. Its yellow and brown flowers appear from October to November. Occurs on sand, gravel and lateritic loam.	Unlikely (based on lack of proximal records)
<i>Wurmbea tubulosa</i>	VU	VU	A cormous, perennial herb growing at ground level, from 10-30 mm tall with only three leaves, two of them larger. White-pink flowers appear from June to August. Found in clay and loam on riverbanks and seasonally-wet places.	Unlikely (based on lack of proximal records)

The remaining species were listed as Priority flora species by the DBCA as follows:

- Priority 1 flora (P1) – 5 taxa,
- Priority 2 flora (P2) – 12 taxa,
- Priority 3 flora (P3) – 29 taxa, and
- Priority 4 flora (P4) – 12 taxa.



CODE	TAXON
Avi	<i>Acacia vittata</i>
Bel	<i>Banksia elegans</i>
Bfr	<i>Banksia fraseri</i> var. <i>crebra</i>
Bsc	<i>Banksia scabrella</i>
Bga	<i>Beyeria gardneri</i>
Cch	<i>Calytrix chrysantha</i>
Cgr	<i>Comesperma griffinii</i>
Crh	<i>Comesperma rhadinocarpum</i>
Efo	<i>Eucalyptus foecunda</i> subsp. <i>aeolica</i>
Emae	<i>Eucalyptus macrocarpa</i> subsp. <i>elachantha</i>
Emaxp	<i>Eucalyptus macrocarpa</i> x <i>pyriformis</i>
Ezo	<i>Eucalyptus zopherophloia</i>
Ger	<i>Grevillea erinacea</i>
Gal	<i>Guichenotia alba</i>
Hsp	<i>Hemiandra</i> sp. <i>Eneabba</i> (H. Demarz 3687)
Han	<i>Hopkinsia anoetocolea</i>
Hga	<i>Hypocalymma gardneri</i>
Log	<i>Lasiopetalum ogilvieanum</i>
Mst	<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>
Pdi	<i>Paracaleana dixonii</i>
Pch	<i>Persoonia chapmaniana</i>
Pfi	<i>Persoonia filiformis</i>
Pru	<i>Persoonia rudis</i>
Sgr	<i>Schoenus griffinianus</i>
Ssp	<i>Schoenus</i> sp. <i>Eneabba</i> (F. Obbens & C. Godden 1154)
Sdi	<i>Stawellia dimorphantha</i>
Sca	<i>Stylidium carnosum</i> subsp. <i>Narrow leaves</i> (J.A. Wege 490)
Sdr	<i>Stylidium drummondianum</i>
Vlu	<i>Verticordia luteola</i> var. <i>luteola</i>
Mro	<i>Micromyrtus rogeri</i>
Tst	<i>Thelymitra stellata</i>
Tgl	<i>Thysanotus glaucus</i>
Vlur	<i>Verticordia luteola</i> var. <i>rosea</i>

Legend

- Survey Area
- Highways
- Minor road
- Track

Conservation Status

- ▲ T
- P1
- P2
- P3
- P4

Scale 1:100,000 at A4			
Coord. Sys. GDA2020 MGA Zone 50			
Job No: 62676			
Client: Beach Energy Limited			
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Drawn By: jcrute	Checked By: CT		

**Perth Basin Ecological Studies
Targeted Flora Survey**

**Beharra Springs 2 and
Beharra Springs 2 Deep**

DATABASE SEARCH RESULTS

FIGURE 3.3

3.3 EPBC Act Protected Matters Database Search Results

One EPBC Act listed species, *Paracaleana dixonii* (the Sandplain Duck Orchid [VU; EN]), was considered as being relevant to the Survey Area. Numerous records of this taxon are known from the vicinity, particularly in areas of unfragmented native vegetation to the immediate east of the Survey Area. Conservation Advice published in 2008 (DEWHA 2008) estimated that there were 57 plants occurring within eight extant populations, distributed across an approximately 540 km² range between Gingin and Dongara.

This diminutive plant is most detectable when flowering in November to January, or after summer fires when flowers proliferate, however, vegetative structures are absent for much of the year. This means there is a very specific and narrow survey period within which to assess presence of the Sandplain Duck Orchid.

Following significant surveys for the species south-east of Dongara, Woodman Environmental Consulting (2013) described the key local habitats for the taxon as:

- Low open woodland of Pricklybark (*Eucalyptus todtiana*) over mid to low shrubland of mixed species dominated by Dwarf Sheoak (*Allocasuarina humilis*), Burma Road Banksia (*Banksia scabrella*), *Calothamnus sanguineus*, *Eremaea beaufortoides* var. *microphylla*, *Melaleuca* aff. *Leuropoma* and *Hibbertia hypericoides* over low shrubland and sedgeland of mixed species including *Banksia dallanneyi* subsp. *media*, *Conostylis canteriata*, *Mesomelaena pseudostygia* and *Caustis dioica* on grey or brown sand on lower and mid slopes.
- Mid sparse to open shrubland of mixed species including *Calothamnus quadrifidus* subsp. *angustifolius*, *Grevillea biformis* subsp. *biformis* and Coast Banksia (*Banksia attenuata*) over low shrubland and sedgeland of mixed species dominated by *Ecdeiocolea monostachya*, *Melaleuca leuropoma*, *Daviesia divaricata* subsp. *divaricata*, *Mesomelaena pseudostygia* and *Banksia shuttleworthiana* on yellow-brown or occasionally grey sand on slopes and valley floors.
- Mid mallee woodland to isolated mallees of *Eucalyptus conveniens* or mid open shrubland of *Allocasuarina campestris* over low shrubland and sedgeland of mixed species dominated by Pink Dryandra (*Banksia carlinoides*), *Ecdeiocolea monostachya*, *Hakea 12enticulat*, *Hibbertia hypericoides* and *Melaleuca aspalathoides* on gravelly grey or brown clay loams or sands, usually with laterite on or near the surface, on slopes and crests.

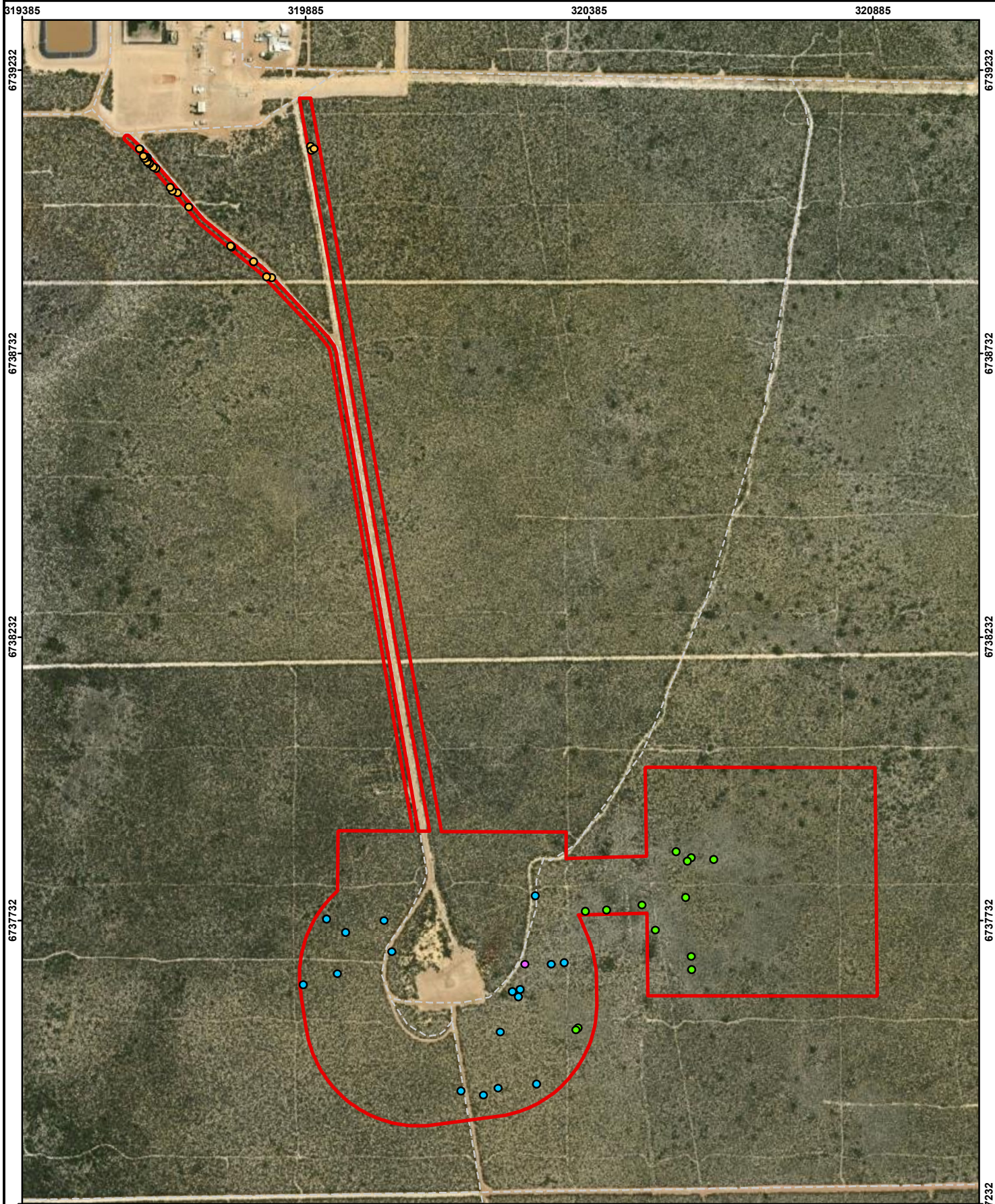
4. Survey Results

4.1 Summary of findings

During targeted searches over the Survey Area, a total of four Priority taxa were recorded. No Threatened flora were recorded. A summary of the flora recorded, the number of locations at which they were found and abundance is presented in Table 4.1. The distribution of the records within the Survey Area is presented in Figure 4.1.

Table 4.1: Priority Flora Recorded in the Survey Area During Targeted Searches Conducted in Spring 2022.

Species	Conservation code	Recorded locations	Plant count
<i>Banksia elegans</i>	P4	23	26
<i>Beyeria gardneri</i>	P3	13	15
<i>Schoenus griffinianus</i>	P4	1	1
<i>Tricoryne</i> sp. <i>Wongan Hills</i> (B.H. Smith 794)	P2	17	43



Legend Survey Area Track Conservation-listed Flora <i>Banksia elegans</i> (P4) <i>Beyeria gardneri</i> (P3) <i>Schoenus griffinianus</i> (P4) <i>Tricoryne</i> sp. Wongan Hills (B.H. Smith 794) (P2)	Scale 1:9,000 at A4		 	Perth Basin Ecological Studies Targeted Flora Survey Beharra Springs 2 and Beharra Springs 2 Deep CONSERVATION-LISTED FLORA
	Coord. Sys. GDA2020 MGA Zone 50			
	Job No: 62676		FIGURE 4.1 	
	Client: Beach Energy Limited			
	Version: A	Date: 09-Dec-2022		
Drawn By: jcrute	Checked By: CT			

4.2 Limitations

Potential or actual limitations of surveys need to be assessed to meet the requirements of the EPA (2016b). An assessment of the potential limitations associated with the targeted flora searches over the Survey Area is presented in Table 4.2.

Table 4.2: Survey constraints analysis.

Potential limitation	Constraint (yes/no, significant, moderate or negligible)	Comments
Availability of contextual information at a local and regional scale	No	The Survey Area was in an area that has been subject to extensive surveying.
Competence/experience of the team conducting the survey, including experience in the bioregion surveyed	No	The survey team was led by a botanist with over five years of experience specific to the bioregion and included a botanist with over three years of experience in the region and two botanists with less than two years of experience in the region.
Proportion of the flora recorded and/or collected, and any identification issues	No	Potential species that could occur in the Survey Area had been clearly identified. Samples of flora that could not be confidently identified in the field were taken and provided to expert taxonomists for confirmation.
Was the appropriate area fully surveyed (effort and extent)	No	The area was surveyed using parallel traverses spaced approximately 10 m from each other. All areas were surveyed on foot.
Access restrictions within the survey area	No	All areas that needed to be surveyed were able to be accessed by foot.
Survey timing, rainfall, season of survey	No	The survey was timed to coincide with flowering and emergence times of key flora of conservation significance that had the potential to occur in the area and was conducted after a period in which above average rainfall had been received.
Disturbances that may have affected the results of the survey e.g., fire, flood, clearing	Negligible	The survey incorporated some areas that were adjacent to access tracks and an out of service well pad and thus had been subject to some degree of disturbance.

5. Discussion

The distribution of Priority flora recorded during the survey separates into two distinct groupings. All records of *Banksia elegans* (P4) were in the northern sections of the access track corridor near the existing Beharra Springs processing plant and administration area. This location and the vegetation to the north and northwest of the current administration and operations sites has been observed as hosting numerous individuals of this species. DBCA records contain 12 distinct populations of *B. elegans* within a 10 km radius of the Survey Area, with six of these in conservation reserves. This species has a known range from east of Jurien Bay to east of Geraldton (WAH 1998-2022). The scale of impacts associated with this species are considered to be moderate on a local scale but low on a regional scale.

The remaining records of Priority flora were all made in the Beharra 2 and Deep survey areas. *Tricoryne* sp. Wongan Hills (B.H. Smith 794) (P2) was recorded in the Beharra 2 survey area. There was only one record of this species in the DBCA database search results. This species is known from a small number of populations; however, these are distributed between the Perth hills and Mingenew (WAH 1998-2022). There is the potential that there are populations of this species that have not been recorded, but based on current information, the scale of impacts associated with the proposed activities should be considered significant on both a local and regional scale.

Most records of *Beyeria gardneri* (P3) were in the proposed Beharra 2 Deep lease area. There were three records of this species in the DBCA database search results, with two of these in conservation reserves. While the database search records were limited, it is noted that this species is recorded from east of Cervantes to northeast of Kalbarri (WAH 1998-2022). With local populations in the conservation estate and a wide distribution, it is proposed that the scale of impacts to this species are moderate on a local level but low on a regional level.

The single record of *Schoenus griffinianus* (P4) made during the survey was in the Beharra 2 survey area. There were three records of this species recorded in the DBCA database search result, all of which were located outside of conservation reserves. This species has a distribution from east of Perth to southeast of Geraldton (WAH 1998-2022). Based on the distribution of this *S. griffinianus*, it is proposed that the scale of impacts to this species is low on both a local and regional scale.

The likelihood assessment for species listed in the DBCA database search for the area has been updated based on data collected during the targeted searches. This summary is presented in Appendix B (Table B1). The species for which an assessment of 'possible' has been made are mostly small herbaceous species. While not observed during the survey, there is a residual potential for these to be present. The results of this study provide an overall estimate of Priority flora within the Survey Area; however, it should be noted that the actual numbers of smaller species such as *Schoenus griffinianus* and *Tricoryne* sp. Wongan Hills (B.H. Smith 794) may be higher than those recorded during the targeted searches.

6. Recommendations

It is recommended that, as far as is practicable, the disturbance associated with the vegetation in the Survey Area is minimised, and, where possible, populations of flora of conservation significance are avoided.

7. Limitations

This report has been prepared for use by the client who has commissioned the works in accordance with the project brief only, and has been based in part on information obtained from the client and other parties.

The advice herein relates only to this project and all results conclusions and recommendations made should be reviewed by a competent person with experience in environmental investigations, before being used for any other purpose.

JBS&G accepts no liability for use or interpretation by any person or body other than the client who commissioned the works. This report should not be reproduced without prior approval by the client, or amended in any way without prior approval by JBS&G, and should not be relied upon by other parties, who should make their own enquires.

Sampling and chemical analysis of environmental media is based on appropriate guidance documents made and approved by the relevant regulatory authorities. Conclusions arising from the review and assessment of environmental data are based on the sampling and analysis considered appropriate based on the regulatory requirements.

Limited sampling and laboratory analyses were undertaken as part of the investigations undertaken, as described herein. Ground conditions between sampling locations and media may vary, and this should be considered when extrapolating between sampling points. Chemical analytes are based on the information detailed in the site history. Further chemicals or categories of chemicals may exist at the site, which were not identified in the site history and which may not be expected at the site.

Changes to the subsurface conditions may occur subsequent to the investigations described herein, through natural processes or through the intentional or accidental addition of contaminants. The conclusions and recommendations reached in this report are based on the information obtained at the time of the investigations.

This report does not provide a complete assessment of the environmental status of the site, and it is limited to the scope defined herein. Should information become available regarding conditions at the site including previously unknown sources of contamination, JBS&G reserves the right to review the report in the context of the additional information.

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Appendix A Definitions and Classifications

Table A.1: EPBC Act categories for threatened species

Category	Threatened species
Extinct	A native species is eligible to be included in the extinct category at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
Extinct in the wild	A native species is eligible to be included in the extinct in the wild category at a particular time if, at that time: <ul style="list-style-type: none"> (a) it is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or (b) it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
Critically Endangered (CE)	A native species is eligible to be included in the <i>critically endangered</i> category at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
Endangered (EN)	A native species is eligible to be included in the <i>endangered</i> category at a particular time if, at that time: <ul style="list-style-type: none"> (a) it is not critically endangered; and (b) it is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
Vulnerable (VU)	A native species is eligible to be included in the <i>vulnerable</i> category at a particular time if, at that time: <ul style="list-style-type: none"> (a) it is not critically endangered or endangered; and (b) it is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
Conservation Dependent	A native species is eligible to be included in the conservation dependent category at a particular time if, at that time: <ul style="list-style-type: none"> (a) the species is the focus of a specific conservation program the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or (b) the following subparagraphs are satisfied: <ul style="list-style-type: none"> (i) the species is a species of fish; (ii) the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long-term survival in nature are maximised; (iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory; (iv) cessation of the plan of management would adversely affect the conservation status of the species.

Table A.2: Conservation codes for Western Australian flora and fauna (DBCA 2020b)

Conservation Codes for Western Australian Flora and Fauna	
<p>Threatened, Extinct and Specially Protected fauna or flora¹ are species² which have been adequately searched for and are deemed² to be, in the wild, threatened, extinct or in need of special protection, and have been gazetted as such.</p> <p><i>The Wildlife Conservation (Specially Protected Fauna) Notice 2018 and the Wildlife Conservation (Rare Flora) Notice 2018 have been transitioned under regulations 170, 171 and 172 of the Biodiversity Conservation Regulations 2018 to be the lists of Threatened, Extinct and Specially Protected species³ under Part 2 of the Biodiversity Conservation Act 2016.</i></p> <p>Categories of Threatened, Extinct and Specially Protected fauna and flora are:</p>	
T	<p>Threatened species</p> <p>Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened species under section 26(2) of the Biodiversity Conservation Act 2016 (BC Act).</p> <p>Threatened fauna is the species of fauna that are listed as critically endangered, endangered or vulnerable threatened species.</p> <p>Threatened flora is the species of flora that are listed as critically endangered, endangered or vulnerable threatened species.</p> <p>The assessment of the conservation status of threatened species is in accordance with the BC Act listing criteria and the requirements of Ministerial Guideline (Number 1) and Ministerial Guideline (Number 2) that adopts the use of the International Union for Conservation of Nature (IUCN) Red List of Threatened Species Categories and Criteria⁴, and is based on the national distribution of the species.</p>
CR	<p>Critically endangered species</p> <p>Threatened species considered to be <i>“facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines”</i>.</p> <p>Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines.</p>
EN	<p>Endangered species</p> <p>Threatened species considered to be <i>“facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines”</i>.</p> <p>Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines.</p>
VU	<p>Vulnerable species</p> <p>Threatened species considered to be <i>“facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines”</i>.</p> <p>Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines.</p>
<p>Extinct species</p> <p>Listed by order of the Minister as extinct under section 23(1) of the BC Act as extinct or extinct in the wild.</p>	
EX	<p>Extinct species</p> <p>Species where <i>“there is no reasonable doubt that the last member of the species has died”</i>, and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).</p>
EW	<p>Extinct in the wild species</p> <p>Species that <i>“is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form”</i>, and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).</p> <p>Currently there are no fauna or flora species listed as extinct in the wild.</p>
P	<p>Priority species</p> <p><u>Priority is not a listing category under the BC Act.</u></p> <p>All fauna and flora are protected in WA following the provisions in Part 10 of the BC Act. The protection applies even when a species is not listed as threatened or specially protected, and regardless of land tenure (State managed land (Crown land), private land, or Commonwealth land).</p> <p>Species that may possibly be threatened species that do not meet the criteria for listing under the BC Act because of insufficient survey or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of prioritisation for survey and evaluation of conservation status so that consideration can be given to potential listing as threatened.</p> <p>Species that are adequately known, meet criteria for near threatened, or are rare but not threatened, or that have been recently removed from the threatened species list or conservation dependent or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species require regular monitoring.</p> <p>Assessment of priority status is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.</p>
1	<p>Priority 1: Poorly-known species - known from few locations, none on conservation lands</p> <p>Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, for example, agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation.</p> <p>Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements for threatened listing and appear to be under immediate threat from known threatening processes. These species are in urgent need of further survey.</p>

Conservation Codes for Western Australian Flora and Fauna	
2	<p>Priority 2: Poorly-known species - known from few locations, some on conservation lands</p> <p>Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, for example, national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation.</p> <p>Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements for threatened listing and appear to be under threat from known threatening processes. These species are in urgent need of further survey.</p>
3	<p>Priority 3: Poorly-known species - known from several locations</p> <p>Species that are known from several locations and the species does not appear to be under imminent threat or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat.</p> <p>Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. These species need further survey.</p>
4	<p>Priority 4: Rare, Near Threatened and other species in need of monitoring</p> <p>(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection but could be if present circumstances change. These species are usually represented on conservation lands.</p> <p>(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for vulnerable but are not listed as a conservation dependent specially protected species.</p> <p>(c) Species that have been removed from the list of threatened species or lists of conservation dependent or other specially protected species, during the past five years for reasons other than taxonomy.</p> <p>(d) Other species in need of monitoring.</p>
<p>¹ The definition of flora includes algae, fungi, and lichens.</p> <p>² Species includes all taxa (plural of taxon - a classificatory group of any taxonomic rank, e.g. a family, genus, species or any infraspecific category i.e. subspecies or variety, or a distinct population).</p> <p>³ Schedules are not referred to when stating the listing status of threatened, extinct or specially protected species under the BC Act. See the examples provided under each listing category.</p> <p>⁴ Western Australia has assigned species to threat categories using the IUCN Red List of Threatened Species Categories and Criteria since 1996 (referencing all criteria). At the national level, threatened species listings under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) reference only some of the IUCN criteria (http://www.environment.gov.au/biodiversity/threatened/nominations/forms-and-guidelines).</p>	

Appendix B Likelihood of Occurrence Assessment

Table B.1: Flora Likelihood of Occurrence

Taxon	Conservation Status		Description	PMST Attribution	Desktop Likelihood of occurrence within Beharra Gas Facility project area	Post-field Likelihood of occurrence within Beharra Springs 2, Beharra Springs 2 Deep and access tracks
	BC Act	EPBC Act				
<i>Acacia latipes</i> subsp. <i>licina</i>	P3		Pungent shrub, 0.4-1.2 m high. Fl. yellow, Jun to Sep. White sand, granitic soils. Limestone hills, sandplains.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Acacia vittata</i>	P2		Dense, rounded shrub, 1-4 m high. Fl. yellow, Aug. Grey sand, sandy clay. Margins of seasonal lakes.		Possible Habitat present and records within the vicinity	Unlikely
<i>Andersonia gracilis</i>	VU	EN	Slender erect or open straggly shrub, 0.1-0.5(-1) m high. Fl. white-pink-purple, Sep to Nov. White/grey sand, sandy clay, gravelly loam. Winter-wet areas, near swamps.	Species or species habitat likely to occur within area	Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Anthocercis intricata</i>	P3		Dense, spinescent shrub, 0.9-3 m high. Fl. white-cream, Jun to Sep. Sand or loam over limestone. Consolidated sand dunes.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Baeckea</i> sp. Walkaway (A.S. George 11249)	P3		Dense, multi-stemmed shrub, 0.5-2 m high. Fl. white, Dec or Jan. Yellow/brown or white sand. Undulating plains, hillslopes.		Possible Habitat present and records within the vicinity	Unlikely
<i>Banksia cypholoba</i>	P3		Prostrate, dwarf, lignotuberous shrub, to 0.3 m high. Fl. yellow-brown, Aug. Sand & gravelly loam.		Possible Habitat present but no records within the vicinity (<9km)	Possible
<i>Banksia elegans</i>	P4		Shrub (with fire-tolerant rootstock, often suckering), 1-4 m high. Fl. yellow/green-yellow, Oct to Nov. Yellow, white or red sand. Sandplains, low consolidated dunes.		Likely Habitat present and existing close records	Recorded
<i>Banksia fraseri</i> var. <i>crebra</i>	P3		Shrub usually less than 50 cm high. Leaf lobes linear, glaucous. Sandy loam or sandy clay over laterite, in kwongan. Fl. July and August.		Likely Habitat present and records within the vicinity	Unlikely
<i>Banksia scabrella</i>	P4		Much-branched, lignotuberous shrub, 0.6-2 m high. Fl. yellow & cream & purple, Sep to Dec or Jan. White, grey or yellow sand, sometimes with lateritic gravel. Sandplains, lateritic ridges.		Likely Habitat present and existing close records	Unlikely
<i>Beyeria cinerea</i> subsp. <i>cinerea</i>	P3		A spreading, erect or prostrate succulent shrub to 70cm, with both male and female, inconspicuous flowers that 1enticulaticable petals, with flowers consisting of a yellow-green calyx. Flowers appear in July and from September to November. Subspecies cinerea has leaf blades with truncate to cuneate bases rather than cordate bases. It grows in coastal heath and shrubland on sandy soils over limestone.		Unlikely Habitat not present and no records within the vicinity (<9km)	Unlikely

Taxon	Conservation Status		Description	PMST Attribution	Desktop Likelihood of occurrence within Beharra Gas Facility project area	Post-field Likelihood of occurrence within Beharra Springs 2, Beharra Springs 2 Deep and access tracks
	BC Act	EPBC Act				
<i>Beyeria gardneri</i>	P3		Shrub, 0.25-0.5 m high. Fl. yellow, Aug to Sep. Yellow sand.		Likely Habitat present and existing close records	Recorded
<i>Cala2enticulateculata</i> subsp. <i>albicans</i>	P1		15-35 cm height. Flowers dull white or cream. Labellum white with red stripes, spots and blotches. Column opaque cream with red stripes, spots and blotches. Grows in a variety of habitats as well as moist, calcareous sand under Eucalyptus camaldulensis and Acacia species. Also known as <i>Cala2enticulateculata</i> subsp. <i>Arrowsmith</i> . Flowers 7-10cm long x 5-9 cm wide.		Unlikely Habitat not present and no records within the vicinity (<9km)	Unlikely
<i>Calytrix chrysantha</i>	P4		Shrub, 0.3-1.3 m high. Fl. yellow, Dec or Jan to Feb. White, grey or yellow/brown sand. Flats.		Likely Habitat present and existing close records	Unlikely
<i>Calytrix eneabensis</i>	P4		Shrub, 0.3-1 m high. Fl. purple & pink & yellow, Jul to Oct. White, grey or yellow sand over laterite. Sandplains.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Calytrix superba</i>	P4		Shrub, 0.2-1 m high. Fl. pink-red, Dec or Jan to Feb. Sand over laterite. Flats.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Centrolepis milleri</i>	P3		Specimens of <i>C. milleri</i> grow with their leaves mostly buried by sand. <i>Centrolepis milleri</i> superficially resembles <i>C. drummondiana</i> , but differs from it in the presence of two to five cataphylls at the base of a scape, in the absence of a spikelet in the axil of the lower primary bract, in the dimorphic morphology of the primary bracts and in the presence of one long and one short tepal-like phyllome associated with each flower. The absence of a spikelet in the axil of the lower primary bract and the dimorphic nature of the primary bracts are shared with species such as <i>C. polygyna</i> and <i>C. glabra</i> , to which <i>C. milleri</i> is apparently related. Spring flowering.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Comesperma griffinii</i>	P2		Annual or perennial, herb, to 0.15 m high. Fl. white, Oct. Yellow or grey sand. Plains.		Possible Habitat present and records within the vicinity	Unlikely
<i>Comesperma rhadinocarpum</i>	P3		Perennial, herb. Fl. blue, Oct to Nov. Sandy soils.		Possible Habitat present and records within the vicinity	Unlikely
<i>Conostylis dielsii</i> subsp. <i>teres</i>	VU	EN	Shortly rhizomatous, tufted perennial, grass-like or herb, 0.13-0.33 m high, leaves terete. Fl. cream-yellow, Jul to Aug. White, grey or yellow sand, gravel. Low open woodland.	Species or species habitat likely to occur within area	Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Conostylis micrantha</i>	VU	EN	Rhizomatous, tufted perennial, grass-like or herb, 0.13-0.24 m high. Fl. yellow-cream/red, Jul to Aug. White or grey sand. Sandplains.	Species or species habitat known to occur within area	Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely

Taxon	Conservation Status		Description	PMST Attribution	Desktop Likelihood of occurrence within Beharra Gas Facility project area	Post-field Likelihood of occurrence within Beharra Springs 2, Beharra Springs 2 Deep and access tracks
	BC Act	EPBC Act				
<i>Dampiera tephrea</i>			Ascending to erect perennial, herb or shrub, 0.3-0.6 m high, with grey or yellowish hairs on abaxial surface of leaves. Fl. blue, Jul. Sand, gravelly loam.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Daviesia speciosa</i>	EN	EN	Many-stemmed shrub, 0.3-0.8 m high. Fl. red, Apr to May. Gravelly lateritic soils. Undulating plains, rises.	Species or species habitat known to occur within area	Unlikely Habitat not present and no records within the vicinity (<9km)	Unlikely
<i>Eucalyptus crispata</i>	EN	EN	A lignotuberous mallee from 3-7 m high, with rough bark on the trunk, in partly decorticated curls. Yellow-cream flowers appear from March to June. Prefers lateritic soils.	Species or species habitat likely to occur within area	Unlikely Habitat not present and no records within the vicinity (<9km)	Unlikely
<i>Eucalyptus foecunda</i> subsp. <i>aeolica</i>	P2		Distinguished from <i>E. foecunda</i> subsp. <i>foecunda</i> by its consistently dull, grey-green seedling leaves that are pruinose, at least on the new growth. White, yellowish or pale brown coastal sands overlying limestone, often on limestone dunes, in mallee shrubland or low open woodland. Associated eucalypts include <i>Eucalyptus erythrocorys</i> , <i>E. obtusiflora</i> subsp. <i>dongarrensensis</i> , <i>E. petrensis</i> and <i>E. zopherophloia</i> .		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Eucalyptus leprophloia</i>	EN	EN	(Mallee), 2-5(-8) m high, bark rough loose & flaky to 1 m. Fl. cream-white, Aug to Oct. White or grey sand over laterite. Valley slopes.	Species or species habitat known to occur within area	Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Eucalyptus macrocarpa</i> subsp. <i>elachantha</i>	P4		(Spreading or sprawling mallee), 0.8-4 m high, bark smooth, grey over salmon pink. Fl. red-pink, Aug to Sep or Nov to Dec. White or grey sand over laterite. Hillslopes, ridges, sandplains.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Eucalyptus macrocarpa</i> x <i>pyriformis</i>	P3		Erect, open mallee tree, 1.2-6 m high. Fl. red, Apr or Aug to Oct. Sand, lateritic sandy soils. Hills, rocky ironstone ridges, sandplains.		Likely Habitat present and existing close records	Unlikely
<i>Eucalyptus zopherophloia</i>	P4		(Spreading mallee), 2.5-4(-6) m high, bark rough, fibrous. Fl. cream-white, Oct to Dec or Jan. Grey/white sand with limestone rubble. Coastal areas.		Unlikely Habitat not present and no records within the vicinity (<9km)	Unlikely
<i>Grevillea erinacea</i>	P3		Spindly, prickly, sparingly branched shrub, (0.3-)0.6-1.8 m high. Fl. green-white-cream, Jul to Dec. White, grey or yellow sand, often with lateritic gravel.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Guichenotia alba</i>	P3		Slender, lax, few-branched shrub, 0.1-0.45 m high. Fl. white, Jul to Aug. Sandy & gravelly soils. Low-lying flats, depressions.		Likely Habitat present and existing close records	Unlikely

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	BC Act	EPBC Act				
<i>Guichenotia quasicalva</i>	P2		Erect, compact shrub, to 0.5 m high. Fl. blue-purple, Sep to Oct. Sandy clay over laterite. Drainage line.		Unlikely Habitat not present and no records within the vicinity (<9km)	Unlikely
<i>Hakea megalosperma</i>	VU	VU	Spreading, lignotuberous shrub, 1-2 m high. Fl. white-cream/pink, May to Jun. Grey sand, loam. Lateritic hills & rocks.	Species or species habitat may occur within area	Unlikely Habitat not present and no records within the vicinity (<9km)	Unlikely
<i>Haloragis foliosa</i>	P3		Perennial, herb or shrub, 0.2-0.5 m high. White/grey sand over limestone.		Unlikely Habitat not present and no records within the vicinity (<9km)	Unlikely
<i>Hemiandra gardneri</i>	CR	EN	Prostrate, pungent shrub, 0.1-0.2 m high, to 1 m wide. Fl. red/pink-red, Aug to Oct. Grey or yellow sand, clayey sand. Sandplains.	Species or species habitat may occur within area	Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Hemiandra</i> sp. Eneabba (H. Demarz 3687)	P3		Straggly, erect shrub, 0.5-0.9 m high, to 0.4 m wide. Fl. blue/violet, Feb. Sand. Disturbed sites.		Likely Habitat present and existing close records	Unlikely
<i>Hemigenia saligna</i>	P3		Shrub, 0.3-1 m high. Fl. blue-purple/violet, Jul to Oct. Lateritic & sandy soils.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Hopkinsia anoectocolea</i>	P3		Rhizomatous, tufted perennial, herb, 0.5-1 m high, to 1 m in diameter. Fl. brown, Sep to Dec. White or grey sand, often saline. Winter-wet depressions, floodplains, salt lakes.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Hypocalymma gardneri</i>	P3		Shrub, to 0.3 m high. Fl. yellow, Aug to Sep. Grey-brown sand, laterite. Sandplains, upper slopes, heathland.		Likely Habitat present and existing close records	Unlikely
<i>Hypocalymma tetrapterum</i>	P3		Shrub, 0.4-0.9 m high. Fl. white, Aug. Grey sand, loam, lateritic gravel. Riverbanks, breakaways.		Unlikely Habitat not present and no records within the vicinity (<9km)	Unlikely
<i>Lasiopetalum ogilvieanum</i>	P1		Shrub, 0.45-1.5 m high. Fl. pink-white, Jul to Oct. White/grey or yellow sand, stony loam. Undulating plains, lateritic rises.		Likely Habitat present and existing close records	Unlikely
<i>Leucopogon obtectus</i> (<i>Styphelia obtecta</i> (Benth.) F.Muell.)	EN	EN	A spindly erect shrub from 0.5-1.7 m high, with leaves which closely clasp the stem, obscuring the ends of branchlets. Tiny white to creamy yellow flowers appear in the leaf axils from August to October. Occurs on grey sands.	Species or species habitat likely to occur within area	Unlikely Habitat not present and no records within the vicinity (<9km)	Unlikely

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	BC Act	EPBC Act				
<i>Mesomelaena stygia</i> subsp. <i>deflexa</i>	P3		Tufted perennial, grass-like or herb (sedge), 0.1-0.5 m high. Fl. brown-black, Mar to Oct. White, grey or lateritic sand, clay, gravel.		Likely Habitat present and existing close records	Unlikely
<i>Micromyrtus rogeri</i>	P1		Shrub, 0.2-0.4 m high. Fl. white, Jul to Oct. Yellow-brown sandy soils, gravel, laterite. Breakaways.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Paracaleana dixonii</i>	VU	EN	A tuberous perennial orchid from 90-200 mm high, with a single, small basal leaf. Brown-yellow-green-red flowers in the shape of a duck appear from October to December or January. Found in shrubland under Banksia on deep sand, or in heath on shallow sand over laterite.	Species or species habitat known to occur within area	Likely Habitat present and existing close records	Unlikely
<i>Persoonia chapmaniana</i>	P3		Erect, spreading shrub, 1-2 m high. Fl. yellow, Sep to Nov. White sandy clay, yellow sand. Vicinity of salt lakes.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Persoonia filiformis</i>	P3		Erect, spreading, lignotuberous shrub, 0.07-0.4 m high. Fl. yellow, Nov to Dec. Yellow or white sand over laterite.		Likely Habitat present and existing close records	Unlikely
<i>Persoonia rudis</i>	P3		Erect, often spreading shrub, 0.2-1 m high. Fl. yellow, Sep to Dec or Jan. White, grey or yellow sand, often over laterite.		Likely Habitat present and existing close records	Unlikely
<i>Pityrodia viscida</i>	P4		Viscid shrub, 0.3-0.6(-1) m high. Fl. white, Sep to Dec or Jan to Feb. Lateritic sand.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Schoenus badius</i>	P2		Slender annual, grass-like or herb (sedge), 0.05-0.12 m high. Fl. brown-green, Sep to Oct. Grey sand. Moist areas.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Schoenus griffinianus</i>	P4		Small, tufted perennial, grass-like or herb (sedge), to 0.1 m high. Fl. Sep to Oct. White sand.		Likely Habitat present and existing close records	Recorded
<i>Schoenus</i> sp. Eneabba (F. Obbens & C. Godden 1154)	P2		Erect, clumped rhizomatous, perennial, grass-like or herb (sedge), to 0.75 m high. Grey, yellow or white sand. Undulating sandplains, mid slopes, tops of rises.		Likely Habitat present and existing close records	Possible
<i>Scholtzia calcicola</i>	P2		Erect, dense shrub to 2 m high, with tiny, pale pink flowers in a raceme-like arrangement and a wrinkled hypanthium. It has the smallest flowers in the genus at 2.5-3.5 mm diameter and with petals 1-1.2 mm long. Commonly has 5 stamens, with 0-2 opposite each sepal. Recorded from near Dongara south to Drovers Cave National Park in heath on shallow sand over limestone.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Stawellia dimorphantha</i>	P4		Stilt-rooted perennial, herb, 0.05-0.2 m high. Fl. purple/cream, Jun to Nov. White, grey, yellow sand.		Likely Habitat present and existing close records	Unlikely

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	BC Act	EPBC Act				
<i>Stylidium carnosum</i> subsp. Narrow leaves (J.A. Wege 490)	P1		Cormaceous herb to 1m with white flowers between Oct – Nov.		Likely Habitat present and existing close records	Possible
<i>Stylidium drummondianum</i>	P3		Rosetted perennial, herb, 0.05-0.22 m high, Leaves narrowly oblanceolate, 0.5-3 cm long, 0.8-2 mm wide, apex mucronate, margin hyaline and serrulate, glabrous. Scape hoary. Inflorescence paniculate. Fl. pink, Aug to Oct. Sand or clayey sand over laterite. Upper hillslopes, breakaways. Low heath, mallee shrubland.		Likely Habitat present and existing close records	Possible
<i>Stylidium longitubum</i>	P4		Erect annual (ephemeral), herb, 0.05-0.12 m high. Fl. pink, Oct to Dec. Sandy clay, clay. Seasonal wetlands.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Stylidium pseudocaespitosum</i>	P2		Rosetted perennial, herb, 0.1-0.3 m high, leaves tufted, linear, 2-7 cm long, 0.5-2 mm wide, apex subacute, margin entire, scabrous. Scape glabrous. Inflorescence racemose. Fl. yellow, Sep to Nov. White, grey or yellow sand over laterite. Breakaways and hillslopes.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Stylidium</i> sp. Three Springs (J.A. Wege & C. Wilkins JAW 600)	P2		Occurs in yellow-brown clayey sand over laterite, yellow-brown clayey loam over granite, ironstone breakaway, loamy soils over granite, clay loams with scattered gravel, rocky hill with lateritic stones.		Unlikely Habitat not present and no records within the vicinity (<9km)	Unlikely
<i>Stylidium torticarpum</i>	P3		Caespitose perennial, herb, 0.12-0.27 m high, Leaves tufted, broadly linear, (2-) 5-13 cm long, 0.6-1.5 mm wide, apex mucronate, margin hyaline and serrulate, glabrous. Scape glandular throughout. Inflorescence paniculate. Capsule twisted. Fl. pink, Sep to Nov. Sandy clay and clay loam over laterite. Adjacent to creeklines, depressions, and beneath breakaways. Heath or mallee shrubland.		Unlikely Habitat not present and no records within the vicinity (<9km)	Unlikely
<i>Synaphea oulopha</i>	P3		Compact shrub, ca 0.2 m high. Fl. yellow, Jul to Oct. Grey sand, gravelly loam, clay. Lateritic breakaways & rises.		Unlikely Habitat not present and no records within the vicinity (<9km)	Unlikely
<i>Synaphea sparsiflora</i>	P2		Shrub, to 0.6 m high, to 1 m wide. Fl. yellow, Aug to Sep. Sandy loam over laterite.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Tetrateca nephelioides</i>	EN	CR	Caespitose, dwarf shrub, to 0.3 m high. Fl. purple, Sep. White-grey sand, yellow-brown clayey sand, gravel, laterite. Outcrops, undulating hills, ridges,.	Species or species habitat may occur within area	Unlikely Habitat not present and no records within the vicinity (<9km)	Unlikely
<i>Thelymitra stellata</i>	EN	EN	A tuberous, perennial orchid from 150-250 mm high. Its yellow and brown flowers appear from October to November. Occurs on sand, gravel and lateritic loam.	Species or species habitat likely to occur within area	Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely

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	BC Act	EPBC Act				
<i>Thryptomene</i> sp. Lancelin (M.E. Trudgen 14000)	P3		Shrub, ca 0.5 m high. Fl. pink, Sep. Calcareous sand.		Unlikely Habitat not present and no records within the vicinity (<9km)	Unlikely
<i>Thysanotus glaucus</i>	P4		Caespitose, glaucous perennial, herb, 0.1-0.2 m high. Fl. purple, Oct to Dec or Jan to Mar. White, grey or yellow sand, sandy gravel.		Likely Habitat present and existing close records	Possible
<i>Tricoryne</i> sp. Wongan Hills (B.H. Smith 794)	P2		Multi-stemmed, open, caespitose rhizomatous, perennial, herb, to 0.2 m high. Yellow to grey sand, gravelly clay quartz, laterite, limestone. Midslopes and uplands.		Unlikely Habitat present but no records within the vicinity (<9km)	Recorded
<i>Triglochin protuberans</i>	P3		Annual, herb, 0.03-0.13 m high. Red loam, grey mud over clay. Winter-wet sites, claypans, near salt lakes, margins of pools.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Verticordia argentea</i>	P2		Erect, open shrub, 0.9-2 m high. Fl. pink & white, Nov to Dec or Jan to Apr. White, grey or yellow sand. Sand ridges, undulating plains.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Verticordia dasystylis</i> subsp. <i>oestopoa</i>	P1		Spreading shrub, 0.1-0.4 m high. Fl. cream-yellow, Oct. Gritty soils over granite. Outcrops.		Unlikely Habitat not present and no records within the vicinity (<9km)	Unlikely
<i>Verticordia fragrans</i>	P3		Openly branched shrub, 1-3 m high. Fl. pink-white, Sep to Nov. White, grey or yellow sand, clay loam. Low-lying areas, sandplains.		Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely
<i>Verticordia luteola</i> var. <i>luteola</i>	P3		Slender shrub, 0.5-1.4 m high. Fl. white-yellow, Nov to Dec. Grey sand over gravel. Flats.		Likely Habitat present and existing close records	Unlikely
<i>Wurmbea tubulosa</i>	VU	EN	Cormous, perennial, herb, 0.01-0.03 m high, dioecious or sometimes andromonoecious. Fl. white-pink, Jun to Aug. Clay, loam. River banks, seasonally-wet places.	Species or species habitat may occur within area	Unlikely Habitat present but no records within the vicinity (<9km)	Unlikely

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