INTERIM FLORA & VEGETATION ASSESSMENT

CARAVEL COPPER PROJECT

Mine Expansion Areas and Koodjee Reserve

Prepared By

Mattiske Consulting Pty Ltd

Prepared For

Caravel Mining Limited

Date

March 2022

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Mattiske Consulting Pty Ltd

(ACN 063 507 175, ABN 39 063 507 175)

PO Box 437

Kalamunda WA 6926

Phone: +61 8 9257 1625

Email: admin@mattiske.com.au

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LIST OF ABBREVIATIONS

BAM Act:	*Biosecurity and Agriculture Management Act 2007* (WA)
BC Act:	*Biodiversity Conservation Act 2016* (WA)
BOM:	Bureau of Meteorology
Caravel	Caravel Mining Limited
DAWE	Department of Agriculture, Water and the Environment
DBCA	Department of Biodiversity, Conservations and Attractions
DPIRD	Department of Primary Industries and Regional Development
EP Act:	*Environmental Protection Act 1986* (WA)
EPA:	Environmental Protection Authority
EPBC Act:	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
ESCAVI	Executive Steering Committee for Australian Vegetation Information
IBRA:	Interim Biogeographical Regionalisation for Australia
IBSA	Index of Biodiversity Surveys for Assessment
Mattiske Consulting	Mattiske Consulting Pty Ltd
NVIS	National Vegetation Information System
PEC:	Priority ecological community
TEC:	Threatened ecological community
WAH:	Western Australian Herbarium (PERTH)
WAOL:	Western Australian Organism List

EXECUTIVE SUMMARY

Mattiske Consulting Pty Ltd (Mattiske Consulting) was engaged in 2018 and 2021 by Caravel to undertake a desktop assessment and flora and vegetation survey work associated with the Caravel Copper Project. In 2018 the project area comprised the Mine site and Pipeline Alignment areas. The 2021 survey encompassed an expanded Mine site survey area, the Pipeline Alignment, together with a potential Paleochannel and Borefield survey areas, and a potential access route via Konnongorring Rd West. This interim report includes preliminary mapping of the Mine site area and Koodjee Nature Reserve inside the potential Borefield area. A separate report (Mattiske Consulting 2022) addresses the TEC assessment survey work which was undertaken concurrently with the flora and vegetation survey work.

Flora and vegetation assessments of the Mine site survey area and pipeline survey area was undertaken by 5 botanists from Mattiske Consulting between the 7th and 9th of November 2018. A further flora and vegetation assessment of the Mine site survey area was undertaken by 5 botanists from the 7th to 9th and 4 botanists from the 28th – 31st of September 2021. A flora and vegetation assessment of the Koodjee Nature Reserve within the potential borefield survey area was undertaken by 4 botanists on the 1st of October and by 2 botanists on the 21st and 22nd of October 2021. The botanists all held valid collection licenses to collect flora for scientific purposes, issued under Regulation 62 of the *Biodiversity Conservation Regulations 2018*. The vegetation surveys were completed to the standards set out in *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a) and Environmental Factor Guideline: Flora and Vegetation (EPA 2016b). Additionally, one botanist held a valid permit to take Declared Rare Flora, issued under Section 40 of the *BC Act*.

Across the Caravel Copper Project a total of 92 quadrats were selected in which flora and vegetation was described and sampled systematically. Within the Mine site area, a total of 376 vascular plant taxa, representative of 168 genera and 59 families, were recorded. The majority of taxa recorded were representative of the Myrtaceae (59 taxa), Asteraceae (44 taxa) and Poaceae (38 taxa) families. Within the Koodjee nature reserve A total of 266 vascular plant taxa, representative of 148 genera and 53 families, were recorded. The majority of taxa recorded were representative of the Myrtaceae (28 taxa), Poaceae (28 taxa), and Asteraceae (23 taxa) families.

One species of threatened flora taxa, pursuant to Part 2, Division 1, Subdivision 2 of the *BC Act 2016*, and pursuant to section 179 of the *EPBC Act 1999,* was recorded within the survey area. *Banksia serratuloides* subsp. *serratuloides* (T) was recorded within the Koodjee Nature Reserve within two quadrats. The current records constitute a range extension for this species.

Six priority flora taxa, as listed by the WAH (1998-), were recorded within the survey area. This included two from the Mine site area, four from the Koodjee Nature reserve and three from the Pipeline area through opportunistic collection. Records from within the Caravel Copper project area constitute a range extension for *Eucalyptus arachnaea* subsp*. arrecta* (P3) and *Petrophile plumosa* (P3).

One declared pest organism pursuant to section 22 of the *BAM Act* was recorded within the project area. *Moraea flaccida* was recorded within the Mine site area and was also recorded opportunistically within the pipeline area. Within the Mine site area, a total of 50 introduced species were recorded. Within the Koodjee Nature Reserve a total of 44 introduced species were recorded.

Within the Carvel Copper Project area two potential protected or threatened ecological communities were identified. The Eucalypt Woodlands of the Western Australian Wheatbelt is listed as a PEC, pursuant to subsection (1) section 27 of the *BC Act 2016* and is categorised as a Critically Endangered TEC under the *EPBC Act 1999*. The Banksia Woodlands of the Swan Coastal Plain ecological community is listed as a PEC, pursuant to subsection (1) section 27 of the *BC Act 2016* and is categorised as an Endangered TEC under the *EPBC Act 1999*. The extent and overall condition of these ecological communities is discussed further in the adjoining report - Interim TEC report for the Caravel Copper Project (Mattiske 2022).

The vegetation of the Mine site area ranged from degraded to pristine. Large areas of crop farmland were considered to be completely degraded including areas adjacent to the road alongside the proposed pipeline route. Most of the larger remnant vegetation patches (those greater than 2 ha) had a condition rating of degraded to pristine, with the majority rated as very good.

Within the Mine site area 23 vegetation communities were delineated and mapped across the Caravel Copper project area. The vegetation communities present occurred on a range of different associated soils and landforms. The woodland proportion of the surveyed area is dominated by *Allocasuarina campestris* open woodlands over *Acacia acuminata* open shrublands over mixed forblands on red to brown sandy clay loam soils on flats, or alternatively, by eucalypt woodland communities on brown sandy-clay loam soils, occasionally associated with granite outcrops and laterite. These Eucalypt woodland communities include; Open forests of *Eucalyptus loxophleba* over *Acacia acuminata* over mixed weedy grasslands, open woodlands of *Eucalyptus wandoo* over *Acacia brumalis* and *Banksia hewardiana* sparse shrublands and open woodlands of *Eucalyptus salmonophloia* over *Melaleuca marginata* over sparse chenopod shrublands. These communities are interspersed with *Casuarina obesa* open woodlands over Proteaceae, Chenopodiaceae, or Myrtaceae variable mixed understories, often occurring on dark sandy-loam soils.

The majority of the northern proportion of the Mine site area is dominated by shrubland communities consisting of isolated *Eucalyptus loxophleba* trees over mixed sparse Myrtaceae and Proteaceae shrubs over mixed *Tecticornia* spp. samphire shrublands situated on salt flats with white clay pan and brown sand. This dominant shrubland community is interspersed with multiple other shrubland communities often dominated by either Proteaceae, Chenopodiaceae, or Myrtaceae species over mixed grasslands, generally occurring on brown sandy-clay loam soils on flats or around wetlands.

Within the Koodjee Nature Reserve seven vegetation communities were delineated and mapped across the Caravel Copper project area. The western side of the Koodjee Nature Reserve is dominated by a Banksia woodland vegetation community consisting of an open woodland of *Banksia attenuata and Banksia prionotes* over a sparse shrubland of *Allocasuarina humilis, Melaleuca seriata* and *Conospermum stoechadis* subsp*. stoechadis* over a sparse rushland of *Alexgeorgea nitens, Mesomelaena pseudostygia* and *Amphipogon turbinatus* situated on cream or white sands on flats and slopes. The Banksia woodland community recorded a condition rating of excellent and meets the criteria to be categorised as part of the "Banksia Woodlands of the Swan Coastal Plain" threatened ecological community (see Mattiske Consulting 2022).

Woodland areas within the Koodjee Nature Reserve ran along either side of the Moore River and consisted of open woodlands of *Eucalyptus wandoo* over mixed grasslands on orange brown clay loam to clayey sand soils on floodplains or closed shrublands on orange brown clay loam on flats and slopes. The areas directly either side of the Moore River within the Koodjee Nature reserve recorded a condition rating of degraded, this area showed evidence of significant disturbance and a high proportion of introduced species. Further from the banks of the river the vegetation was recorded as good with a lower level of disturbance but still supporting introduced species.

The eastern side of the Koodjee Nature Reserve was dominated by drier, highly diverse shrublands, including; open shrublands of *Allocasuarina campestris, Calothamnus quadrifidus* subsp*. quadrifidus* and *Acacia blakelyi* over low shrublands of *Lepidobolus preissianus, Melaleuca seriata, Acacia ericifolia* over a sparse grassland of *Triodia danthonioides* on brown sandy loam on flats; sparse shrublands of *Allocasuarina campestris* tall over open shrublands of *Calothamnus pachystachyus* (P4)*, Banksia sclerophylla, Banksia serratuloides* subsp*. serratuloides* (T) over low sparse shrubland of *Hibbertia acerosa, Conostylis androstemma, Ericomyrtus serpyllifolia* on gravelly orange to light brown clayey loam soils on flats; and sparse shrublands of *Melaleuca concreta* over *sparse shrubland of Acacia lasiocarpa* over *Borya sphaerocephala* sparse forbland on grey to light brown clayey loam soils on flats. These shrublands consisted of a high proportion of conservation significant flora and were all in either an excellent or pristine condition with little disturbance or introduced weed species.

1. INTRODUCTION

Caravel Minerals Limited (Caravel) is investigating the feasibility of developing the Caravel Copper Project west of Wongan Hills, Western Australia. Mattiske Consulting Pty Ltd (Mattiske Consulting) was engaged in 2018 to undertake an initial reconnaissance survey of remnant vegetation within the Caravel Copper Project area and the proposed Pipeline Alignment from the Moore River East near New Norcia to the Project area, with emphasis on identifying conservation significant species, identifying Threatened Ecological Communities (TECs) and defining and mapping the vegetation communities present.

Subsequent to the initial survey in 2018, Mattiske Consulting was engaged in August 2021 by Caravel to undertake a desktop assessment and further flora and vegetation survey work associated with the Caravel Copper Project. In 2018 the Project area comprised the Mine site and Pipeline Alignment areas. The 2021 survey encompassed an expanded Mine site survey area, the Pipeline Alignment, together with a potential Paleochannel and Borefield survey areas, and a potential access route via Konnongorring Rd West.

This interim report includes preliminary mapping of the Mine site area and Koodjee Nature Reserve inside the potential Borefield area. A separate report (Mattiske Consulting 2022) addresses the TEC assessment survey work which was undertaken concurrently with the flora and vegetation survey work.

1.1 Location and Scope of Project

The Caravel Copper Project is located approximately 120 km north east of Perth, between the towns of Calingiri and Wongan Hills, in Western Australia's Wheatbelt Region (Figure 1). The infrastructure associated with the project runs between Wongan Hills and Gillingarra. The survey area included in this report includes the proposed mine survey area and Koodjee Nature Reserve near the potential Borefield survey area.

The Mine site survey area intersects with two Mining leases (M 70/1410, M 70/1411) and 5 Exploration licences (E 70/2788, E 70/3674, E 70/5228, E 70/5442, E 70/5379), approximately 10 km south-west of the town of Wongan Hills (Figure 1). Lake Ninan Nature Reserve (R-27025, 259 ha, gazetted as an A-Class reserve for recreation) is located directly north of the Mine site area (Figure 2). Compared to the conceptual Mine site area surveyed in 2018, when the Project area comprised a Mine site and Pipeline Alignment areas, the present Mine site area has been expanded from 5,869 ha (in 2018) to approximately 8,085 ha. This represents a 38% increase in the Mine site area, principally in a western and northern direction, on the northern side of the Wongan Hills Calingiri Rd. The Mine site survey area is mostly agricultural land used for crop production with the majority of the remnant vegetation either located around low-lying salt affected lands or planted tree stands (windbreaks).

The potential Borefield survey area is bounded by Boxhall Road to the north by, Kelly Road to the west, Gillingarra Road to the South and the Bindoon-Moora Road to the East and includes the Koodjee Nature Reserve. Koodjee Nature Reserve is 5 km north of Gillingarra, Western Australia in the Shire of Victoria Plains. The Koodjee Nature Reserve (R 20738, 127 ha, gazette as an A-Class reserve for the conservation of flora and fauna) is situated on the western portion of the potential Borefield area (Figure 2). The Moore River traverses the western portion of the potential Borefield area, in a north-south direction. The potential Borefields area, and in particular the Koodjee Nature Reserve, are situated in an area of potential indirect impacts from water abstraction in the Paleochannel area.

1.2 Environmental Legislation and Guidelines

The following key Commonwealth (federal) legislation relevant to this survey is the:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

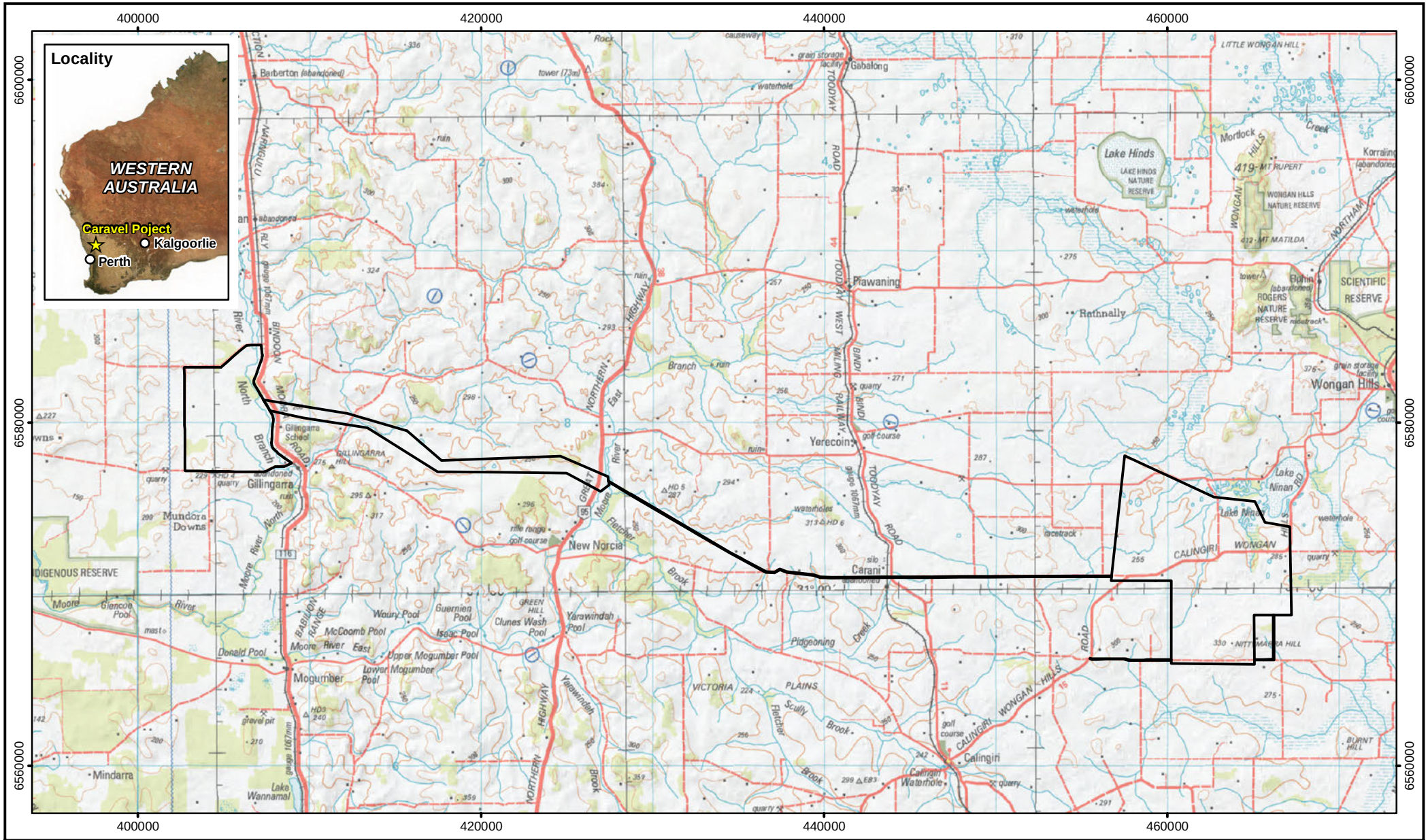
The following key Western Australian (state) legislation relevant to this survey include the:

- *Biodiversity Conservation Act 2016* (BC Act);
- *Biosecurity and Agriculture Management Act 2007* (BAM Act);
- *Environmental Protection Act 1986* (EP Act); and
- *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*

Furthermore, key Western Australian guidelines relevant to this survey are the:

- *Technical Guidance – Flora and vegetation surveys for environmental impact assessment* ((Environmental Protection Authority [EPA] 2016a); and
- *Environmental Factor Guideline: Flora and Vegetation* (EPA 2016b)

Definitions of flora and vegetation terminology commonly used throughout this report are set out in Appendices A1 – A6.



Legend

Proposed Survey Areas

Client: CARAVEL MINERALS

N

0 4 8km

Scale: 1:300,000
MGA94 (Zone 50)

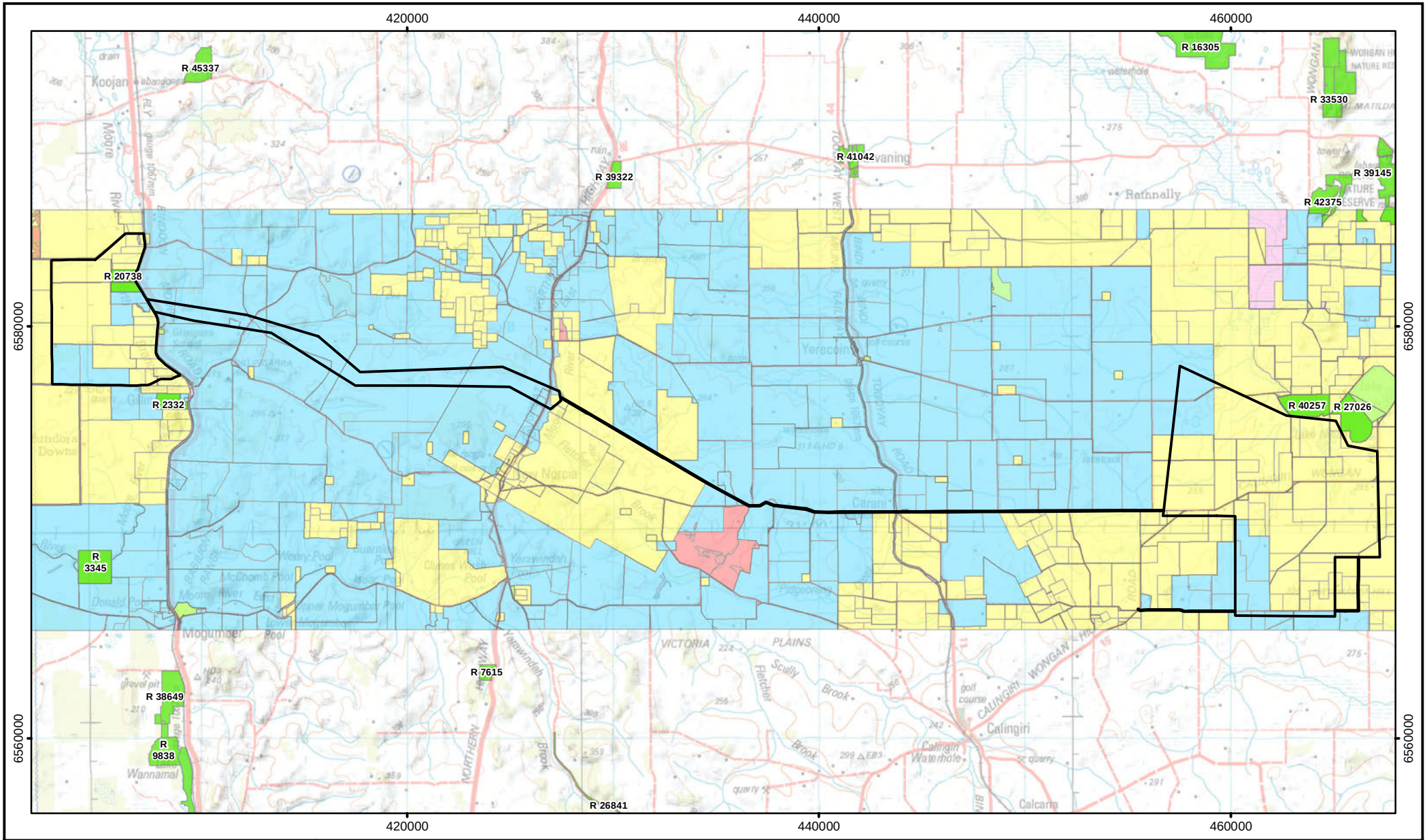
CAD Ref: a2668_f04_03

Date: July 2021 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref:
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Caravel Copper Project
Locality

Figure: 1



Legend

- Proposed Survey Areas
- DBCA Nature Reserve
- **Cadastre Type**
- Crown
- Easement
- Freehold
- Other
- Reserve
- Road

Client: CARAVEL MINERALS

N

0 3 6km

Scale: 1:250,000
MGA94 (Zone 50)

CAD Ref: a2668_f04_06

Date: July 2021 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref:
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Caravel Copper Project
Land Tenure

Figure: **2**

2. OBJECTIVES

The aim of this survey was to complete a flora and vegetation assessment of the Caravel Copper Project area to support an application to clear native vegetation under part 4 of the *EP Act*, as part of a mining proposal. Specifically, the objectives included:

- Undertake a desktop assessment to evaluate the botanical values of the local and broader area associated with the Caravel Copper Project to identify any matters of botanical or conservation significance;
- Review the conservation status of the vascular plant species recorded by reference to current literature and current listings by the DBCA (Western Australian State Herbarium [WAH] 1998-) and plant collections held at the WAH, and listed by the Department of Agriculture, Water and the Environment (DAWE 2022b) under the *Environment Protection and Biodiversity Conservation Act* 1999;
- Review historical literature and current databases associated with the survey area;
- On the basis of the reviews, provide summaries to assist in the assessment of the potential range of values and the potential for conservation significant species and communities;
- Collect and identify the vascular plant species present in representative vegetation survey quadrats, as well as opportunistically, within the survey area;
- Record visual observations of the fire regimes, grazing pressures and overall health of the vegetation to allow for an assessment of the overall condition of the remnant flora and vegetation within the Caravel Copper Project area;
- Combine new vegetation survey data with that from Mattiske Consulting (2018) to create a vegetation map of the survey areas;
- Define and map the location of any threatened and priority flora located within the Caravel Copper Project area;
- Define any management issues related to flora and vegetation values;
- Provide recommendations on the local and regional significance of the vegetation communities; and
- Prepare a report summarising the findings.

3. METHODS

3.1 Desktop Survey

The Desktop survey includes four distinct areas of the Caravel Copper Project. The Mine site survey area is located approximately 10 km south-west of the town of Wongan Hills. The pipeline runs from the south eastern edge of the Mine site survey area to Moore River East, north of New Norcia. The Paleo-channel survey area runs from Moore River East, north of New Norcia to Moore River North between Moora and Gillingarra. The potential Borefield survey area is bounded by Boxhall Road to the north, by Kelly Road to the west, Gillingarra Road to the South and the Bindoon-Moora Road to the East. Vertices of survey perimeters are presented for the four survey areas in Appendix I.

A desktop assessment was conducted using FloraBase (WAH 1998-), NatureMap (Department of Parks and Wildlife 2007-) and the EPBC Act *Protected Matters Search Tool* (DAWE 2022b) databases, to identify the possible occurrence of threatened and priority flora and threatened and priority ecological communities within the Caravel Copper Project Mine site survey area and each proposed infrastructure area.

A NatureMap search was conducted for the Caravel Copper Project on July 6th 2021. Search parameters were 'by circle' for the Mine site survey area, the Paleochannel survey area and the potential borefield survey area and 'by line' for the Pipeline survey area and encompassed the Tenement using the following parameters:

- Mine Site Survey Area: 116° 38′ 03″ E - 30° 59′ 40″ S (15 km radius)
- Pipeline Survey Area:
  - -East Point: 116° 32′ 48″ E - 30° 59' 35″ S (5 km buffer)
  - -Centre Point 116° 20′ 28″ E - 30° 59' 24″ S (5 km buffer)
  - -West Point 116° 14′ 25″ E - 30° 56' 31″ S (5 km buffer)
- Paleochannel Survey Area: 116° 04′ 47″ E - 30° 55′ 38 S (10 km radius)
- Potential Borefield Survey Area: 116° 01′ 25″ E - 30° 52′ 18″ S (15 km radius)

A shape-file with the aforementioned vertices (Appendix I) with a 5 km buffer was used in the *EPBC Act* Protected Matters Search Tool (DAWE 2022b).

3.2 Field Survey

Flora and vegetation assessments of the Mine site survey area and pipeline survey area was undertaken by 5 botanists from Mattiske Consulting between the 7th and 9th of November 2018. A further flora and vegetation assessment of the Mine site survey area was undertaken by 5 botanists from the 7th to 9th and 4 botanists from the 28th – 31st of September 2021. A flora and vegetation assessment of the Koodjee Nature Reserve within the potential borefield survey area was undertaken by 4 botanists on the 1st of October and by 2 botanists on the 21st and 22nd of October 2021. The botanists all held valid collection licenses to collect flora for scientific purposes, issued under Regulation 62 of the *Biodiversity Conservation Regulations 2018*. The vegetation surveys were completed to the standards set out in *Technical Guidance – Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA 2016a) and Environmental Factor Guideline: Flora and Vegetation (EPA 2016b). Additionally, one botanist held a valid permit to take Declared Rare Flora, issued under Section 40 of the *BC Act*.

The geographic co-ordinates defining the survey areas were supplied by Caravel Minerals Ltd. High resolution aerial photographic maps of the Mine site survey area and Koodjee Nature Reserve were supplied by Caravel Minerals Ltd and prepared by CAD Resources. Vegetation quadrats for the survey areas were selected using aerial photographic maps and field observations. A total of 76 vegetation quadrats were recorded to sample all apparent vegetation types, with replication, within the Mine site survey area. Thirty-three vegetation quadrats were assessed in 2018 and 43 were assessed in 2021. A total of 16 vegetation quadrats were assessed within Koodjee Nature Reserve in 2021. The location of all survey quadrats established within the Mine site survey area and Koodjee Nature Reserve are set out in Appendix C1 and C2.

Vegetation quadrats consisted of unmarked 20 m x 20 meter quadrats in the Mine site survey area (Wheatbelt) and 10 x 10 m quadrats in Koodjee Nature Reserve (Swan Coastal Plain). In situations where vegetation community shape (e.g., drainage channels) precluded establishing quadrats of the standard dimension, an area of equivalent size (i.e., 400 m^2) was surveyed. The flora and vegetation were sampled and described systematically at each vegetation survey quadrat, and additional opportunistic collecting was undertaken wherever previously unrecorded plants were observed. At each vegetation survey quadrat, the following floristic and environmental parameters were recorded:

- GPS location (GDA94 datum);
- photograph of the vegetation from the north-west corner of quadrat facing south-east;
- soil type, colour and any additional observations;
- local site topography;
- presence of any outcropping rocks and their type;
- aspect of the hill-slopes;
- percentage of litter cover (logs, twigs and/or leaves);
- percentage of bare ground;
- time since fire;
- condition of the vegetation, (based on Keighery 1994); and
- alive and dead percentage of foliage cover and average height of each species recorded.

All plant specimens collected during the field survey were dried and processed in accordance with the requirements of the WAH. All plant specimens were identified through comparisons with pressed specimens housed at the Mattiske Consulting herbarium and WAH. Where appropriate, plant taxonomists with specialist skills were consulted. Nomenclature of the species recorded is in accordance with the WAH (1998-).

3.3 Statistical Analysis of Data and Vegetation Mapping

A species accumulation curve, based on accumulated species versus number of quadrats surveyed was prepared, to evaluate the level of adequacy of the survey effort. The species accumulation curve was based on the species accumulation analysis of Colwell (2013).

Plymouth Routines in Multivariate Ecological Research version 7 (PRIMER v7) statistical analysis software was used to analyse species-by-site data and discriminate sites on the basis of their species composition (Clarke and Gorley 2015). Introduced species, singletons (species recorded at only one site) and specimens that were not identified down to the species level were excluded from the analysis (unless considered a dominant component of that quadrat). Annuals were removed from the data in analysis due to the likelihood of substantial differences between years based on seasonality of local rainfall events. A large portion of the survey quadrats sampled were in a degraded condition, with highly variable understorey species. A log-10 transformation was applied to the data set in order to reduce excessive weighting being allocated to understorey species. Computation of similarity matrices was based on the Bray-Curtis similarity measure. Transformed data were analysed using a series of multivariate analysis routines including Hierarchical Clustering (CLUSTER), Similarity Profile (SIMPROF), Similarity Percentages (SIMPER), and Analysis of Similarity (ANOSIM). Results were used to inform and support interpretation of aerial photography and delineation of individual vegetation communities.

3.4 Vegetation descriptions

Vegetation descriptions were based on Aplin's (1979) modification of the vegetation classification system of Specht (1970), to align with the National Vegetation Information System (NVIS) (see Appendix A). Vegetation communities were described at the association level of the National Vegetation Information System (NVIS) classification framework, as defined by the Executive Steering Committee for Australian Vegetation Information (ESCAVI 2003).

3.5 Field Survey Coverage & Limitations

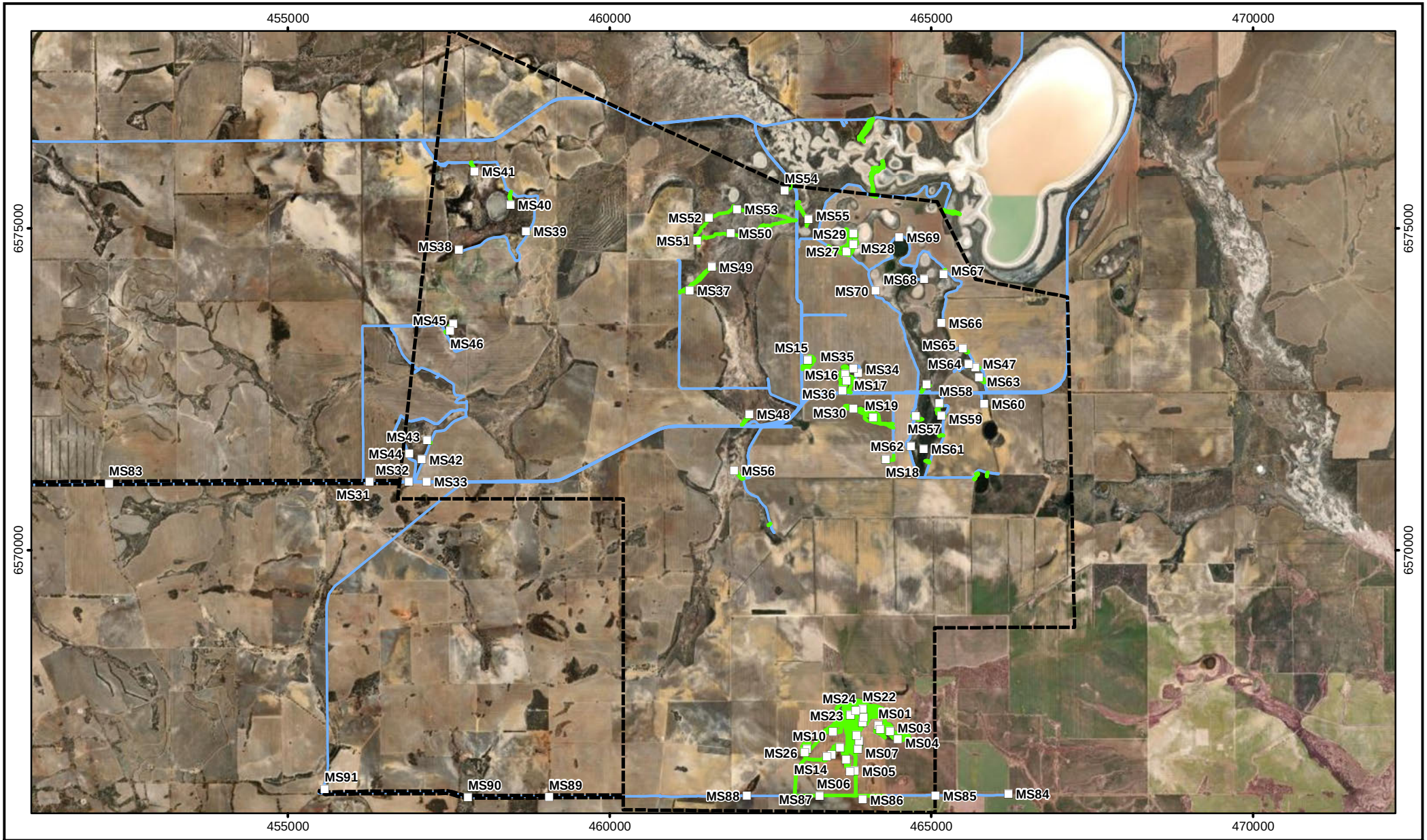
The coverage of the survey area, based on survey quadrat locations, driven tracks and foot traverses, is illustrated in Figure 3.1 & 3.2. A general assessment was made of the current survey against a range of factors that may have limited the outcomes and conclusions of this report (Table 1). Based on this assessment, the present survey has not been subject to constraints which would affect the thoroughness of the survey, and the conclusions which have been formed.

Table 1: Potential flora and vegetation survey limitations for the Caravel Copper Project survey area

POTENTIAL SURVEY LIMITATION	IMPACT ON SURVEY
Sources of information and availability of contextual information (i.e., pre-existing background versus new material).	Not a limitation. Reference resources such as Beard's mapping (1981 & 2013), historical survey data in in the broader region, together with online flora and vegetation information, has provided an appropriate level of information for the survey. Vegetation and targeted flora survey reports associated with the Wongan Hills area (Coates 1988) were also reviewed to provide more localised contextual information.
Scope (i.e., what life forms, etc., were sampled).	Not a limitation. Vascular flora, which was the focus of the present survey, was sampled.

Table 1: Potential flora and vegetation survey limitations for the Caravel Copper Project survey area

POTENTIAL SURVEY LIMITATION	IMPACT ON SURVEY
Completeness and further work which might be needed (i.e., was the survey area fully surveyed).	Potential limitation. The scope of this survey was to undertake a detailed vegetation survey of selected areas of the Mine site survey area and the potential Borefield survey area. Which together covered approximately 11,000 ha in size. Within the Mine site survey area all target areas were surveyed with the exception of an area in the southwest, this was due to permission restrictions and will need to be revisited to complete the survey area vegetation mapping. Within the potential Borefield survey area, the Koodjee Nature Reserve was the focus for this vegetation survey as it was considered to have both high conservation significance and higher risk of potential impact. Within the Nature Reserve the focus areas were those with the potential to be affected by drawdown (potential GDE areas along the river) as well as the Banksia Woodland PEC in the west of the nature reserve. An area to the south of the nature reserve was not mapped during this survey. Additional surveys will be required to map the vegetation of the lower priority areas within the potential borefield survey area.
Proportion of flora collected and identified (based on sampling, timing and intensity).	Potential limitation: While many plants were in flower during the survey, a proportion of plants encountered during the survey were sterile and may impact the chance of identification of some specimens to species level. Orchid species may not emerge each year if conditions are not favourable.
Survey timing, weather, season, cycle.	Not a limitation. The EPA (2016a) recommends that flora and vegetation surveys in the Southwest and Interzone botanical provinces take place primarily in the spring (September – November), with supplementary surveys after autumn rainfall. Rainfall in the month preceding the November 2018 survey was above the long-term average for the corresponding period. Rainfall in August and September 2021 (the months preceding the 2021 surveys) was below the long-term average for the corresponding period. From a seasonal perspective, the majority of all flora present were fertile during the survey.
Disturbances (fire, flood, accidental human intervention, etc.).	Not a limitation: The Avon Wheatbelt has been extensively cleared for agricultural purposes, up to 30 % of the landscape is threatened by rising saline groundwater (Williams & Mitchell 2001). The high-resolution aerial maps used to select quadrat areas were able to clearly show disturbed areas prior to the survey. Quadrat selection was not limited by lack of information.
Data and statistical analysis.	Not a limitation: Measures were taken to improve the robustness of data and analysis (see methods section). However, due to the degraded nature of the project area and often lack of understorey, it was necessary to increase the weighting given to dominant indicator species to assist in defining communities.
Access problems (i.e., ability to access the survey area).0	Not a limitation. Project areas had access tracks, providing adequate access to undertake surveys by foot. Some areas were not available for assessment as landholders withheld permission for access. In addition the area between the western section of the pipeline and the western section supporting the potential borefield were not assessed due to lack of permissions to access the areas and some uncertainty on detail of proposed facilities near the potential borefield.
Experience levels (e.g., degree of expertise in plant identification to taxon level).	Not a limitation: An experienced team of botanists carried out the survey.



Legend

- Quadrats
- Survey Areas
- Foot Tracks
- Drive Tracks

Imagery: ESRI, Maxar (Feb 2021)

Client: CARAVEL MINERALS

N

0 1 2km

Scale: 1:80,000
MGA94 (Zone 50)

CAD Ref: a2668_f09_02

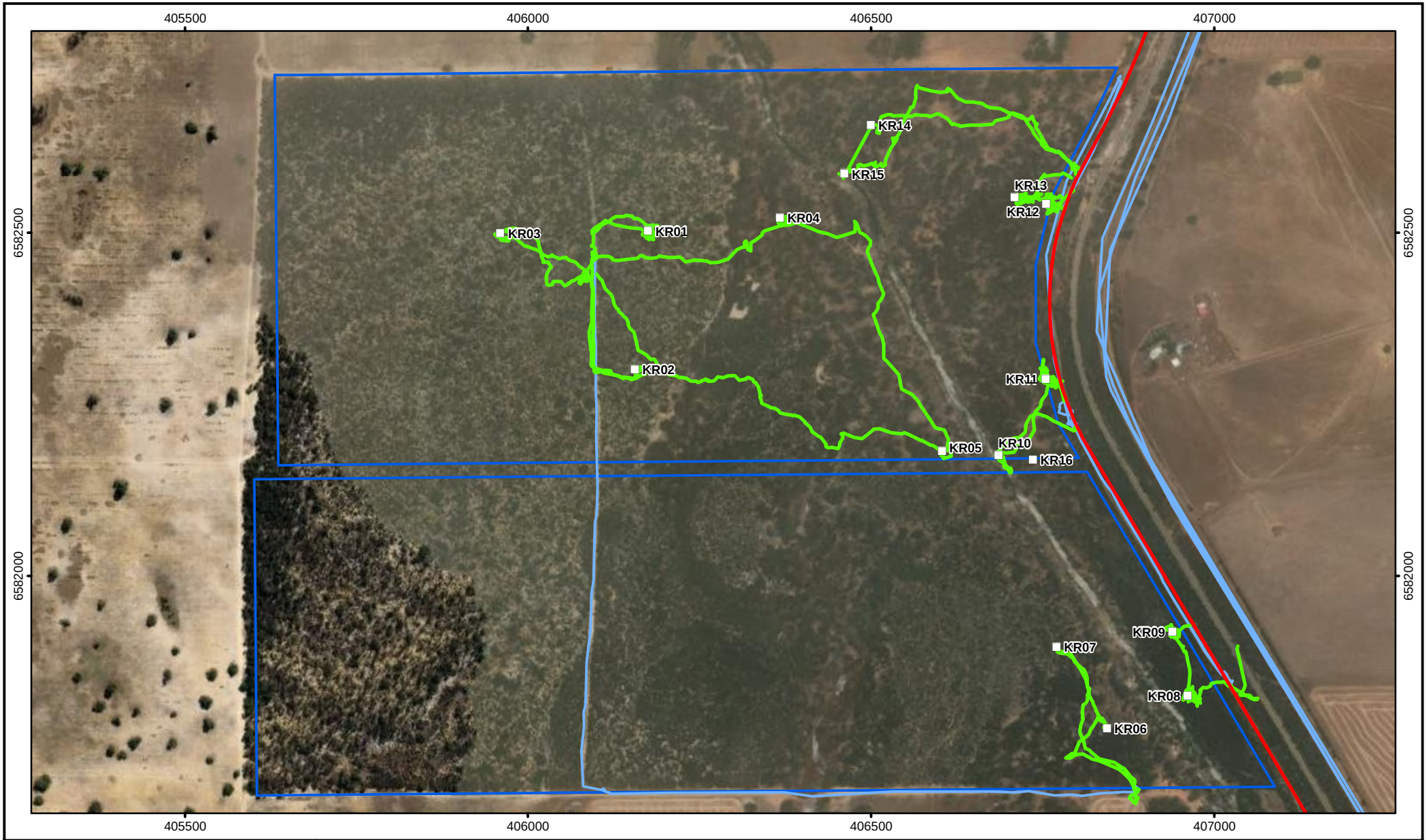
Date: March 2022 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref:
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Caravel Copper Project

Quadrats/Tracks and Foot Traverses

Figure: **3.1**



Legend
- Quadrats
- Survey Area
- Koodjee Nature Reserve
- Foot Tracks
- Drive Tracks

Imagery: ESRI, Maxar (Feb 2021)

Client: CARAVEL MINERALS

N

0 75 150 m
Scale: 1:7,500
MGA94 (Zone 50)

CAD Ref: a2668_f09_03
Date: March 2022 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref:
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Caravel Copper Project
Quadrats/Tracks and Foot Traverses

Figure: **3.2**

4. DESKTOP SURVEY RESULTS

4.1 Climate

Beecham (2001) described the climate of the wider region in which the Caravel Copper Project is situated as semi-arid (dry) warm Mediterranean, consistent with descriptions of a characteristically arid to semi-arid climate with 300-650 mm of precipitation (Beard 1990). The nearest Bureau of Meteorology (BOM) station to the Caravel Copper project is at Wongan Hills, located approximately 11 km north-east of the survey area. Rainfall and temperature data for Wongan Hills station (008137, BOM 2022) is illustrated in Figure 4. The rainfall and temperature data displayed spans the period January 2018 to December 2021. Rainfall in the four months preceding the September 2021 survey was 232 mm, which is approximately 96% of the long-term average for the corresponding period.

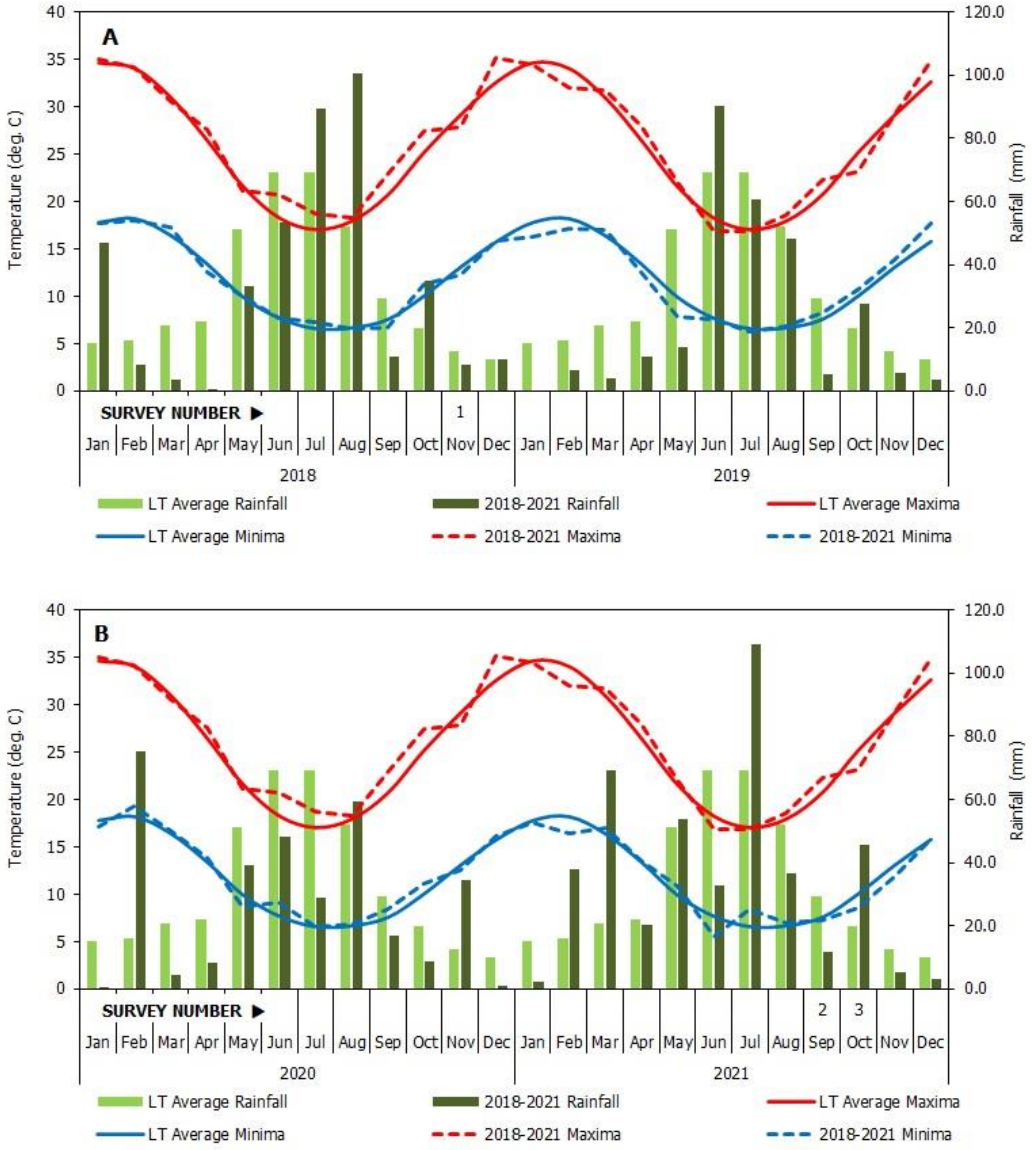


Figure 4: Rainfall and temperature data for Wongan Hills (BOM Station 012320)

Long term average rainfall and temperature data, together with monthly rainfall data for the period January 2018 to December 2021 (BOM 2022).

4.2 Managed Lands

There are a number of Nature Reserves in the area surrounding the Caravel Copper Project, presented in Figure 2. Lake Ninan Nature Reserve (R-27025, 259 ha, gazetted as an A-Class reserve for recreation) is located directly north of the Mine site area. Also directly north of the Mine site survey area and adjacent to the Lake Ninan Reserve is unnamed Reserve 40257. The entire Koodjee Nature Reserve (R 20738) is located within the potential Borefields survey area. Gillingarra Nature Reserve (R 2332) is located to the south of the potential Borefields survey area (Figure 2).

4.3 Geology, Soils and Topography

The Mine site survey area lies within the Avon Botanical District of the Wheatbelt Region (Beard 1990). The potential Borefield survey area and Koodjee Nature reserve lie within the Dale Botanical Subdistrict and the Drummond Botanical Subdistrict in the Southwest Forest Region (Beard 1990). More recently, the vegetation of Western Australia has been assigned to bioregions and subregions under the Interim Biogeographical Regionalisation for Australia (IBRA). The Mine site survey is within the Avon Wheatbelt 2 (AVW02 – Katanning) subregion of the Avon Wheatbelt Bioregion (Beecham 2001). Koodjee Nature Reserve is within the Swan Coastal Plain 1 (SWA01 – Dandaragan Plateau) and Jarrah Forest 1 (JAF01 – Northern Jarrah Forest) in the Swan Coastal Plain and Jarrah Forest Bioregion (Desmond 2001, Williams and Mitchell 2001).

The Avon Wheatbelt 2 subregion is located within an area of active drainage, dissecting a Tertiary plateau in Yilgarn Craton. The landscape is gently undulating and of low relief. Soils within the project area consist of Aeolian soils and deep sands, lateritic uplands and derived sandplains, along with granite rock outcrops. Ancient drainage lines and salt lake chains on quaternary sands with hard setting, reddish brown soils on pan are also present within this IBRA subregion (Beecham 2001).

The Jarrrah Forest 1 subregion is located on a duricrusted plateau of the Yilgarn Craton characterised by forest on laterite gravels and, in the eastern part, by woodlands on clayey soils. Northern Jarrah Forest incorporates the area east of the Darling Scarp, overlying Archaean granite and metamorphic rocks of an average elevation of 300 m, capped by an extensive lateritic duricrust, dissected by later drainage and broken by occasional granite hills. In the east the laterite becomes deeply dissected until it compresses isolated remnants (Beecham 2001).

The Swan Coastal Plain 1 subregion plateau is bordered by Derby and Dandaragan Faults. Cretaceous marine sediments are mantled by sands and laterites. The subregion is characterised by woodlands and scrub-heaths on laterite pavement and on gravelly sandplains (Beecham 2001).

The Department of Primary Industries and Regional Development's Land Systems present within the Caravel Copper survey area (Figure 5, Table 2) includes:

Capitella 1 dune remnant Phase (222Cp): Hillcrests and very gently inclined upper hillslopes; sandy gravels, gravely pale deep sand; gravel more prominent than Cp1a, dunes have traversed much of unit.

Ewarts 3 Phase (256Mb): Gradual rises with numerous shallow drainage lines. Shallow gravel, loamy gravel, deep sand, yellow to brown sandy earth, sandy & loamy duplex, pale to yellow shallow sand. Wandoo, *Melaleuca*, *Acacia* spp. some Jarrah & Yorkgum.

Glentrome 1 typical Phase (256Gt): Fans, very gently inclined hillslopes and foot slopes usually lower; loamy earths, sandy and loamy duplexes.

Glentrome 2 typical Phase (256Gt): Very gently to gently inclined generally upper to middle hillslopes; loamy gravel, shallow loams over rock, loamy and sandy duplexes, loamy earths, clays, some wet soil.

Glentrome 2 Subsystem (256Gt): Moderately stripped very gently to gently inclined hillslopes, generally slightly concave slopes; loamy earths, loamy duplexes, shallow loams, loamy gravel, some clays.

Goomalling Saline Drainage, Phase 2 (256Go): Ancient drainage lines and salt lake chains on Quaternary sand. In the hard setting, reddish brown soils on pan. Saltbush, and samphire.

Greenhills York 3 Phase (256Gh): Undulating rises to undulating low hills on Migmataitic rocky outcrops. Sandy earth, shallow and deep sandy duplex, shallow to deep loamy duplex, deep sandy gravel and, stony soil. York gum, wandoo, salmon gum, jam.

Julimar Leaver fan Phase (253Ju): Fans, very gently inclined hillslopes and foot slopes usually lower; loamy gravel, loamy earths, some loamy duplexes.

Ranfurly 1 Subsystem (256Ra): Alluvial plain of Moore River; loamy earths, clays and minor sandy earths.

Ranfurly 4 Subsystem (256Ra): Alluvial plain; loamy earth and saline.

Udamong 1 paleo-slope Phase (253Ug): broad U-shaped valley bottom. Yellow, pale and gravelly pale deep sands. Open woodland, *Banksia prionotes* and *Eucalyptus todtiana*.

Wannamal 4 Subsystem (253Wa): Alluvial plain; loamy earths, sandy and loamy duplexes.

Wongan Hills 1 Subsystem (256Wg): Gently to undulating rises. All slopes. on Aeolian soil. Mainly sandy earth and deep sands. *Acacia* spp. and *Melaleuca* spp.

Wongan Hills 2 Subsystem (256Wg): Gradual rise to undulating low hills. Mainly loamy gravel, deep sandy gravel and shallow gravel, minor of loamy earth and clay. Tammer, mallee, *Hakea*, *Grevillea* spp.

Yarawindah 1 Subsystem (253Yh): Fans, very gently inclined hillslopes and foot slopes usually lower; loamy gravel, loamy earths, some loamy duplexes.

Table 2: Extent of Land Systems intersecting Caravel Copper Project survey area

SURVEY AREA	LAND SYSTEM	MAPPING UNIT	AREA OF INTERSECTION WITH THE PROJECT AREA (ha)
Potential Borefield Survey Area	Capitella 1 dune remnant Phase	222Cp	2592.768
	Wannamal 4 Subsystem	253Wa	67.474
	Yarawindah 1 Subsystem	253Yh	20.093
	Glentrome 2 typical Phase	256Gt	0.810
	Ranfurly 1 Subsystem	256Ra	502.397
Mine Site Survey Area	Greenhills York 3 Phase	256Gh	831.789
	Goomalling Saline Drainage, Phase	256Go	1402.563
	Ewarts 3 Phase	256Mb	5475.861
	Wongan Hills 1 Subsystem	256Wg	375.021
Paleochannel Survey Area	Julimar Leaver fan Phase	253Ju	23.349
	Udamong 1 paleo-slope Phase	253Ug	1274.324
	Wannamal 4 Subsystem	253Wa	141.521
	Yarawindah 1 Subsystem	253Yh	95.703
	Glentrome 1 typical Phase	256Gt	54.313
	Ranfurly 4 Subsystem	256Ra	4.954
Pipeline Survey Area	Greenhills York 3 Phase	256Gh	36.784
	Glentrome 2 Subsystem	256Gt	21.279
	Ewarts 3 Phase	256Mb	72.620
	Ranfurly 4 Subsystem	256Ra	6.668
	Wongan Hills 2 Subsystem	256Wg	16.780

4.4 Regional Vegetation

The Caravel Copper project is situated within the Avon Botanical District, Dale Botanical Subdistrict and Drummond Botanical District. Beard (1990) described the vegetation of the Avon Botanical District as predominantly scrub-heath on sandplain, *Acacia-Casuarina* thickets on ironstone gravels, woodlands of York gum (*Eucalyptus loxophleba*), salmon gum (*Eucalyptus salmonophloia*) and wandoo (*Eucalyptus wandoo*) on loams and halophytes on saline soils. The vegetation of the Dale Botanical Subdistrict is Jarrah (*Eucalyptus marginata*) forest on ironstone gravels, marri-wandoo (*Corymbia calophylla – Eucalyptus wandoo*) woodlands on loamy soils, sclerophyll understoreys (Beard 1990). The vegetation of the Drummond Botanical District was described by Beard (1990) as mainly *Banksia* low woodland on leached sand with *Melaleuca* swamps where ill-drained; woodland of Tuart (*Eucalyptus gomphocephala*), Jarrah (*Eucalyptus marginata*) and Marri (*Corymbia calophylla*) on less leached soils.

The pre-European vegetation dataset, prepared through the National Land and Water Resources Audit, describes vegetation in relation to natural resource boundaries commonly used for environmental reporting (Shepherd *et al*. 2002). The pre-European vegetation dataset builds on the earlier vegetation studies by Beard (1981, 1990) vegetation maps. A vegetation system consists of a particular series of plant communities recurring in a catenary sequence or mosaic pattern linked to topographic, pedological and/or geological features. Beard (1981), in his 1:100,000 mapping series described the vegetation of the Victoria Plains System, the Koojan System, the Mogumber System and the Walebing System. The Pre-European vegetation systems present within the Caravel Copper Project (Figure 6, Table 3) include:

The Victoria Plains System: Thickets of *Allocasuarina*, woodlands of *Eucalyptus loxophleba* and *E. salmonophloia*, mosaics of woodland, teatree and samphire on salt flats. Other associated species include *Acacia acuminata, Banksia sessilis, Allocasuarina campestris, Allocasuarina huegeliana* and *Xanthorrhoea preissii.*

Vegetation Association 1024: Wattle, *Casuarina* and teatree *acacia-allocasuarina-melaleuca* alliance.
Vegetation Association 142.4: Wheatbelt; York gum, salmon gum etc. *Eucalyptus loxophleba, E. salmonophloia*. Goldfields; gimlet, redwood etc. *E. salubris, E. oleosa*. Riverine; rivergum *E. camaldulensis*.
Vegetation Association 694.0: Mixed heath with scattered tall shrubs *Acacia* spp., Proteaceae and Myrtaceae.
Vegetation Association 988.2: *Tecticornia* spp. with *Melaleuca* spp. *Acacia* spp.

The Koojan System: Heath improving to scrub-heath, or rarely to *Banksia* low woodland, in the valleys. In the heath *Banksia* spp. are dominant, *Xanthorrhoea* plants are present but small, trunkless, inconspicuous. In valleys *Hakea obliqua* is dominant in patches, or *Banksia burdettii* merging into tall *B. attenuate* and *B. menziesii.*

Vegetation Association 952.4: Low shrubs of mixed composition.
Vegetation Association 1030.2: Peppermint, cypress pine, *Casuarina*, York gum *Acacia* spp., *Banksia* spp., *Agonis flexuosa*, *Callitris* spp., *Allocasuarina* spp., *Eucalyptus loxophleba*.

The Mogumber System: Plateau and upper slopes are occupied by marri-wandoo woodlands, with York gum still on lower slopes. On lateritic ridges and breakaways the woodlands tend to open out with the development of dense sclerophyllous understory.

Vegetation Association 4.6: *Eucalyptus marginata*, *Corymbia calophylla, E. wandoo*.

Vegetation Association 1023: Wheatbelt; York gum, salmon gum etc. *Eucalyptus loxophleba, E. salmonophloia.* Goldfields; gimlet, redwood etc. *E. salubris, E. oleosa*. Riverine; rivergum *E. camaldulensis*.
Vegetation Association 1043.1: Low shrubs of mixed composition.
Vegetation Association 7.0: Wheatbelt; York gum, salmon gum etc. *Eucalyptus loxophleba, E. salmonophloia*. Goldfields; gimlet, redwood etc. *E. salubris, E. oleosa*. Riverine; rivergum *E. camaldulensis*.

The Walebing System: The catena comprises *Casuarina* thicket or *Banksia* heath on small relics of laterite on ridges, *Eucalyptus Wandoo* woodland on summits and upper slopes, merging downslope into *E. loxophleba*, and in turn, if there are extensive flats, into *E. salmonophloia*. *E. rudis* appears on creekbanks.

Vegetation Association 7.2: Wheatbelt; York gum, salmon gum etc. *Eucalyptus loxophleba, E. salmonophloia*. Goldfields; gimlet, redwood etc. *E. salubris, E. oleosa*. Riverine; rivergum *E. camaldulensis*.
Vegetation Association 1024.0: Wattle, *Casuarina* and teatree *Acacia-Allocasuarina-Melaleuca* alliance.

Table 3: Extent of pre-European vegetation associations intersecting the Caravel Copper Project survey areas

SUREVEY AREA	VEGETATION ASSOCIATION	STRUCTURE	AREA OF INTERSECTION (ha)
Potential Borefield Survey	Mogumber 1023.0	Woodland other	622.647
Potential Borefield Survey	Koojan 1030.2	Open low woodland	1635.578
Potential Borefield Survey	Mogumber 4.6	Woodland southwest	546.211
Potential Borefield Survey	Koojan 952.4	Heath	379.107
Mine Site Survey Area	Victoria plains 1024.0	Thicket	2.368
Mine Site Survey Area	Victoria plains 142.4	Woodland other	4610.559
Mine Site Survey Area	Victoria plains 694.0	Scrub-heath	2422.412
Mine Site Survey Area	Victoria plains 988.2	Samphire with thicket/scrub	1049.894
Paleochannel Area	Mogumber 1023.0	Woodland other	73.810
Paleochannel Area	Mogumber 1043.1	Heath	96.704
Paleochannel Area	Mogumber 7.0	Woodland other	885.071
Paleochannel Area	Walebing 7.2	Woodland other	538.580
Pipeline Survey Area	Victoria plains 1024.0	Thicket	0.522
Pipeline Survey Area	Walebing 1024.0	Thicket	6.360
Pipeline Survey Area	Victoria plains 142.4	Woodland other	19.057
Pipeline Survey Area	Walebing 7.2	Woodland other	128.193

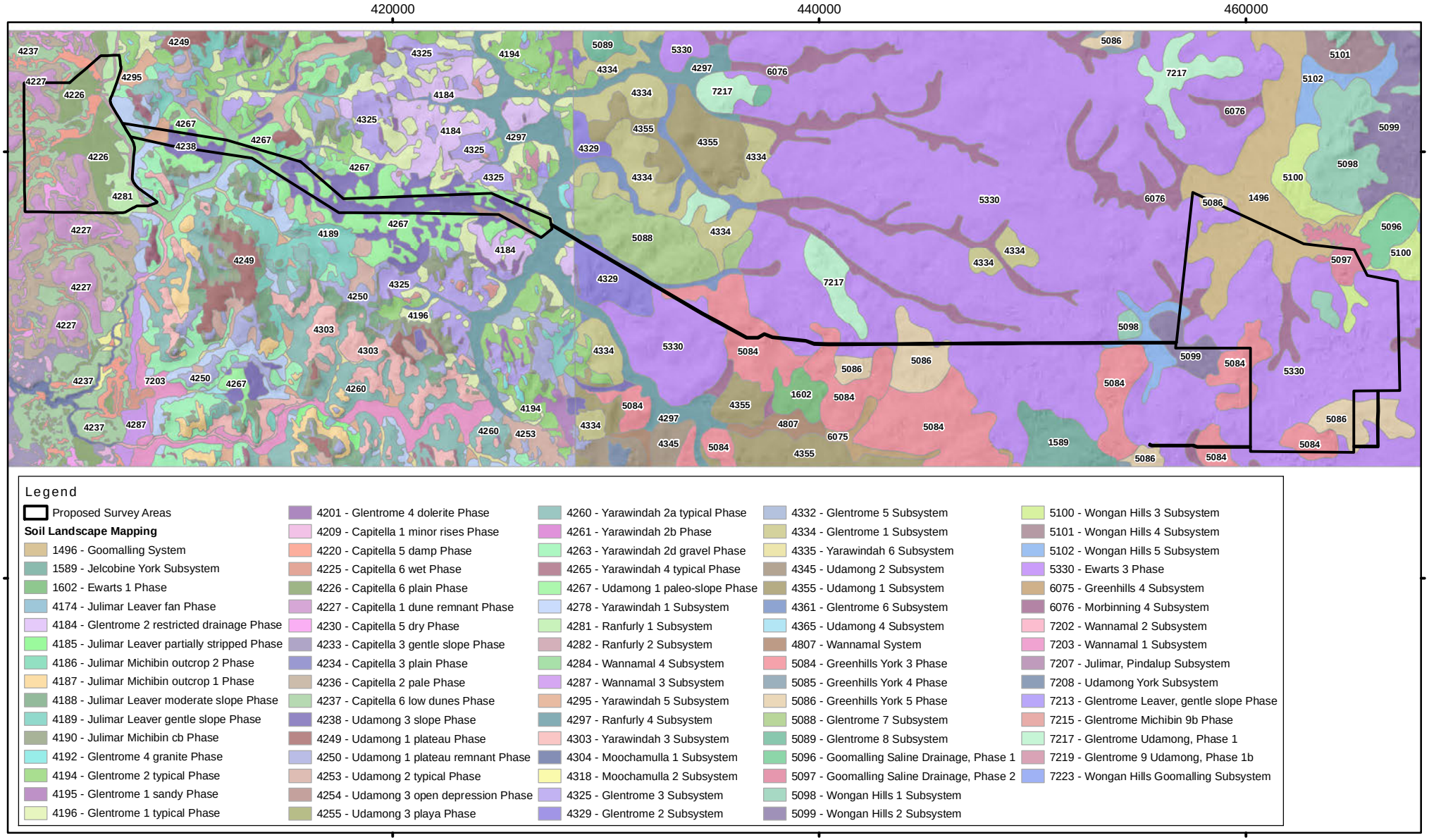
More recently, the Interim Biogeographic Regionalisation for Australia (IBRA) delineated 85 bioregions across Australia, based on a range of biotic and abiotic factors, including climate, vegetation, fauna, geology and landform (Thackway and Cresswell 1995; DAWE 2022c). IBRA Version 7 refined the original 85 bioregions and 403 subregions described in IBRA 6.1, by expanding the number of regions to 89 and the number of subregions to 419. The subregions represent more localised and homogenous geomorphological units in each bioregion. IBRA7 includes four new oceanic bioregions, and seven new subregions in the oceanic bioregions and six new subregions in South Australia (DAWE 2022c).

The Caravel Copper Project is situated across three IBRA sub-regions (DAWE 2022c). The Mine site survey area and Pipeline survey area are within the Avon Wheatbelt 2 (AVW02 - Katanning) IBRA subregion and the Paleochannel and potential Borefield survey areas are situated within the Jarrah Forest 1 (JAF01 - Northern Jarrah Forest) and Swan Coastal Plain 1 (SWA01 - Dandaragan Plateau) IBRA sub-regions.

Avon Wheatbelt 2 (AVW02 - Katanning): Proteaceous scrub-heaths, rich in endemics, on residual lateritic uplands and derived sandplains. Mixed eucalypt and *Allocasuarina huegeliana* and York-gum (*Eucalyptus loxophleba*) woodlands on quaternary alluvials and eluvials (Beecham 2001).

Jarrah Forest 1 (JAF01 - Northern Jarrah Forest): Jarrah-Marri Forest on laterite gravels and, in the eastern part, by woodlands of Wandoo - Marri on clayey soils. Eluvial and alluvial deposits support *Agonis* shrublands. In areas of Mesozoic sediments, Jarrah forests occur in a mosaic with a variety of species-rich shrublands (Beecham 2001).

Swan Coastal Plain 1 (SWA01 - Dandaragan Plateau): Characterised by Banksia low woodland, Jarrah - Marri woodland, Marri woodland, and by scrub-heaths on laterite pavement and on gravelly sandplains (Beecham 2001).



Client: CARAVEL MINERALS

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MGA94 (Zone 50)

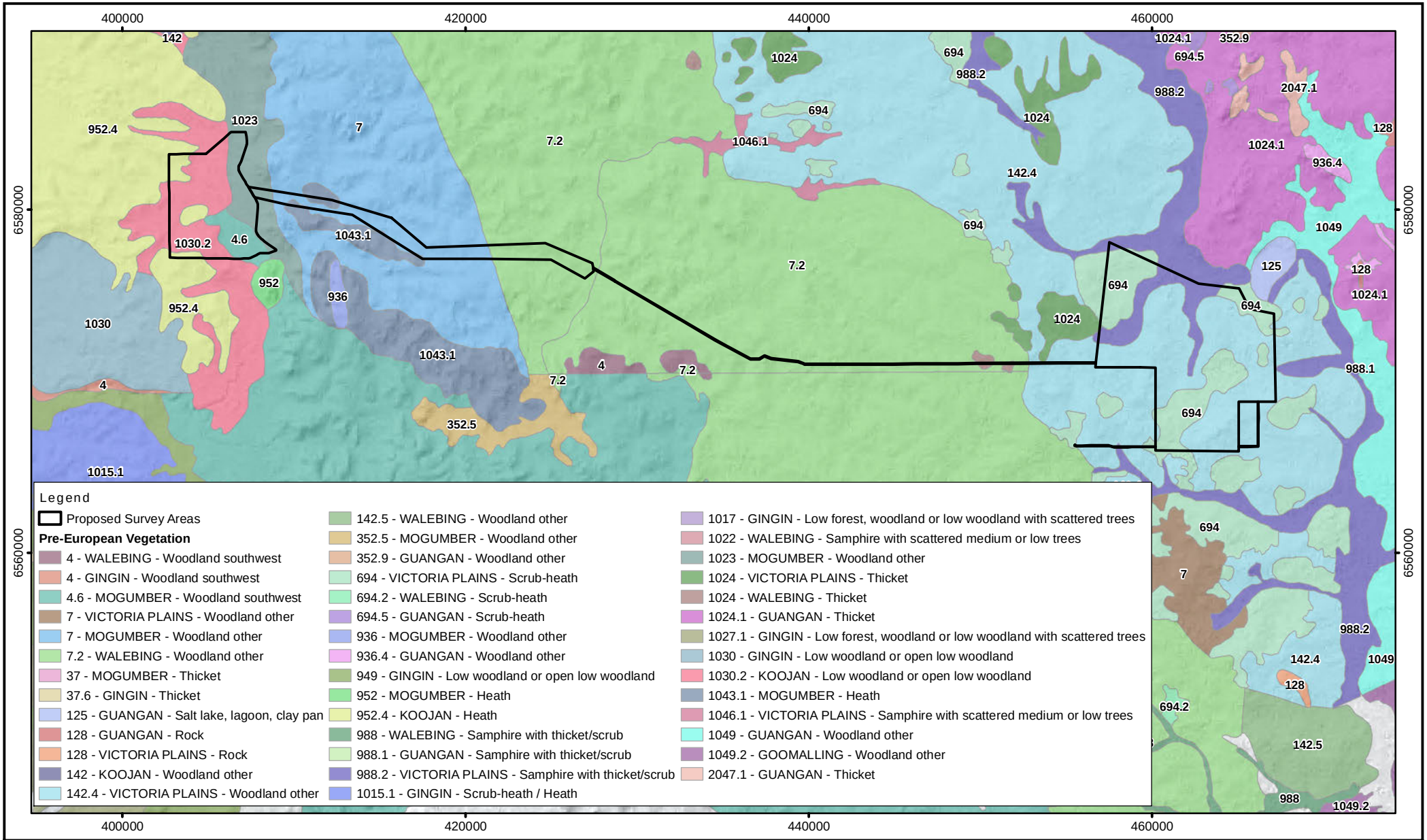
CAD Ref: a2668_f04_05

Date: July 2021 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref:
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Caravel Copper Project
Landforms and Soils

Figure: **5**



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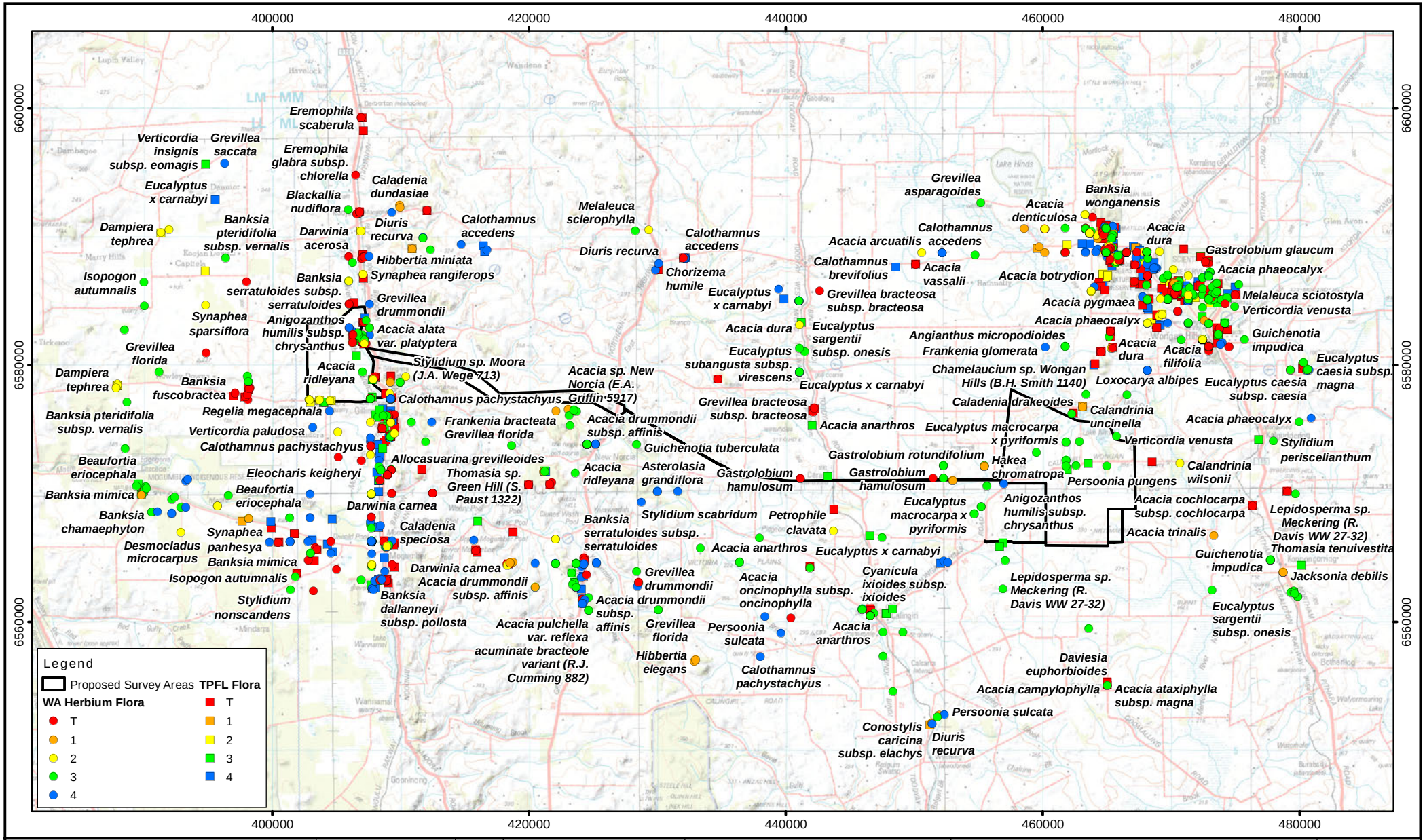
Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref:
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Caravel Copper Project
Pre-European Vegetation

Figure: **6**



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MGA94 (Zone 50)

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Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref:
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Caravel Copper Project
DBCA Flora Records

Figure: **7**

4.5 Potential Flora

A total of 1321 vascular plant taxa, representative of 365 genera and 91 families, have the potential to occur within the Caravel Copper Project survey areas (See Appendix B for full list of potential species). The most commonly represented families were the Myrtaceae (181 taxa), Fabaceae (174 taxa) and Proteaceae (133 taxa). The most commonly represented genera were *Acacia* (90 taxa), *Eucalyptus* (42 taxa) and *Melaleuca* (38 taxa).

4.6 Potential Threatened and Priority Flora

Fifty-four threatened flora species, pursuant to Part 2, Division 1, and Subdivision 2 of the *BC Act* and as listed by the DBCA (2022a) have the possibility of occurring in the Caravel Copper Project area (Appendix B). All of these species excluding one (*Grevillea bracteosa* subsp. *bracteosa*) are pursuant to section 179 of the *EPBC Act* or are listed by the DAWE (2022c) (Appendices B). Five of these species are listed as Vulnerable, 41 species are listed as Endangered and six are listed as Critically Endangered (Appendix B).

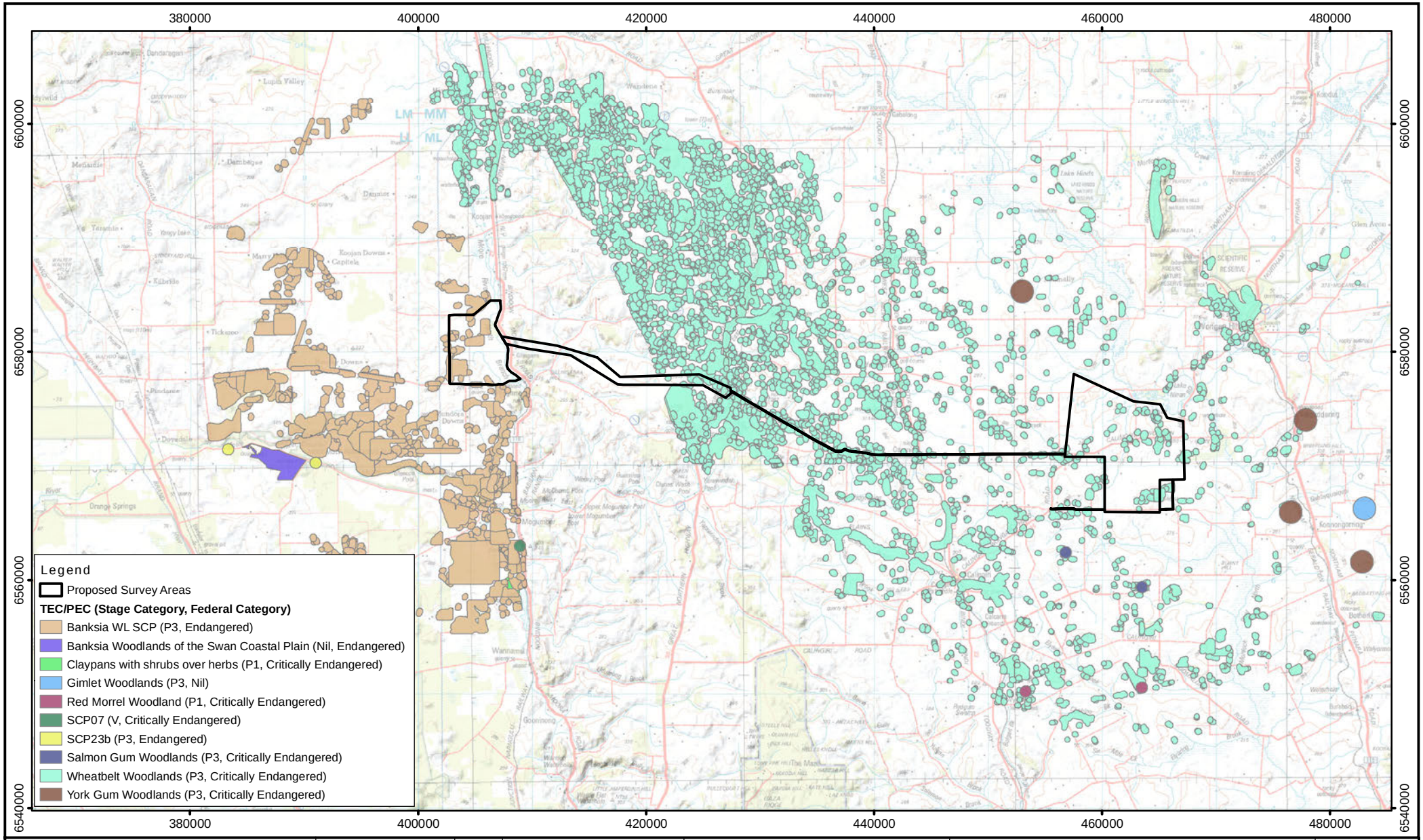
A total of 91 priority flora species, including 10 priority one, 13 priority two, 44 priority three and 24 priority four species as listed by the Western Australian Herbarium (1998-) have the potential to occur in the Caravel Copper Project area (Appendix B, Figure 7).

An assessment of the likelihood of recording any of the listed threatened and priority taxa within the Caravel Copper Project area was completed. The results were based on factors including known soil type, topography and distribution was set out in Appendix D.

Four threatened flora species had a medium-high likelihood of occurring within the survey area: *Banksia serratuloides* subsp*. serratuloides* (T), *Conospermum densiflorum* subsp. *unicephalatum* (T), *Darwinia acerosa* (T), *Gastrolobium hamulosum* (T). Six threatened flora species had a medium likelihood and twenty had a low likelihood of occurring in the Caravel Copper Project survey area. In terms of Priority flora, 12 priority flora species had a high likelihood of occurring in Caravel Copper survey area due to previous records in the area and suitable habitat: *Calandrinia wilsonii* (P2), *Synaphea sparsiflora* (P2), *Chamelaucium* sp. Wongan Hills (B.H. Smith 1140) (P2), *Eucalyptus macrocarpa × pyriformis* (P2), *Gastrolobium rotundifolium* (P3), *Guichenotia impudica* (P3), *Persoonia pungens* (P3), Pe*trophile plumosa* (P3), *Stylidium sacculatum* (P3), *Acacia alata* var. *platyptera* (P4), *Anigozanthos humilis* subsp. *chrysanthus* (P4) and *Calothamnus pachystachyus* (P4). Of the remaining priority species potential present in the survey area, 16 have a moderate likelihood of occurrence and 64 have a low likelihood of occurrence.

4.7 Threatened and Priority Ecological Communities

Two threatened ecological communities (TECs) listed by the DBCA (2022c) occur within the survey area (Figure 8). The 'Eucalypt Woodlands of the Western Australian Wheatbelt' community is an EBPC Act listed critically endangered TEC, and is noted as potentially occurring thought out the Mine site, Pipeline and Paleochannel survey areas. The 'Banksia Woodlands of the Swan Coastal Plain' community is an EBPC Act listed endangered TEC (DAWE 2022b) and is noted as potentially occurring throughout the potential Borefield survey area. Both communities are listed at the state level as Priority 3 Protected ecological communities (PECs) (DBCA 2022d). A separate report (Mattiske Consulting 2022) addresses the TEC assessment survey work which was undertaken concurrently with the flora and vegetation survey work.



Client: CARAVEL MINERALS

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MGA94 (Zone 50)

CAD Ref: a2668_f04_07

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Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref:
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Caravel Copper Project
TEC/PEC

Figure: **8**

4.8 Introduced (Exotic) Plant Species

A total of 105 introduced (exotic) plant taxa were recorded from the desktop assessment (Appendix B). With the exception of five taxa, all other introduced taxa are permitted species pursuant to Section 11 of the *Biosecurity and Agriculture Management Act 2007*.

**Chrysanthemoides monilifera* (Boneseed) is a Declared Pest pursuant to Section 12 of the BAM Act. **Chrysanthemoides monilifera* is a Declared pest for the whole of Western Australia (Department of Primary Industries and Regional Development, DPIRD 2022), and is subject to Control Category C1 (exclusion) control measures (Appendix A).

Echium plantagineum is listed as a Declared Pest pursuant to Section 22(2) of the Biosecurity and Agriculture Management Act 2007. **Echium plantagineum* is a Declared Pest for the whole of Western Australia (DPIRD 2022), and is not covered by any control category.

**Moraea miniata* (Two-leaf Cape Tulip) is listed as a Declared Pest pursuant to Section 22(2) of the Biosecurity and Agriculture Management Act 2007. **Morea miniata* is a Declared Pest for the whole of Western Australia (DPIRD 2022), and is not covered by any control category.

**Tamarix aphylla* is listed as a Declared Pest pursuant to Section 22(2) of the Biosecurity and Agriculture Management Act 2007. **Tamarix aphylla* is a Declared Pest for the whole of Western Australia (DPIRD 2022), and is not covered by any control category.

**Tamarix gallica* is a Declared Pest pursuant to Section 12 of the BAM Act. **Tamarix gallica* is a Declared pest for the whole of Western Australia (Department of Primary Industries and Regional Development, DPIRD 2022), and is subject to Control Category C1 (exclusion) control measures (Appendix A).

4.9 Other Matters

In addition to the items reviewed in the preceding paragraphs of this desktop assessment (paragraphs 4.1 through 4.7), the EPBC Act Protected Matters Report (DAWE 2022b) reveals that within 5 km of the survey area, the following applies:

World Heritage Properties	none
National Heritage Places	none
Wetlands of International Importance	none
Commonwealth Heritage Places	none

5. FIELD SURVEY RESULTS

A detailed flora and vegetation survey of the proposed Mine site area and the Koodjee Nature Reserve (within the potential Borefield area) was undertaken over three field trips during September 2018, September 2021 and October 2021. The survey comprised of data recorded during foot traverses as well as from 76 survey quadrats in the Mine site area 16 survey quadrats in the Koodjee Nature Reserve. The geographical coordinates of the north-west corner of the survey quadrats are set out in Appendix C.

5.1 Flora

Within the Mine site survey area, a total of 376 vascular plant taxa which are representative of 168 genera and 59 families were recorded within the survey area. The majority of taxa recorded were representative of the Myrtaceae (59 taxa), Asteraceae (44 taxa), and Poaceae (38 taxa) families. The taxa recorded during the survey are set out in Appendix G. A list of plant taxa recorded at each survey quadrat within the survey area is set out in Appendix H1.

Annual species represented 25.53 % of all recorded plant species within the Mine site survey area. The average species richness for the 76 survey quadrats was 16.22 ± 0.97 (mean ± s.e.m.), with a range of 3 to 46 species per quadrat.

Within the Koodjee Nature Reserve a total of 266 vascular plant taxa which are representative of 148 genera and 53 families were recorded within the survey area. The majority of taxa recorded were representative of the Myrtaceae (28 taxa), Poaceae (28 taxa), and Asteraceae (23 taxa) families. The taxa recorded during the survey are set out in Appendix G. A list of plant taxa recorded at each survey quadrat within the survey area is set out in Appendix H2.

Annual species represented 26.3 % of all recorded plant species within the Koodjee Nature reserve survey area. The average species richness for the 16 survey quadrats was 35.50 ± 3.40 (mean ± s.e.m.), with a range of 13 to 62 species per quadrat.

A number of plant species could not be identified accurately to species level due to the absence of sufficient taxonomic characters to enable accurate identification. The principal reason for not being able to fully identify some of the collected specimens to species level was that the plant material was sterile or lacked sufficient taxonomic features to permit accurate identification to genus or species level. In these cases, the species was identified as, for example, *Atriplex* sp.

61 plant specimens, some of which were known or suspected to represent conservation significant taxa, were submitted to the WAH for formal identification.

5.2 Proportion of Flora Surveyed

A species accumulation plot based on accumulated species recorded versus sites surveyed within the survey area was used to provide an indication as to the level of adequacy of the survey effort. As the number of survey sites increases, and correspondingly the size of the area surveyed increases, there should be a diminishing number of new species recorded. At some point, the number of new species recorded becomes essentially asymptotic. When the number of new species being recorded for survey effort expended approaches this asymptotic value, the survey effort can be considered to be adequate.

The species accumulation curve (Figure 9.1, 9.2), based on the species accumulation analysis of Colwell (2013) was used to evaluate the adequacy of sampling. Species by quadrat data was used in the species accumulation analysis. The asymptotic value was determined using Michaelis-Menten modelling. Using this analysis, the incidence-based coverage estimator of species richness (ICE, Chao 2004) was calculated for each of the survey areas.

For the Mine site area, the asymptotic value was determined to be 591.08. Based on this value, and the total of 371 species recorded in the 73 Mine site survey quadrats (minus three opportunistic quadrats),

approximately 63 % of the flora species potentially present within the combined survey area were recorded.

For the Koodjee Nature Reserve the asymptotic value was determined to be 406.59. Based on this value, and the total of 266 species recorded in the 16 survey quadrats, approximately 58 % of the flora species potentially present within the combined survey area were recorded (Figure 9.2).

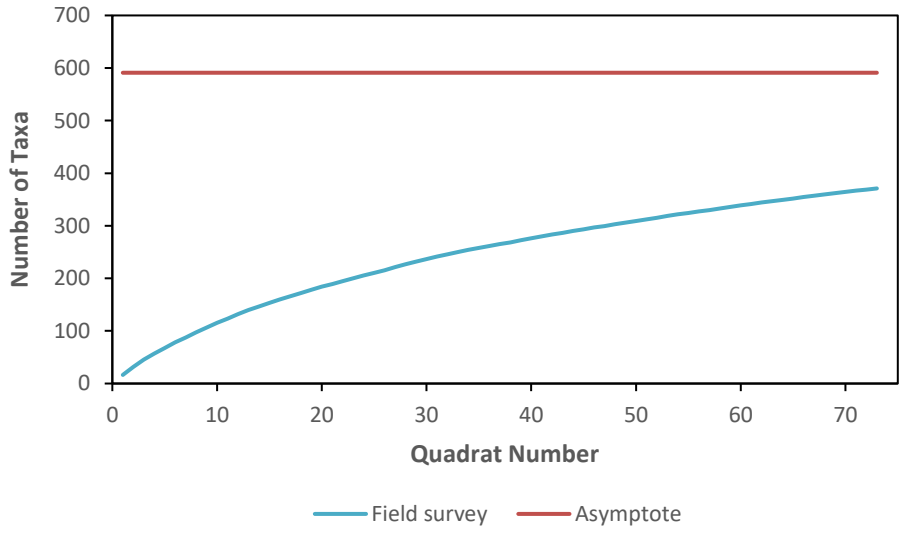


Figure 9.1: Average randomised species accumulation curve for the Mine site area

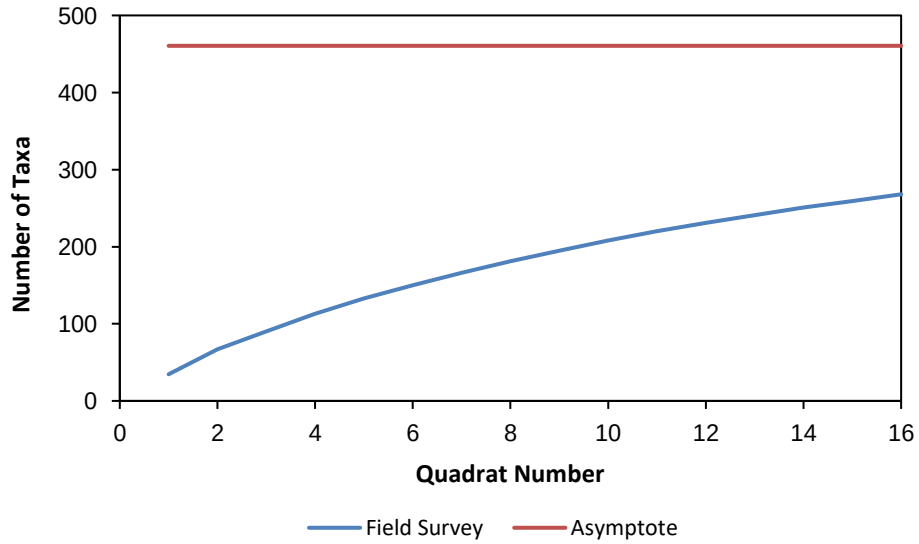


Figure 9.2: Average randomised species accumulation curve for the Koodjee Nature Reserve area

5.3 Threatened and Priority Flora

One threatened flora taxon, pursuant to Part 2, Division 1, Subdivision 2 of the BC Act and as listed by DBCA (2022a), and pursuant to section 179 of the *Environment Protection and Biodiversity Conservation Act 1999* and as listed by the DAWE (2022a), was recorded within the survey area. The taxon, *Banksia serratuloides* subsp*. serratuloides* (T), was recorded within the Koodjee Nature Reserve within quadrat KR09 (one record) and KR11 (one record).

Six priority flora taxa, as listed by the WAH (1998-), were recorded within the survey area. These taxa were *Calothamnus pachystachyus* (P4), *Chamelaucium* sp. Wongan Hills (B.H. Smith 1140) (P3), *Eucalyptus arachnaea* subsp. *arrecta* (P3), *Eucalyptus macrocarpa* subsp. *elachantha* (P4), *Petrophile plumosa* (P3) and *Stylidium* sp. Moora (J.A. Wege 713) (P2). The priority taxa were recorded both within survey quadrats and from opportunistic collections with in the wider survey area. The locations and populations of each taxon within the survey area are set out in Table 4 and Appendix E. A brief description of each taxon and its current state-wide distribution is set out in the subsequent paragraphs (Plate. 1 – 6).

- THREATENED (T): *Banksia serratuloides* subsp. *serratuloides* – Proteaceae: Low, bushy, lignotuberous shrub, 0.3-1 m high. Flowers yellow in July to September. Occurs in loam or clay loam over laterite, sandy gravel. WAH currently has 27 recorded of this species, from the Avon Wheatbelt, Jarrah Forest and Swan Coastal Plain. The current records constitute a range extension for this species.

Plate 1: Inflorescences and habit of *Banksia serratuloides* subsp. *serratuloides* (T) (WAH 1998-)

- PRIORITY 2 (P2): *Stylidium* sp. Moora (J.A. Wege 713) – Stylidiaceae: no description for this species currently available. WAH currently has 20 recorded of this species, from the Avon Wheatbelt, Jarrah Forest and Swan Coastal Plain. The current records fit within the known distribution for this species. No image is currently available for this taxon.

- PRIORITY 3 (P3): *Chamelaucium* sp. Wongan Hills (B.H. Smith 1140) – Myrtaceae: no description for this species currently available. WAH currently has 27 recorded of this species, from the Avon Wheatbelt, Geraldton Sandplains and Yalgoo. The current records fit within the known distribution for this species.

Plate 2: Inflorescences of *Chamelaucium* sp. Wongan Hills (B.H. Smith 1140) (P3) (WAH 1998-)

- PRIORITY 3 (P3): *Eucalyptus arachnaea* subsp. *arrecta* – Myrtaceae: Tree, 5-10 m high, bark rough. Flowers white-cream. Occurs in clay loam on granite or gravelly loam on breakaway slopes and gullies. WAH currently has 18 recorded of this species, from the Avon Wheatbelt and Geraldton Sandplains. The current records constitute a range extension for this species.

Plate 3: Fruit and habit of *Eucalyptus arachnaea* subsp. *arrecta* (P3) (WAH 1998-)

- PRIORITY 3 (P3): *Petrophile plumosa* – Proteaceae: Erect, compact shrub, 0.3-1.3 m high. Flowers yellow from July to November. Occurs in red/brown laterite, loam on sandplains and hills. WAH currently has 20 recorded of this species, from the Jarrah Forest and Swan Coastal Plain. The current record constitutes a range extension for this species.

Plate 4: Flowers and habit of *Petrophile plumosa* (P3) (Sainsbury 2020)

- PRIORITY 4 (P4): *Calothamnus pachystachyus* – Myrtaceae: Erect, much-branched, often straggly shrub, 0.6-1.7 m high. Flowers red-brown-black from August to October. Occurs in lateritic soils, often gravelly on ridges and road verges. WAH currently has 36 recorded of this species, from the Avon Wheatbelt, Jarrah Forest and Swan Coastal Plain. The current records fit within the known distribution for this species.

Plate 5: Habit and seeds of *Calothamnus pachystachyus* (P4) (WAH 1998-)

- PRIORITY 4 (P4): *Eucalyptus macrocarpa* subsp. *elachantha* – Myrtaceae: Spreading or sprawling mallee, 0.8-4 m high, with smooth bark, grey over salmon pink. Flowers red-pink from August to September or November to December. Occurs in white or grey sand over laterite on hillslopes, ridges and sandplains. WAH currently has 58 recorded of this species, from the Geraldton Sandplains and Swan Coastal Plain. The current records fit within the known distribution for this species.

Plate 6: Habit of *Eucalyptus macrocarpa subsp. elachantha* (P4) (KPBG 2022)

Table 4: Locations and populations of priority flora taxa recorded within the survey area

TAXON	BC ACT / DBCA LISTING	FAMILY	ABUNDANCE[1]	LOCATION (GDA94, zone 50)	
				mE	mN
Banksia serratuloides subsp. *serratuloides*	T	Proteaceae	1	406939	6581919
Banksia serratuloides subsp. *serratuloides*	T	Proteaceae	1	406754	6582287
Calothamnus pachystachyus	P4	Myrtaceae	80	406939	6581919
Calothamnus pachystachyus	P4	Myrtaceae	45	406754	6582287
Chamelaucium sp. Wongan Hills (B.H. Smith 1140)	P3	Myrtaceae	1	463792	6574920
Chamelaucium sp. Wongan Hills (B.H. Smith 1140)	P3	Myrtaceae	1	463765	6574921
Chamelaucium sp. Wongan Hills (B.H. Smith 1140)	P3	Myrtaceae	1	406603	6582182
Eucalyptus arachnaea subsp. *arrecta*	P3	Myrtaceae	1	464392	6567137
Eucalyptus arachnaea subsp. *arrecta*	P3	Myrtaceae	1	464362	6567185
Eucalyptus macrocarpa subsp. *elachantha*	P4	Myrtaceae	4	456490	6566182
Eucalyptus macrocarpa subsp. *elachantha*	P4	Myrtaceae	7	452804	6571043
Eucalyptus macrocarpa subsp. *elachantha*	P4	Myrtaceae	43	457036	6571062
Petrophile plumosa	P3	Proteaceae	1	406939	6581919
Stylidium sp. Moora (J.A. Wege 713)	P2	Stylidiaceae	1	406961	6581826
Stylidium sp. Moora (J.A. Wege 713)	P2	Stylidiaceae	1	406939	6581919

Notes: Abundance recorded within a within a 10 m x 10 m quadrat within survey area or during opportunistic collection. See Appendix E for full list of priority taxa locations.

5.4 Other taxa of interest

One species of interest was found within the survey area. An unnamed *Hibbertia* species was recorded (*Hibbertia* aff. *diamesogenos)* opportunistically from the pipeline area with a recorded population of 3 plants.

5.5 Introduced (Exotic) Plant Species

One declared pest organism pursuant to section 22 of the BAM Act was recorded within the project area. *Moraea flaccida* was recorded within the Mine site area in Quadrat MS88 and was also recorded opportunistically within the pipeline area. *Moraea flaccida* has a status of "Declared Pest - s22(2)" under the Department of Primary Industries and Regional Development (2022). The ranking of "Declared Pest - s22(2)" indicates that declared pests must satisfy any applicable import requirements when imported, and may be subject to an import permit if they are potential carriers of high-risk organisms. *Moraea flaccida* is exempt from any keeping categories meaning no permit or conditions are required for keeping.

Within the Mine site area, a total of 50 introduced (weed) species were recorded. The majority of these introduced taxa were from the Poaceae (22 taxa), Asteraceae (8 taxa) and Fabaceae (5 taxa) families. Annual species made up 68% of introduced species found within the Mine site area. See Appendix F for full introduced species list.

Within the Koodjee Nature Reserve area a total of 44 introduced (weed) species were recorded. None of these are declared pest organisms pursuant to section 22 of the *BAM Act* (all are permitted under section 11 of the *BAM Act*). The majority of these introduced taxa were from the Poaceae (15 taxa), Asteraceae (8 taxa) and Caryophyllaceae (5 taxa) families. Annual species made up 77 % of introduced species found within the Koodjee Nature Reserve. See Appendix F for full introduced species list.

5.6 Statistical Analysis of Survey Quadrat Data

Cluster analyses derived from a species-by-site resemblance matrix (Bray-Curtis similarity) grouped survey sites into discrete clusters based on species composition (dissimilarity/distance increased) (Clarke and Gorley 2015). Only taxa which could be identified to species level were included in the analysis unless they were considered a dominant species for that quadrat. Classification and ordination analyses were conducted on a data matrix of perennial taxa, with singularly occurring species and annual taxa omitted prior to analysis. This was justified on the basis that singleton taxa add little additional information, and annuals exhibit high inter-annual variation in distribution and abundance (Mott 1972, 1973). In addition, the omission of annual species from the statistical analysis allows for comparison of data from surveys undertaken in different seasons or survey years. Hierarchical Clustering was used in conjunction with Similarity Profile (SIMPROF), Similarity Percentages (SIMPER), site descriptions, site photos and aerial photographs; combining these methods increased the understanding of site inter-relations and thus the ability to accurately delineate those sites based on species composition.

A presence/absence transformation was not sufficient in delineating the communities, as excessive weighting was attributed to understorey species. A log-10 transformation of the data was used for statistical analysis within the Mine site area while a 4^{th} root transformation was used for the Koodjee Nature Reserve area, this enabled sufficient weighting to be given to dominant over storey species. Taxa which were identified to the subspecies and variety levels were revised to the specific level to reduce the tendency for this to create further statistical variation in analysis which was considered unnecessary. Computation of similarity matrices was based on the Bray Curtis similarity measure.

Where appropriate, outliers and small groupings were assigned to broader comparative vegetation units based on factors including species composition and site descriptions; this is particularly relevant where survey quadrats were established on ecotones. For the purposes of vegetation mapping, i.e., extrapolating quadrat data to generalised vegetation communities over broad areas, an inclusive rather than exclusive approach was adopted for outliers.

Similarity Profile Analysis (SIMPROF) of the 73 survey quadrats within the Mine site are identified 11 significantly associated groups of vegetation within the survey and two outlier quadrats. Following analysis of significant groups, vegetation communities were delineated using a combination of the SIMPROF results together with landform, soil data, and associated records of the survey quadrats. Where appropriate, larger groupings were split into multiple vegetation units and smaller groupings were combined based on factors including species composition and site descriptions.

The project area was fragmented and degraded as a result of crop farming and grazing causing a reduction in species richness and the ability to statistically delineate associated species. Therefore, quadrat observations of dominant overstorey species along with associated landforms and soils was necessary to supplement statistical groupings and provide an accurate representation of vegetation communities in the project area. Based on this approach, a total of 23 vegetation communities were delineated within the Mine site area (Figure 10.1).

Similarity Profile Analysis (SIMPROF) of the 16 survey quadrats within the Koodjee Nature Reserve area identified four significantly associated groups of vegetation within the survey and three outlier quadrats. Following analysis of significant groups, vegetation communities were delineated using a combination of the SIMPROF results together with landform, soil data, and associated records of the survey quadrats. Where appropriate, larger groupings were split into multiple vegetation units and smaller groupings were combined based on factors including species composition and site descriptions. Based on this approach, a total of 7 vegetation communities were delineated within the Koodjee Nature Reserve area (Figure 10.2).

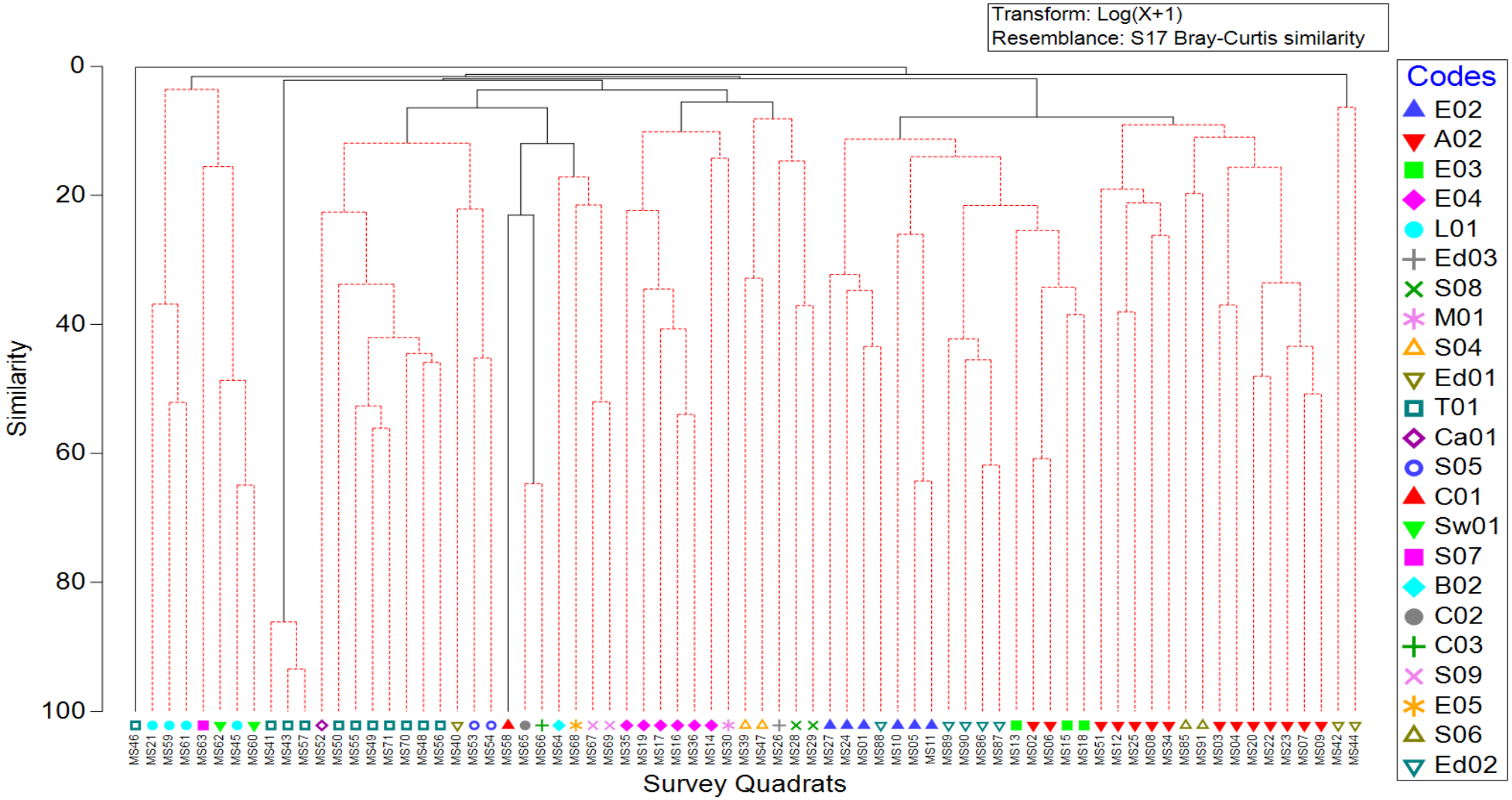


Figure 10.1: Dendrogram of the 73 survey quadrats established across the Mine site area

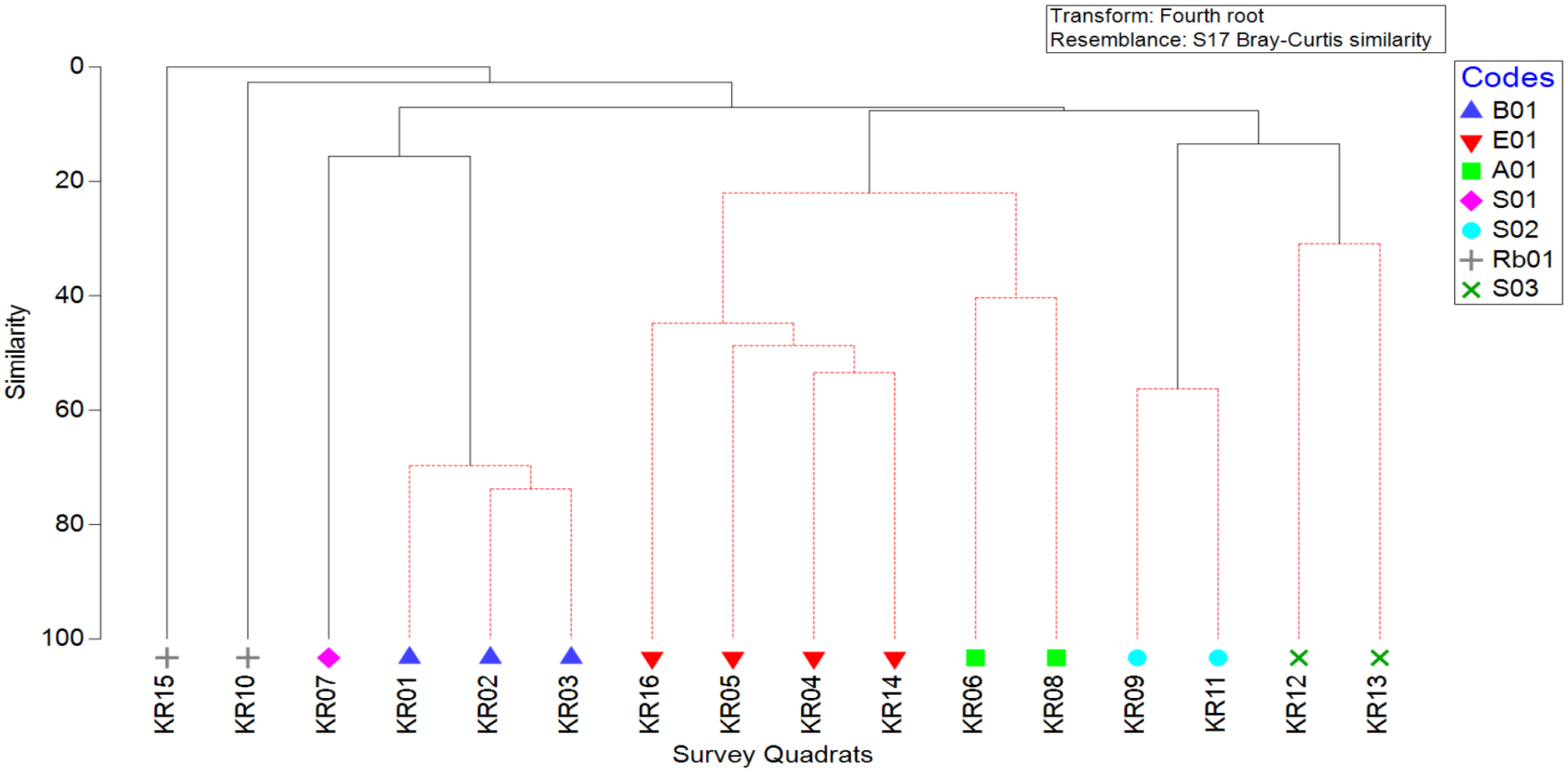


Figure 10.2: Dendrogram of the 16 survey quadrats established across the Koodjee Nature Reserve area

5.7 Vegetation Communities and Mapping

Based on the statistical analysis (Section 5.3), seven vegetation communities were defined and mapped across the Koodjee Reserve survey area and 23 vegetation communities were defined and mapped across the Mine site survey area (Figures 11.1.1 – 11.2.1). In addition to the statistical analysis, survey quadrat physical data and aerial photographic maps were used to delineate the boundaries of the vegetation communities in the Caravel Copper Project area. The descriptions of the vegetation communities were based on Aplin's (1979) modification of the vegetation classification system of Specht (1970), to align with the NVIS. Vegetation communities were described at the association level of the NVIS classification framework, as defined by the ESCAVI (2003) (Appendix A) and are summarised below. A listing of species recorded within each survey quadrat and each vegetation community are set out in Appendices H and K respectively. A summary of the vegetation communities is presented below and in Appendix J:

Koodjee Nature Reserve (potential Borefield area) vegetation communities:

S01 *Allocasuarina campestris, Calothamnus quadrifidus* subsp*. quadrifidus, Acacia blakelyi* tall open shrubland over *Lepidobolus preissianus, Melaleuca seriata, Acacia ericifolia* low open shrubland over *Triodia danthonioides* low sparse hummock grassland. On brown sandy loam on flats.

S02 *Allocasuarina campestris* tall sparse shrubland over *Calothamnus pachystachyus* (P4)*, Banksia sclerophylla, Banksia serratuloides* subsp*. serratuloides* (T) mid open shrubland over *Hibbertia acerosa, Conostylis androstemma, Ericomyrtus serpyllifolia* low sparse shrubland. On gravelly orange to light brown clayey loam soils on flats.

S03 *Melaleuca concreta* mid sparse shrubland over *Acacia lasiocarpa* low sparse shrubland over *Borya sphaerocephala* low sparse forbland. On grey to light brown clayey loam soils on flats.

Rb01 *Eucalyptus rudis* subsp. *rudis* low isolated clumps of trees over *Melaleuca viminea* subsp. *viminea, Melaleuca rhaphiophylla* tall sparse shrubland over *Tecticornia lepidosperma, *Cynodon dactylon, *Arctotheca calendula* low forbland. On grey clay soils along river banks.

B01 *Banksia attenuata, Banksia prionotes* low open woodland over *Allocasuarina humilis, Melaleuca seriata, Conospermum stoechadis* subsp*. stoechadis* mid sparse shrubland over *Alexgeorgea nitens, Mesomelaena pseudostygia, Amphipogon turbinatus* low sparse rushland. On cream/ white sand on flats and slopes.

E01 *Eucalyptus wandoo* mid open woodland over *Neurachne alopecuroidea* low grassland. On orange brown clay loam to clayey sand soils on floodplains.

A01 *Eucalyptus wandoo* subsp*. wandoo* mid open woodland over *Allocasuarina campestris* tall closed shrubland over *Melaleuca radula* mid isolated clumps of shrubs. On orange brown clay loam on flats and slopes.

Mine Site area vegetation communities:

S04 *Grevillea hookeriana* subsp*. hookeriana* mid sparse shrubland over *Desmocladus asper* low open rushland. On light grey to brown sand on flats.

S05 *Melaleuca lateriflora* tall sparse shrubland over *Rhagodia preissii* subsp*. preissii* low open shrubland. On grey brown sandy clay on flats.

S06 *Eucalyptus ebbanoensis* subsp*. ebbanoensis, Eucalyptus loxophleba* low isolated clumps of trees over *Thryptomene racemulosa, Leptospermum roei* tall open shrubland over *Austrostipa hemipogon* tall sparse grassland. On grey brown sandy clay loam soils on flats.

S07 *Melaleuca scalena, Melaleuca hamulosa* tall shrubland. On brown sand on flats.

S08 *Santalum murrayanum, Melaleuca acuminata* tall sparse shrubland over *Chamelaucium* sp. Wongan Hills (B.H. Smith 1140) (P3), *Melaleuca hamulosa, Rhagodia* sp. Watheroo (R.J. Cranfield & P.J. Spencer 8183) low open shrubland over *Austrostipa elegantissima* tall sparse grassland. On pale orange sandy clay loam on flats.

S09 *Melaleuca lateriflora, Melaleuca adnata* tall sparse shrubland over *Rhagodia drummondii, Enchylaena lanata, Tecticornia indica* subsp*. bidens* low open chenopod shrubland over **Lolium rigidum* tall sparse grassland*.* On brown to black sandy loam on flats and edge of lakes.

B02 *Banksia prionotes* mid open woodland over *Rhagodia drummondii, Comesperma volubile, Scholtzia drummondii* mid sparse shrubland over *Ehrharta calycina* tall grassland. On brown loamy sand soils on flats.

E02 *Eucalyptus loxophleba* subsp*. loxophleba, Eucalyptus loxophleba* subsp*. supralaevis* mid open forest over *Acacia acuminata, Santalum acuminatum, Allocasuarina campestris* tall sparse shrubland over **Avena barbata, *Ehrharta calycina, Austrostipa scabra* subsp*. scabra* tall closed grassland. On orange brown sandy clay loam soils on flats and slopes.

E03 *Eucalyptus wandoo* low open woodland over *Acacia brumalis, Banksia hewardiana* tall sparse shrubland. On grey brown clay loam soils on flats.

E04 *Eucalyptus salmonophloia* tall open woodland over *Melaleuca marginata, Maireana brevifolia, Eremophila drummondii,* mid open shrubland over *Enchylaena lanata* tall sparse chenopod shrubland. On red brown clay loam soils on flats.

E05 *Eucalyptus horistes* mid open woodland over *Rhagodia drummondii, Hakea preissii, Melaleuca scalena* mid sparse shrubland over *Triodia danthonioides, Eragrostis dielsii, Austrostipa nitida* tall sparse grassland. On cream sandy soils on flats.

Ed01 *Eucalyptus* spp*.* mid to tall woodland over *Enchylaena lanata* low isolated clumps of shrubs. On brown loamy sand on flats.

Ed02 *Eucalyptus wandoo, Eucalyptus salmonophloia* mid open woodland over *Acacia acuminata* tall sparse shrubland over *Austrostipa hemipogon* tall open grassland. On grey brown sandy clay loam soils on flats.

Ed03 *Eucalyptus celastroides* subsp*. virella* low woodland over *Enchylaena lanata, *Mesembryanthemum nodiflorum, Austrostipa elegantissima* low sparse forbland. On brown red clayey loam soils on flats and slopes.

A02 *Allocasuarina campestris* low open woodland over *Acacia acuminata* tall open shrubland over *Ecdeiocolea monostachya, Waitzia acuminata, Borya sphaerocephala* low forbland. On red to brown sandy clay loam soils on flats.

C01 *Casuarina obesa* low open woodland over *Grevillea levis, Dodonaea pinifolia, Ericomyrtus serpyllifolia* mid open shrubland over *Styphelia serratifolia, Ecdeiocolea monostachya* low sparse shrubland. On pale brown to grey sandy loam on flats.

C02 *Casuarina obesa* mid woodland over *Hakea preissii, Rhagodia drummondii*, **Juncus acutus* tall open rushland over **Bromus hordeaceus* low grassland. On black sandy loam soils on flats.

C03 *Casuarina obesa* mid open woodland over *Grevillea hookeriana* subsp*. hookeriana, Rhagodia drummondii, *Juncus acutus* mid sparse shrubland over **Ehrharta calycina* tall sparse grassland. On black sandy loam on edge of salt lake.

T01 *Eucalyptus loxophleba* subsp*. loxophleba* low isolated clumps of mallee trees over *Thryptomene mucronulata, Rhagodia preissii* subsp*. preissii, Hakea* ?*circumalata* mid sparse shrubland over *Tecticornia lepidosperma, Tecticornia pergranulata* subsp*. pergranulata, Triglochin mucronata* tall samphire shrubland. On brown to black loamy sand or white sand with pink/grey clay on seasonally inundated wetlands/ salt lakes.

L01 *Casuarina obesa* low open woodland over *Melaleuca viminea* subsp*. viminea, Melaleuca scalena* tall shrubland over *Lepidosperma* sp. tall closed sedgeland. On yellow to brown sandy clay loam soils in seasonally inundated wetland.

Ca01 *Callitris arenaria* tall open shrubland over *Rhagodia preissii* subsp*. preissii*, *Hakea* ?*circumalata*, *Melaleuca* ?*halmaturorum* mid sparse shrubland over *Calandrinia granulifera, Eragrostis dielsii, Tecticornia lepidosperma* low sparse shrubland. On orange brown to white clayey sand on edge of salt lake.

Sw01 *Melaleuca viminea* subsp. *viminea, Acacia blakelyi* tall closed shrubland. On grey to black sandy loam in seasonally inundated swampland.

M01 *Maireana brevifolia* low isolated clumps of chenopod shrubs over **Bromus rubens, *Brassica ×napus* low grassland. On red brown clay loam on edge of salt lake.

The areas mapped and percentage cover for each vegetation community delineated in the survey area are set out in Table 5.

Table 5: Area coverage of each vegetation community within the survey area

SURVEY AREA	VEGETATION COMMUNTIY	AREA MAPPED (ha)	PROPORTION OF MAPPED COMMUNITY WITHIN THE SURVEY AREA (%)
Koodjee Nature Reserve	Rb01	3.0	2.3
Koodjee Nature Reserve	S01	0.5	0.3
Koodjee Nature Reserve	B01	59.7	45.3
Koodjee Nature Reserve	E01	32.4	24.6
Koodjee Nature Reserve	S02	2.0	1.5
Koodjee Nature Reserve	S03	5.1	3.8
Koodjee Nature Reserve	A01	2.9	2.2
Mine site area	L01	30.39	0.38
Mine site area	C01	2.44	0.03
Mine site area	Ca01	2.06	0.03
Mine site area	T01	782.29	9.65
Mine site area	Ed01	10.76	0.13
Mine site area	S04	10.73	0.13
Mine site area	S05	26.41	0.33
Mine site area	Sw01	5.01	0.06
Mine site area	M01	2.13	0.03
Mine site area	S06	0.71	0.01
Mine site area	Ed02	7.91	0.10
Mine site area	S07	1.52	0.02
Mine site area	B02	2.90	0.04
Mine site area	C02	4.24	0.05
Mine site area	E02	18.11	0.22
Mine site area	S08	6.67	0.08
Mine site area	A02	33.08	0.41
Mine site area	E03	3.35	0.04
Mine site area	E04	19.06	0.24
Mine site area	Ed03	1.02	0.01
Mine site area	E05	8.30	0.10
Mine site area	C03	7.25	0.09
Mine site area	S09	13.12	0.16

5.8 Condition of the Vegetation

The condition of the vegetation within the Caravel Copper project area ranged from Degraded to Pristine. The condition rating of remnant vegetation patches within the project area was categorised according to the Keighery scale (Keighery 1994; Appendix A). Figures 12.1.1 to 12.2.1 show the vegetation condition of the Caravel Copper project area. Within the Caravel Copper project area these areas can be delineated as follows:

Degraded: Along the Moore River North in Koodjee Nature Reserve. Areas of Ed01, Ed02, Ed03 and M01 vegetation and along roads in the Mine site area.

Poor: Areas of B02 and E03 vegetation located mainly in the north of the Mine site area.

Good: Banks either side of the Moore River North in Koodjee Nature Reserve. Areas of A02, C02, E02 and S09 vegetation located in the north and south of the Mine site area.

Very good: Made up the majority of the mapped area throughout the Mine site area.

Excellent: Predominantly across the western side of Koodjee Nature Reserve within areas of B01, A01 and S01 vegetation. Areas of Ca01, S05 and S08 vegetation located in the north of the Mine site area.

Pristine: Along the eastern side of the Koodjee Nature Reserve in areas of S03 and S02 vegetation. Vegetation community C01 within the Mine site area.

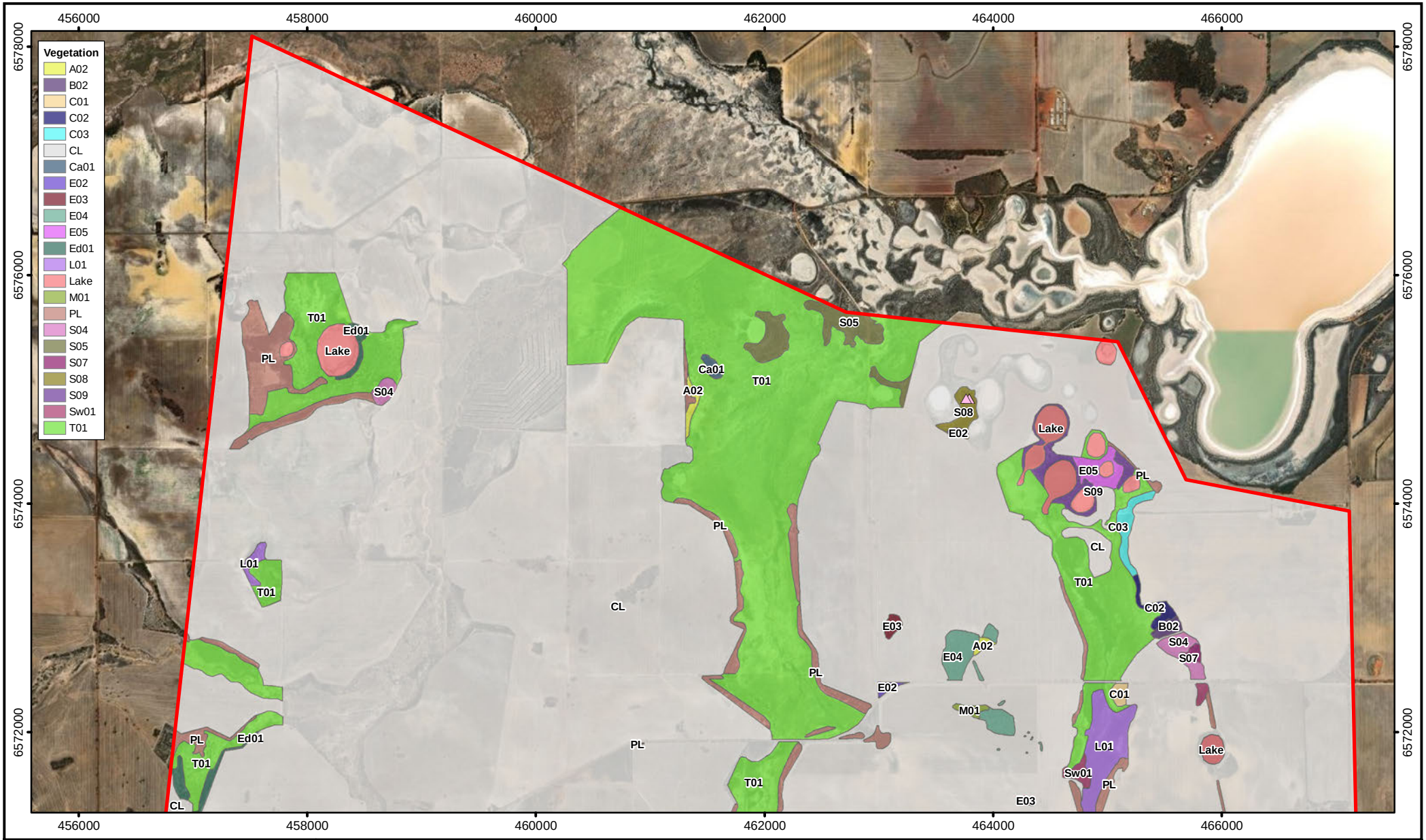
The areas mapped and percentage for each vegetation condition rating within the survey area are set out in Table 6a - b.

Table 6a: Condition rating of areas within the Mine site survey area

VEGETATION COMMUNTIY	AREA MAPPED (ha)	PROPORTION OF MAPPED COMMJNITY WITHIN THE SURVEY AREA (%)
Degraded	22.49	0.28
Poor	6.26	0.08
Good	67.02	0.83
Very good	866.11	10.69
Excellent	35.14	0.43
Pristine	2.44	0.03
Planted	173.86	2.15
Cleared Land	6930.88	85.52217
Totals	8104.19	100.00

Table 6b: Condition rating of areas within the Koodjee Nature Reserve

VEGETATION COMMUNTIY	AREA MAPPED (ha)	PROPORTION OF MAPPED COMMJNITY WITHIN THE SURVEY AREA (%)
Degraded	2.98	2.26
Poor	0.00	0.00
Good	32.42	24.58
Very good	0.00	0.00
Excellent	63.12	47.86
Pristine	7.06	5.35
Unsurveyed	26.31	19.95
Totals	131.88	100.00



Legend

Survey Area

Flora

△ *Chamelaucium* sp. Wongan Hills (B.H. Smith 1140) (P3)

Imagery: ESRI, Maxar (Feb 2021)

Client: CARAVEL MINERALS

N

0 0.5 1km

Scale: 1:45,000
MGA94 (Zone 50)

CAD Ref: a2668_f07_01

Date: March 2022 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref:
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Caravel Copper Project
Mine Site Area
Vegetation Communities

Figure: **11.1.1**

Legend

Survey Area

Flora

Eucalyptus arachnaea subsp. *arrecta* (P3)

Eucalyptus macrocarpa subsp. *elachantha* (P4)

Imagery: ESRI, Maxar (Feb 2021)

Client: CARAVEL MINERALS

N

0 0.5 1km

Scale: 1:45,000

MGA94 (Zone 50)

CAD Ref: a2668_f07_02

Date: March 2022 | Rev: A | A4

Mattiske Consulting Pty Ltd

28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640

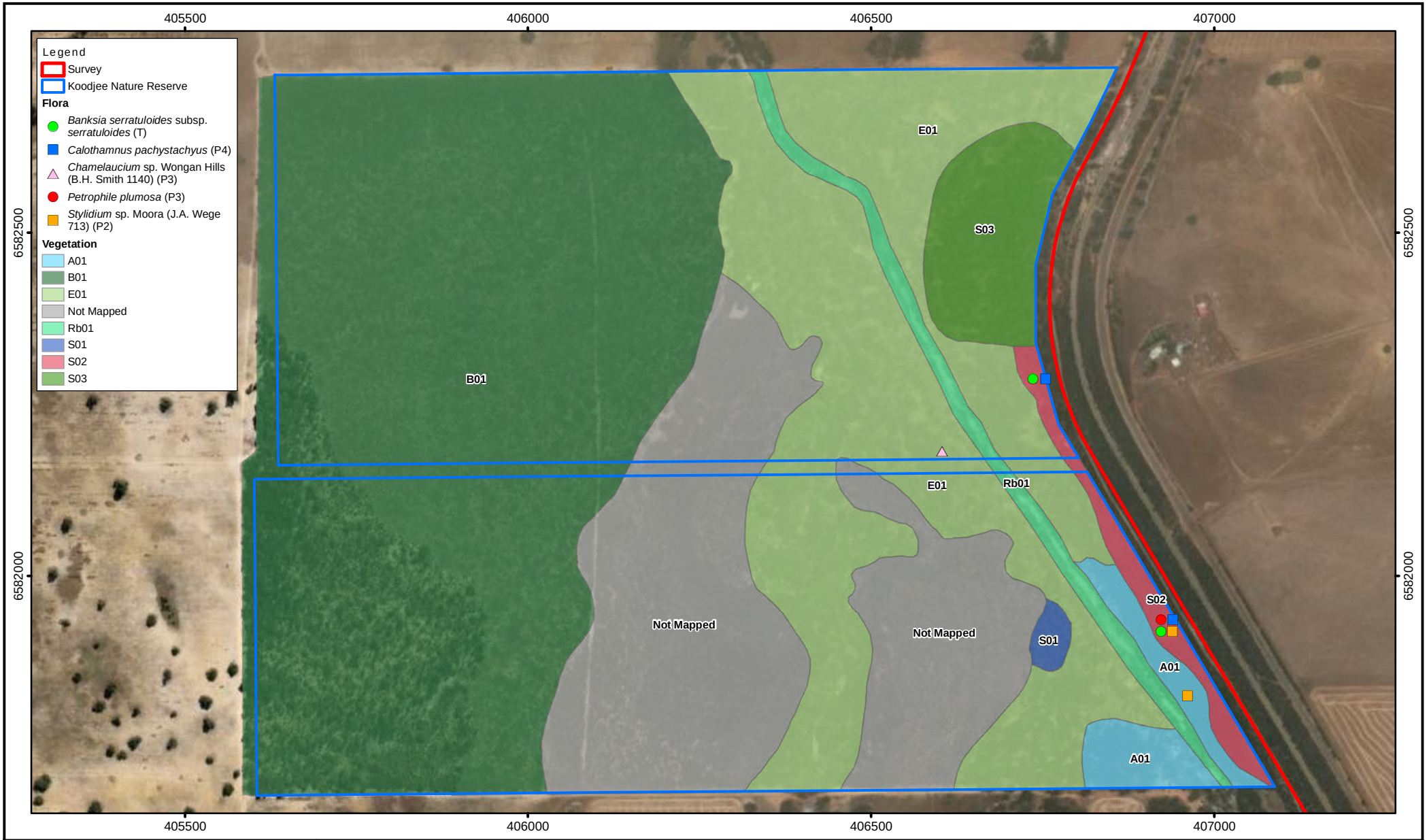
Author: E M Matttiske | MCPL Ref:

Drawn: CAD Resources ~ www.cadresources.com.au

Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Caravel Copper Project
Mine Site Area
Vegetation Communities

Figure: **11.1.2**



Imagery: ESRI, Maxar (Feb 2021)

Client: CARAVEL MINERALS

N

0 75 150 m

Scale: 1:7,500
MGA94 (Zone 50)

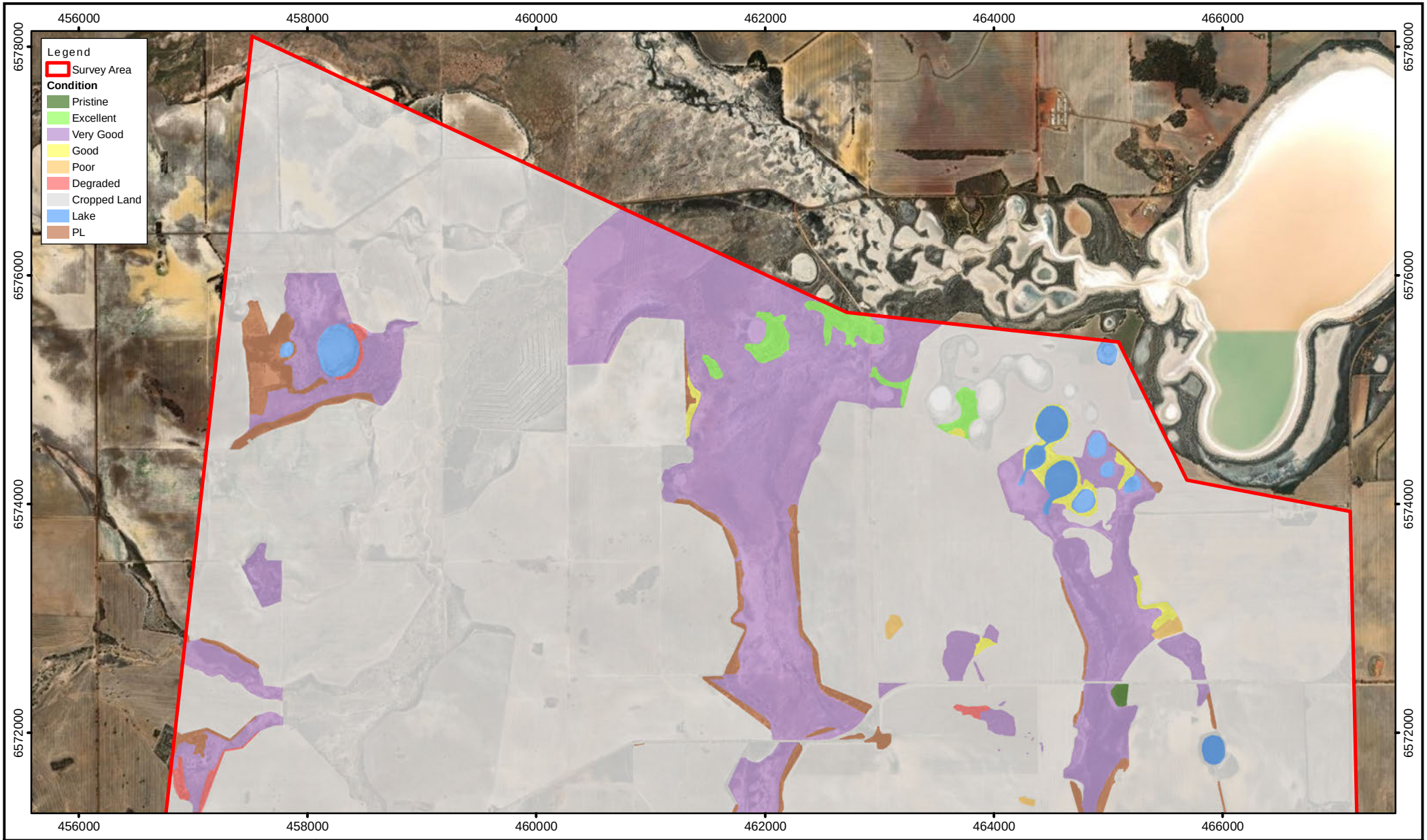
CAD Ref: a2668_f07_03

Date: March 2022 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref:
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Caravel Copper Project
Koodjee Nature Reserve
Vegetation Communities

Figure: **11.2.1**



Imagery: ESRI, Maxar (Feb 2021)

Client: CARAVEL MINERALS

N

0 0.5 1km

Scale: 1:45,000
MGA94 (Zone 50)

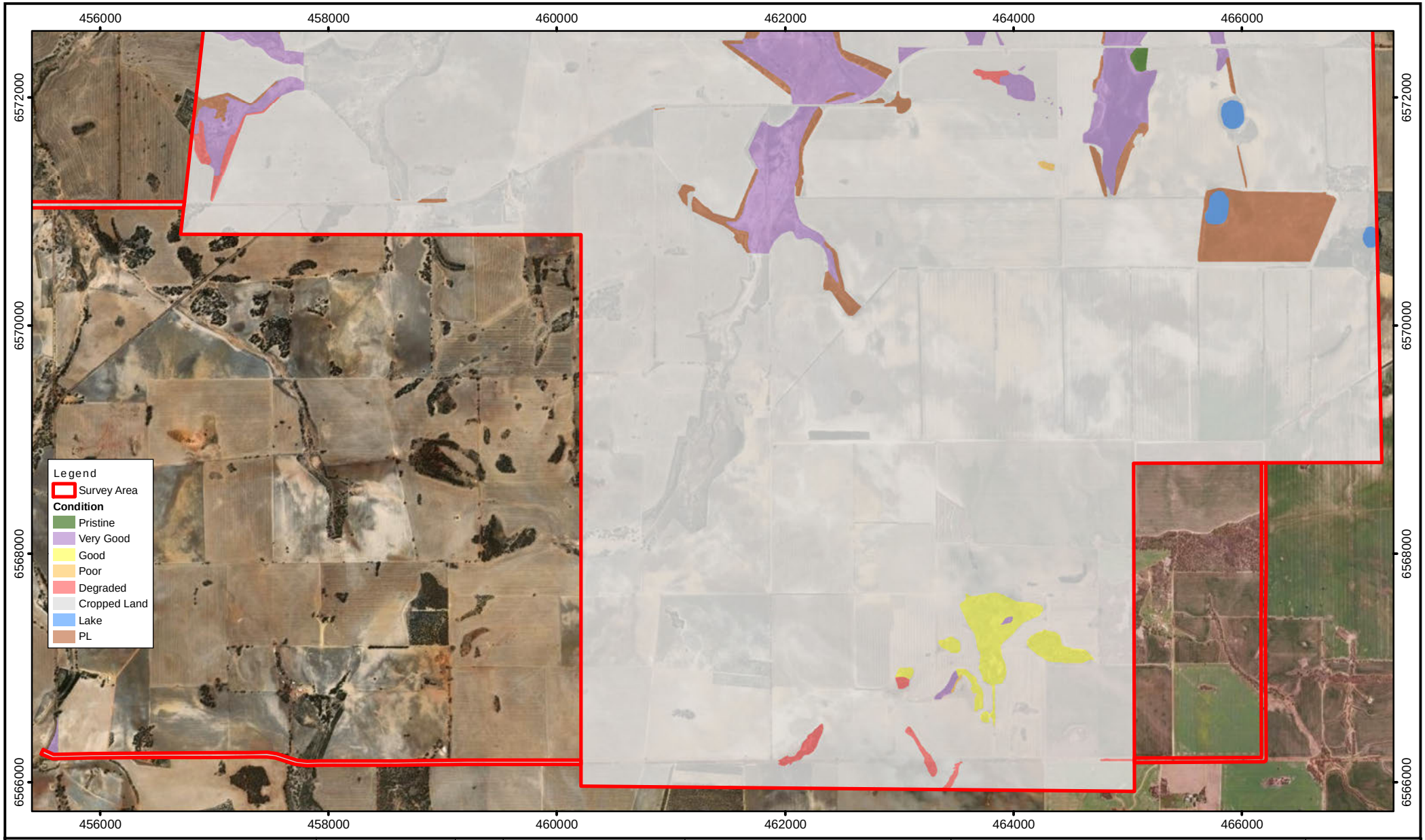
CAD Ref: a2668_f08_01

Date: March 2022 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref:
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Caravel Copper Project
Mine Site Area
Vegetation Condition

Figure: **12.1.1**



Imagery: ESRI, Maxar (Feb 2021)

Client: CARAVEL MINERALS

N

0 0.5 1km

Scale: 1:45,000
MGA94 (Zone 50)

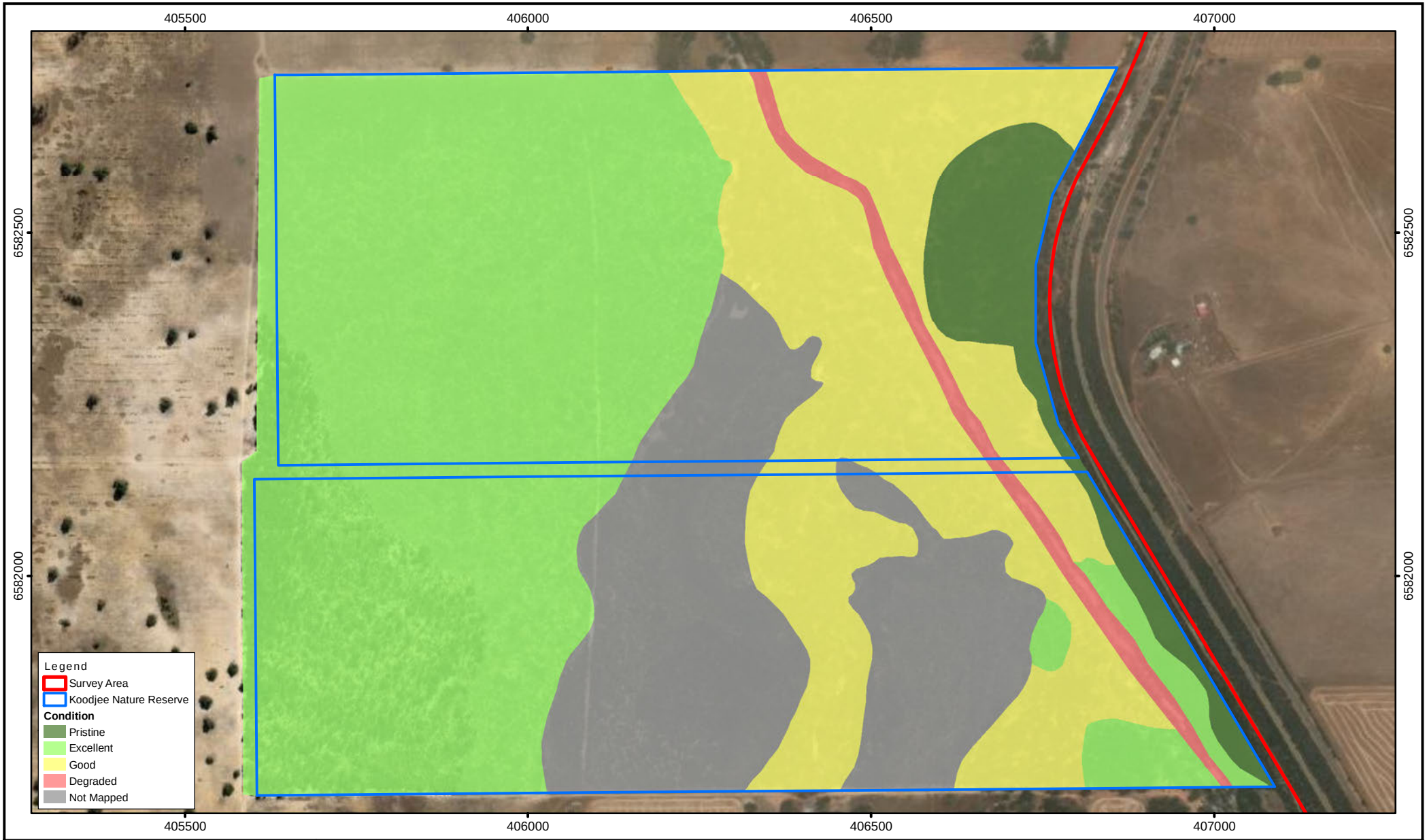
CAD Ref: a2668_f08_02

Date: March 2022 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref:
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Caravel Copper Project
Mine Site Area
Vegetation Condition

Figure: **12.1.2**



Imagery: ESRI, Maxar (Feb 2021)

Client: CARAVEL MINERALS

N

0 75 150 m

Scale: 1:7,500
MGA94 (Zone 50)

CAD Ref: a2668_f08_03

Date: March 2022 | Rev: A | A4

Mattiske Consulting Pty Ltd
28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640
Author: E M Matttiske | MCPL Ref:
Drawn: CAD Resources ~ www.cadresources.com.au
Tel: (08) 9246 3242 ~ Fax (08) 9246 3202

Caravel Copper Project
Koodjee Nature Reserve
Vegetation Condition

Figure: **12.2.1**

6. DISCUSSION

Rainfall in the month preceding the November 2018 survey was above the long-term average for the corresponding period. Rainfall in the four months preceding the September 2021 survey was 232 mm, which is approximately 96% of the long-term average for the corresponding period (BOM 2022). The majority of taxa recorded were either in flower and/or were fruiting, thus permitting the collection of adequate specimens for identification. This was especially important for the range of annual taxa recorded.

A review of the potential constraints associated with the survey determined that the survey was not subject to constraints that would adversely affect the outcome of the survey nor the conclusions formed from the results. It was however determined that follow up surveys would allow vegetation communities to be determined from some additional areas within the Mine site area (due to access permissions) and the potential Borefield area (due to low definition of potential area and also access permission).

Across the Caravel Copper Project a total of 92 quadrats (including 3 opportunistic sites) were selected in which flora and vegetation was described and sampled systematically. Within the Mine site area a total of 376 vascular plant taxa, representative of 168 genera and 59 families, were recorded. The majority of taxa recorded were representative of the Myrtaceae (59 taxa), Asteraceae (44 taxa) and Poaceae (38 taxa) families. Within the Koodjee nature reserve A total of 266 vascular plant taxa, representative of 148 genera and 53 families, were recorded. The majority of taxa recorded were representative of the Myrtaceae (28 taxa), Poaceae (28 taxa), and Asteraceae (23 taxa) families.

One species of threatened flora taxa, pursuant to Part 2, Division 1, Subdivision 2 of the BC Act and as listed by DBCA (2022a), and pursuant to section 179 of the *Environment Protection and Biodiversity Conservation Act 1999* and as listed by the DAWE (2022a), was recorded within the survey area. *Banksia serratuloides* subsp*. serratuloides* (T) was recorded within the Koodjee Nature Reserve within quadrat KR09 (one record) and KR11 (one record). The current records constitute a range extension for this species.

Six priority flora taxa, as listed by the WAH (1998-), were recorded within the survey area. Within the Koodjee Nature reserve *Calothamnus pachystachyus* (P4), *Chamelaucium* sp. Wongan Hills (B.H. Smith 1140) (P3), *Petrophile plumosa* (P3) and *Stylidium* sp. Moora (J.A. Wege 713) (P2) were recorded. Within the Mine site area *Chamelaucium* sp. Wongan Hills (B.H. Smith 1140) (P3) and *Eucalyptus arachnaea* subsp. *arrecta* (P3) were recorded. Within the pipeline area through opportunistic collection *Chamelaucium* sp. Wongan Hills (B.H. Smith 1140) (P3), *Eucalyptus arachnaea* subsp. *arrecta* (P3) and *Eucalyptus macrocarpa* subsp. *elachantha* (P4) were recorded. Records from within the Caravel Copper project area constitute a range extension for *Eucalyptus arachnaea* subsp*. arrecta* (P3) and *Petrophile plumosa* (P3).

In total 16 threatened or priority taxa were identified as having a high likelihood of being recorded in the project area, it is possible that additional threatened and priority taxa may occur in the Caravel Copper project area which were not identified during the current survey, due to the survey being conducted outside of some species flowering period.

One declared pest organism pursuant to section 22 of the *BAM Act* was recorded within the project area. *Moraea flaccida* was recorded within the Mine site area and was also recorded opportunistically within the pipeline area. *Moraea flaccida* has a status of "Declared Pest - s22(2)" under the Department of Primary Industries and Regional Development (2022). Within the Mine site area a total of 50 introduced (weed) species were recorded. The majority of these introduced taxa were from the Poaceae (22 taxa), Asteraceae (8 taxa) and Fabaceae (5 taxa) families. DBCA ecological impact rating describes 14 of these 50 weed species as having a high ecological impact (DBCA 2013b). Within the Koodjee Nature Reserve a total of 44 introduced species were recorded.

The majority of these introduced taxa were from the Poaceae (15 taxa), Asteraceae (8 taxa) and Caryophyllaceae (5 taxa) families. DBCA ecological impact rating describes 13 of these 44 weed species as having a high ecological impact (DBCA 2013b). These species cause acute disruption of ecological processes, and dominate and/or significantly alter vegetation structure, composition and function of ecosystems (DBCA 2013a). The presence of these species illustrates the degraded nature of the remnant vegetation within the project area and their proximity to the cropping farmland.

Within the Carvel Copper Project area two potential protected or threatened ecological communities were identified. The Eucalypt Woodlands of the Western Australian Wheatbelt is listed as a PEC, pursuant to subsection (1) section 27 of the *BC Act 2016* and is categorised as a Critically Endangered TEC under the *EPBC Act 1999* by the Department of the Environment and Energy (2015). This TEC was recorded as occurring within the Caravel Copper project area. The Banksia Woodlands of the Swan Coastal Plain ecological community is listed as a is listed as a PEC, pursuant to subsection (1) section 27 of the *BC Act 2016* and is categorised as an Endangered TEC under the *EPBC Act 1999* by the Department of the Environment and Energy (2016). This TEC was recorded as occurring within the Caravel Copper project area. The extent and overall condition of these ecological communities is discussed further in the adjoining report - Interim TEC report for the Caravel Copper Project (Mattiske 2022).

Lake Ninan Nature Reserve (WA27026) and unnamed nature reserve (WA40257) (both IUCN class 1a reserves) are located on the northern and north-eastern boundary of the Mine site area. While Koodjee Nature Reserve (WA20738) and Gillingarra Nature Reserve (WA02332) fall within the potential Borefield area. Additional studies will be required to address potential issues impacting these reserves.

The vegetation of the Mine site area ranged from degraded to pristine. Large areas of crop farmland were considered to be completely degraded including areas adjacent to the road alongside the proposed pipeline route. Most of the larger remnant vegetation patches (those greater than 2 ha) had a condition rating of degraded to pristine, with the majority rated as very good.

Within the Mine site area 23 vegetation communities were delineated and mapped across the Caravel Copper project area. The degraded nature of many of the remnant vegetation patches in the proposed project area meant a reduction in species richness and the ability to statistically delineate associated species. Therefore, quadrat observations of dominant overstorey species along with associated landforms and soils was necessary to supplement statistical groupings and provide an accurate representation of vegetation communities in the project area. The vegetation communities present occurred on a range of different associated soils and landforms. The woodland proportion of the surveyed area is dominated by *Allocasuarina campestris* open woodlands over *Acacia acuminata* open shrublands over mixed forblands on red to brown sandy clay loam soils on flats, or alternatively, by eucalypt woodland communities on brown sandy-clay loam soils, occasionally associated with granite outcrops and laterite. These Eucalypt woodland communities include; Open forests of *Eucalyptus loxophleba* over *Acacia acuminata* over mixed weedy grasslands, open woodlands of *Eucalyptus wandoo* over *Acacia brumalis* and *Banksia hewardiana* sparse shrublands and open woodlands of *Eucalyptus salmonophloia* over *Melaleuca marginata* over sparse chenopod shrublands. These communities are interspersed with *Casuarina obesa* open woodlands over Proteaceae, Chenopodiaceae, or Myrtaceae variable mixed understories, often occurring on dark sandy-loam soils.

The majority of the northern proportion of the Mine site area is dominated by shrubland communities consisting of isolated *Eucalyptus loxophleba* trees over mixed sparse Myrtaceae and Proteaceae shrubs over mixed *Tecticornia* spp. samphire shrublands situated on salt flats with white clay pan and brown sand. This dominant shrubland community is interspersed with multiple other shrubland communities often dominated by either Proteaceae, Chenopodiaceae, or Myrtaceae species over mixed grasslands, generally occurring on brown sandy-clay loam soils on flats or around wetlands.

The vegetation communities present in the Mine site area have been influenced by agricultural developments over many decades in the local area and as such there has been a decline in the extent of remnant areas of native vegetation. The total extent of vegetation mapped by Mattiske based on the associated vegetation communities is accounts for 14.51 % of the Mine site area. Although several remnants within the Caravel Copper project area are less disturbed, the majority of areas support a range of introduced species.

Within the Koodjee Nature Reserve seven vegetation communities were delineated and mapped across the Caravel Copper project area. Quadrat observations of dominant overstorey species along with associated landforms and soils were used to supplement statistical groupings and provide an accurate representation of vegetation communities in the project area.

The western side of the Koodjee Nature Reserve is dominated by a Banksia woodland vegetation community consisting of an open woodland of *Banksia attenuata and Banksia prionotes* over a sparse shrubland of *Allocasuarina humilis, Melaleuca seriata* and *Conospermum stoechadis* subsp*. stoechadis* over a sparse rushland of *Alexgeorgea nitens, Mesomelaena pseudostygia* and *Amphipogon turbinatus* situated on cream or white sands on flats and slopes. The Banksia woodland community recorded a condition rating of excellent and meets the criteria to be categorised as part of the "Banksia Woodlands of the Swan Coastal Plain" threatened ecological community (see Mattiske Consulting 2022). One feature to note was the apparent edge effect which can be observed from arial photography by an increase in density (and associated darkening) of the vegetation along the boundary of the woodland where it meets cleared paddock land. This affect is most likely due to fertilizer run off from the adjacent farmland. A follow up survey may be warranted to further assess the total vegetation and condition of this *Banksia* woodland community.

Woodland areas within the Koodjee Nature Reserve ran along either side of the Moore River and consisted of open woodlands of *Eucalyptus wandoo* over *Neurachne alopecuroidea* grassland on orange brown clay loam to clayey sand soils on floodplains and open woodlands of *Eucalyptus wandoo* over closed shrublands of *Allocasuarina campestris* over isolated clumps of shrubs of *Melaleuca radula* situated on orange brown clay loam on flats and slopes. The areas directly either side of the Moore River within the Koodjee Nature reserve recoded a condition rating of degraded, this area showed evidence of significant disturbance and a high proportion of introduced species. Further from the banks of the river the vegetation was recorded as good with a lower level of disturbance but still supporting introduced species.

The eastern side of the Koodjee Nature Reserve was dominated by drier, highly diverse shrublands, including; open shrublands of *Allocasuarina campestris, Calothamnus quadrifidus* subsp*. quadrifidus* and *Acacia blakelyi* over low shrublands of *Lepidobolus preissianus, Melaleuca seriata, Acacia ericifolia* over a sparse grassland of *Triodia danthonioides* on brown sandy loam on flats; sparse shrublands of *Allocasuarina campestris* tall over open shrublands of *Calothamnus pachystachyus* (P4)*, Banksia sclerophylla, Banksia serratuloides* subsp*. serratuloides* (T) over low sparse shrubland of *Hibbertia acerosa, Conostylis androstemma, Ericomyrtus serpyllifolia* on gravelly orange to light brown clayey loam soils on flats; and sparse shrubland of *Melaleuca concreta* over *sparse shrubland of Acacia lasiocarpa* over *Borya sphaerocephala* sparse forbland on grey to light brown clayey loam soils on flats. These shrublands consisted of a high proportion of conservation significant flora and were all in either an excellent or pristine condition with little disturbance or introduced weed species.

In general, the vegetation communities present in the Koodjee Nature Reserve have mostly escaped the negative impacts of the surrounding cleared agricultural lands. However, it should be noted that the river does show signs of past dredging and vegetation running either side of it is of a poorer condition mainly due to a high proportion of introduced species. Despite this, and the aforementioned edge effect impact on the Banksia woodland – the Nature Reserve should be of high conservation value, mainly due to the number of unique communities, many in excellent condition supporting a high proportion of conservation significant taxa, as well as potential habitat for local fauna.

Future work within the potential Borefields area should focus on the placement of additional quadrats in the south western part of the Koodjee Nature Reserve as well as expansion into other remnant vegetation areas of interest, in particular Gillingarra Nature Reserve which is situated on the same river system further downstream.

7. ACKNOWLEDGEMENTS

The author would like to thank Mr Mike Hislop of the Western Australian Herbarium for his assistance in identifying a number of the flora collected during the course of the field survey work.

8. PERSONNEL

The following Mattiske Consulting personnel were involved in this project:

NAME	POSITION	SURVEY INVOLVEMENT	FLORA COLLECTION PERMIT
Dr E. M. Mattiske	Managing Director & Principal Ecologist	planning, management, fieldwork and report review	FB62000019-2 and TFL26-1920
Mr D. Angus	Principal Botanist	planning, plant identifications, data analysis and report preparation	FB62000022-4 and TFL25-1920
Ms K. Lambert	Senior Botanist	planning, fieldwork, data analysis and report preparation	FB62000023-4
Ms Louisa Cockram	Senior Botanist	fieldwork, plant identifications, data analysis and report preparation	FB62000266-2
Ms Lily McDermott	Botanist	fieldwork	FB62000367
Ms Alannah Rowe	Botanist	fieldwork	FB62000020-4

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APPENDIX A1: THREATENED AND PRIORITY FLORA DEFINITIONS

Under section 179 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), threatened flora are categorised as extinct, extinct in the wild, critically endangered, endangered, vulnerable and conservation dependent (Table A1.1).

Table A1.1 Federal definition of Threatened Flora Species

Note: Adapted from section 179 of the *EPBC Act 1999.*

CODE	CATEGORY	DEFINITION
Ex	Extinct	Species which at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
ExW	Extinct in the Wild	Species which is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or 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.
CE	Critically Endangered	Species which 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.
E	Endangered	Species which is not critically endangered and it is facing a very high risk of extinction in the wild in the immediate or near future, as determined in accordance with the prescribed criteria.
V	Vulnerable	Species which is not critically endangered or endangered and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
CD	Conservation Dependent	Species which at a particular time if, at that time, 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 within a period of 5 years.

The *Biodiversity Conservation Act 2016* (*BC Act*) provides for (amongst other things) the protection of flora facing an extremely high risk of extinction in the wild in the immediate, near or medium-term future in Western Australia under Part 10, Division 2.

Threatened flora are listed in the *Wildlife Conservation (Rare Flora) Notice 2018* (under Part 2 of the *BC Act*; DBCA 2022a) and are categorised under Schedules 1-3. A flora species is defined as threatened if it is facing an extremely high risk of extinction in the wild in the immediate, near or medium-term future, pursuant to sections 20, 21 and 22 of the *BC Act*. Threatened species are categorised as critically endangered, endangered, and vulnerable (Table A1.2).

Table A1.2 State definition of Threatened Flora Species

Note: Adapted from DBCA (2022b).

CODE	CATEGORY	DEFINITION
CR	Critically endangered	Species considered to be facing an extremely high risk of becoming extinct in the wild (listed under Schedule 1 of the *Wildlife Conservation (Rare Flora) Notice 2018*).
EN	Endangered	Species considered to be facing a very high risk of becoming extinct in the wild (listed under Schedule 2 of the *Wildlife Conservation (Rare Flora) Notice 2018*).
VU	Vulnerable	Species considered to be facing a high risk of becoming extinct in the wild (listed under Schedule 3 of the *Wildlife Conservation (Rare Flora) Notice 2018*).

Priority flora species are defined as “possibly threatened species that do not meet the survey criteria, or are otherwise data deficient; or are adequately known, are rare but not threatened, meet criteria for near threatened or have recently been removed from the threatened species list for other than taxonomic reasons” (DBCA 2022b). Priority species are not afforded any additional protection under state or federal legislation, however are considered significant under the Environmental Protection Authority’s *Environmental Factor Guideline: Flora and Vegetation* (EPA 2016b). The Department of Biodiversity, Conservation and Attractions categorises priority flora into four categories: Priority 1; Priority 2, Priority 3 and Priority 4 (Table A1.3).

Table A1.3: State definition of Priority Flora Species

Note: Adapted from DBCA (2022b).

CODE	CATEGORY	DEFINITION
P1	Priority 1: Poorly-known species	Known from one or a few locations (< 5) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation; or are otherwise under threat of habitat destruction or degradation. In urgent need of further survey.
P2	Priority 2: Poorly-known species	Known from one or a few locations (< 5). Some occurrences are on lands managed primarily for nature conservation. In urgent need of further survey.
P3	Priority 3: Poorly-known species	Known from several locations and the species does not appear to be under imminent threat; or from few but widespread locations with either a large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. In need of further survey.
P4	Priority 4: Rare, Near Threatened, and other species in need of monitoring	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. b) Near Threatened - Species that are considered to have been adequately surveyed and that do not qualify for Conservation Dependent, but that are close to qualifying for Vulnerable. c) Other - Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

APPENDIX A2: THREATENED AND PRIORITY ECOLOGICAL COMMUNITY DEFINITIONS

Under section 181 of the *EPBC Act 1999*, threatened ecological communities are categorised as critically endangered, endangered and vulnerable (Table A2.1).

Table A2.1 Federal definition of Threatened Ecological Communities

Note: Adapted from section 181 and section 182 of the *EPBC Act*.

CATEGORY	DEFINITION
Critically Endangered	If, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future.
Endangered	If, at that time, it is not critically endangered and is facing a very high risk of extinction in the wild in the near future.
Vulnerable	If, at that time, it is not critically endangered or endangered, and is facing a high risk of extinction in the wild in the medium-term future.

The *Biodiversity Conservation Act 2016* (*BC Act*) provides for (amongst other things) some protection of ecological communities at risk of collapse in Western Australia under Part 3 (Division 2).

Threatened ecological communities (TECs) are listed in the *List of Threatened Ecological Communities endorsed by the Western Australian Minister for Environment (28 June 2018)* (under Part 2 of the *BC Act*; DBCA 2022c). An ecological community is defined as threatened if "it is facing an extremely high risk of collapse in the immediate, near or medium-term future", pursuant to sections 28, 29 and 30 of the *BC Act*. Threatened ecological communities are categorised as critically endangered, endangered, and vulnerable (Table A2.2). Some of these TECs are also endorsed by the Federal Minister as threatened, and some of these are listed under the *EPBC Act* and therefore afforded legislative protection at the Commonwealth level.

Table A2.2 State definition of Threatened Ecological Communities

Note: Adapted from DBCA (2022b).

CODE	CATEGORY	DEFINITION
CR	Critically Endangered	An ecological community will be listed as CR when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future, meeting any one or more of the following criteria: 1. The estimated geographic range and distribution has been reduced by at least 90% and is either continuing to decline with total destruction imminent, or is unlikely to be substantially rehabilitated in the immediate future due to modification; 2. The current distribution is limited i.e. highly restricted, having very few small or isolated occurrences, or covering a small area; or 3. The ecological community is highly modified with potential of being rehabilitated in the immediate future.
EN	Endangered	An ecological community will be listed as EN when it has been adequately surveyed and is not CR, but is facing a very high risk of total destruction in the near future. The ecological community must meet any one or more of the following criteria: 1. The estimated geographic range and distribution has been reduced by at least 70% and is either continuing to decline with total destruction imminent in the short term future, or is unlikely to be substantially rehabilitated in the short term future due to modification; 2. The current distribution is limited i.e. highly restricted, having very few small or isolated occurrences, or covering a small area; or 3. The ecological community is highly modified with potential of being rehabilitated in the short term future.
VU	Vulnerable	An ecological community will be listed as VU when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing high risk of total destruction in the medium to long term future. The ecological community must meet any one or more of the following criteria: 1. The ecological community exists largely as modified occurrences that are likely to be able to be substantially restored or rehabilitated; 2. The ecological community may already be modified and would be vulnerable to threatening process, and restricted in range or distribution; or 3. The ecological community may be widespread but has potential to move to a higher threat category due to existing or impending threatening processes.

Priority ecological communities (PECs) are defined as possible threatened ecological communities that do not meet the stringent survey criteria for the assessment of threatened ecological communities, and are listed by the DBCA (2022d) in the *Priority Ecological Communities for Western Australia – Version 32 (15 July 2021)*. Similarly, to priority flora, PECs are not afforded additional legislative protection, however are considered significant under the EPA (2016b) *Environmental Factor Guideline: Flora and Vegetation*. The Department of Biodiversity, Conservation and Attractions categorises priority ecological communities into five categories: Priority 1; Priority 2, Priority 3, Priority 4 and Priority 5 (Table A2.3).

Table A2.3 State definition of priority ecological communities

Note: Adapted from DBCA (2022b).

CODE	CATEGORY	DEFINITION
P1	Priority 1 (Poorly known ecological communities)	Ecological communities that are known from very few, restricted occurrences (generally ≤ 5 occurrences or a total area of ≤ 100 ha). Most of these occurrences are not actively managed for conservation (e.g. located within agricultural or pastoral lands, urban areas, or active mineral leases) and for which immediate threats exist.
P2	Priority 2 (Poorly known ecological communities)	Communities that are known from few small occurrences (generally ≤ 10 occurrences or a total area of ≤ 200 ha). At least some occurrences are not believed to be under immediate threat of destruction or degradation.
P3	Priority 3 (Poorly known ecological communities)	1. Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation; 2. Communities known from a few widespread occurrences, which are either large or within significant remaining areas of habitat in which other occurrences may occur, much of it not under imminent threat; or 3. Communities made up of large, and/or widespread occurrences, that may or not be represented in the reserve system, but are under threat of modification across much of their range from processes such as grazing and inappropriate fire regimes.
P4	Priority 4 (Ecological communities that are adequately known, rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list. These communities require regular monitoring)	1. Rare – Communities known from few occurrences that are considered to have been adequately surveyed, sufficient knowledge is available, and are considered not to be currently threatened. 2. Near Threatened – Communities considered to have been adequately surveyed and do not qualify for Conservation Dependent, but are close to qualifying for Vulnerable. 3. Communities that have been removed from the list of threatened communities during the past five years.
P5	Priority 5 (Conservation Dependent ecological communities)	Ecological communities that are not threatened but are subject to a specific conservation program, the cessation of which would result in the community becoming threatened within five years.

APPENDIX A3: CATEGORIES AND CONTROL MEASURES OF DECLARED PEST (PLANT) ORGANISMS IN WESTERN AUSTRALIA

Section 22 of Western Australia's *Biosecurity and Agriculture Management Act 2007* (BAM Act) makes provision for a plant taxon to be listed as a declared pest organism in respect to parts of, or the entire State. According to the BAM Act, a declared pest is defined as a prohibited organism (Section 12), or an organism for which a declaration under Section 22 (2) of the Act is in force.

Under the *Biosecurity and Agriculture Management Regulations 2013* (WA), declared pest plants are placed in one of three control categories, C1 (exclusion), C2 (eradication) or C3 (management), which determines the measures of control which apply to the declared pest (Table A4.1). The current listing of declared pest organisms and their control category is through the Western Australian Organism List (DPIRD 2022).

Table A3.1 Categories and control measures of declared pest (plant) organisms

Note: Adapted from *Biosecurity and Agriculture Management Regulations 2013*.

CONTROL CATEGORY	CONTROL MEASURES
C1 (Exclusion) '(a) Category 1 (C1) — Exclusion: if in the opinion of the Minister introduction of the declared pest into an area or part of an area for which it is declared should be prevented.' Pests will be assigned to this category if they are not established in Western Australia and control measures are to be taken, including border checks, in order to prevent them entering and establishing in the State.	In relation to a category 1 declared pest, the owner or occupier of land in an area for which an organism is a declared pest or a person who is conducting an activity on the land must take such of the control measures specified in subregulation (1) as are reasonable and necessary to destroy, prevent or eradicate the declared pest.
C2 (Eradication) '(b) Category 2 (C2) — Eradication: if in the opinion of the Minister eradication of the declared pest from an area or part of an area for which it is declared is feasible.' Pests will be assigned to this category if they are present in Western Australia in low enough numbers or in sufficiently limited areas that their eradication is still a possibility.	In relation to a category 2 declared pest, the owner or occupier of land in an area for which an organism is a declared pest or a person who is conducting an activity on the land must take such of the control measures specified in subregulation (1) as are reasonable and necessary to destroy, prevent or eradicate the declared pest.
C3 (Management) '(c) Category 3 (C3) — Management: if in the opinion of the Minister eradication of the declared pest from an area or part of an area for which it is declared is not feasible but that it is necessary to: (i) alleviate the harmful impact of the declared pest in the area; or (ii) reduce the number or distribution of the declared pest in the area; or (iii) prevent or contain the spread of the declared pest in the area.' Pests will be assigned to this category if they are established in Western Australia but it is feasible, or desirable, to manage them in order to limit their damage. Control measures can prevent a C3 pest from increasing in population size or density or moving from an area in which it is established into an area which currently is free of that pest.	In relation to a category 3 declared pest, the owner or occupier of land in an area for which an organism is a declared pest or a person who is conducting an activity on the land must take such of the control measures specified in subregulation (1) as are reasonable and necessary to: (a) alleviate the harmful impact of the declared pest in the area for which it is declared; or (b) reduce the number or distribution of the declared pest in the area for which it is declared; or (c) prevent or contain the spread of the declared pest in the area for which it is declared.

APPENDIX A4: OTHER DEFINITIONS

Environmentally sensitive areas

Environmentally sensitive areas are declared by the State Minister under section 51B of the *Environmental Protection Act 1986* (EP Act) and are listed in the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*, gazetted 8 April 2005. Specific environmentally sensitive areas relevant to this report include: a defined wetland and the area within 50 metres of the wetland; the area covered by vegetation within 50 metres of rare flora; the area covered by a threatened ecological community; a Bush Forever site – further areas and information are described in the *Environmental Protection (Environmentally Sensitive Areas) Notice 2005*.

Conservation significant flora

Under the *Environmental Factor Guideline: Flora and Vegetation* (EPA 2016b), flora may be considered significant for a range of reasons, including, but not limited to the following:

- being identified as threatened or priority species;
- locally endemic or associated with a restricted habitat type (e.g. surface water or groundwater dependent ecosystems);
- new species or anomalous features that indicate a potential new species;
- representative of the range of a species (particularly, at the extremes of range, recently discovered range extensions, or isolated outliers of the main range);
- unusual species, including restricted subspecies, varieties or naturally occurring hybrids; or
- relictual status, being representative of taxonomic groups that no longer occur widely in the broader landscape.

Conservation significant vegetation

Under the *Environmental Factor Guideline: Flora and Vegetation* (EPA 2016b), vegetation may be considered significant for a range of reasons, including, but not limited to the following:

- being identified as threatened or priority ecological communities;
- restricted distribution;
- degree of historical impact from threatening processes;
- a role as a refuge; or
- providing an important function required to maintain ecological integrity of a significant ecosystem.

APPENDIX A5: NVIS STRUCTURAL FORMATION TERMINOLOGY

Note: Adapted from ESCAVI (2003).

COVER CHARACTERISTICS							
Foliage cover*	70-100	30-70	10-30	<10	≈0	0-5	unknown
Crown cover**	>80	50-80	20-50	0.25-20	<0.25	0-5	unknown
% cover***	>80	50-80	20-50	0.25-20	<0.25	0-5	unknown
Cover code	d	c	i	r	bi	bc	unknown

GROWTH FORM	HEIGHT RANGES (m)	STRUCTURAL FORMATION CLASSES						
tree, palm	<10, 10-30, >30	closed forest	open forest	woodland	open woodland	isolated trees	isolated clumps of trees	trees
tree mallee	<3, <10, 10-30	closed mallee forest	open mallee forest	mallee woodland	open mallee woodland	isolated mallee trees	isolated clumps of mallee trees	mallee trees
shrub, cycad, grass-tree, tree-fern	<1, 1-2, >2	closed shrubland	shrubland	open shrubland	sparse shrubland	isolated shrubs	isolated clumps of shrubs	shrubs
mallee shrub	<3, <10, 10-30	closed mallee shrubland	mallee shrubland	open mallee shrubland	sparse mallee shrubland	isolated mallee shrubs	isolated clumps of mallee shrubs	mallee shrubs
heath shrub	<1, 1-2, >2	closed heathland	heathland	open heathland	sparse heathland	isolated heath shrubs	isolated clumps of heath shrubs	heath shrubs
chenopod shrub	<1, 1-2, >2	closed chenopod shrubland	chenopod shrubland	open chenopod shrubland	sparse chenopod shrubland	isolated chenopod shrubs	isolated clumps of chenopod shrubs	chenopod shrubs
samphire shrub	<0.5, >0.5	closed samphire shrubland	samphire shrubland	open samphire shrubland	spare samphire shrubland	isolated samphire shrubs	isolated clumps of samphire shrubs	samphire shrubs
hummock grass	<2, >2	closed hummock grassland	hummock grassland	open hummock grassland	sparse hummock grassland	isolated hummock grasses	isolated clumps of hummock grasses	hummock grasses
tussock grass	<0.5, >0.5	closed tussock grassland	tussock grassland	open tussock grassland	sparse tussock grassland	isolated tussock grassland	isolated clumps of tussock grasses	tussock grasses
other grass	<0.5, >0.5	closed grassland	grassland	open grassland	sparse grassland	isolated grasses	isolated clumps of grasses	other grasses
sedge	<0.5, >0.5	closed sedgeland	sedgeland	open sedgeland	sparse sedgeland	isolated sedges	isolated clumps of sedges	sedges
rush	<0.5, >0.5	closed rushland	rushland	open rushland	sparse rushland	isolated rushes	isolated clumps of rushes	rushes
forb	<0.5, >0.5	closed forbland	forbland	open forbland	sparse forbland	isolated forbs	isolated clumps of forbs	forbs
fern	<1, 1-2, >2	closed fernland	fernland	open fernland	sparse fernland	isolated ferns	isolated clumps of ferns	ferns
bryophyte	<0.5	closed bryophyte-land	Bryophyte-land	open bryophyte-land	sparse bryophyte-land	isolated bryophytes	isolated clumps of bryophytes	bryophytes
lichen	<0.5	closed lichenland	lichenland	open lichenland	sparse lichenland	isolated lichens	isolated clumps of lichens	lichens
vine	<10, 10-30, >30	closed vineland	vineland	open vineland	sparse vineland	isolated vines	isolated clumps of vines	vines
aquatic	0-0.5, <1	closed aquatic bed	aquatic bed	open aquatic bed	sparse aquatics	isolated aquatics	isolated clumps of aquatics	aquatics
seagrass	0-0.5, <1	closed seagrass bed	seagrass bed	open seagrass bed	sparse seagrasses	isolated seagrasses	isolated clumps of seagrasses	seagrasses

APPENDIX A6: DEFINITION OF VEGETATION CONDITION SCALE FOR THE SOUTH WEST AND INTERZONE BOTANICAL PROVINCES

Vegetation condition ratings relate to vegetation structure, level of disturbance at each structural layer and the ability of the vegetation unit to regenerate (Table 5.1). Vegetation condition provides complementary information for assessing the significance of potential impacts.

Table 6.1 Definition of Vegetation Condition Categories

Note: Adapted from Keighery (1994).

CATEGORY	DEFINITION
1 (Pristine)	Pristine or nearly so, no obvious sign of disturbance or damage caused by human activities since European settlement.
2 (Excellent)	Vegetation structure intact, disturbance affecting individual species, and weeds are non-aggressive species. Damage to trees caused by fire, the presence of non-aggressive weeds and occasional vehicle tracks.
3 (Very Good)	Vegetation structure altered obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and grazing.
4 (Good)	Vegetation structure significantly altered by obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and grazing.
5 (Degraded)	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds at high density, partial clearing, dieback and grazing.
6 (Completely Degraded)	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs.

APPENDIX B: SUMMARY OF POTENTIAL VASCULAR PLANT SPECIES AT CARAVEL COPPER PROJECT

Note: * denotes introduced species; T denotes threatened flora and P1-P4 denote priority flora species (DPaW 2019).

FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Aizoaceae	* *Cleretum papulosum* subsp. *papulosum*						x	
	Disphyma crassifolium subsp. *clavellatum*						x	
	Gunniopsis intermedia						x	
	Gunniopsis septifraga						x	
	* *Mesembryanthemum nodiflorum*						x	
Amaranthaceae	*Ptilotus declinatus*				x	x	x	
	Ptilotus divaricatus						x	x
	Ptilotus drummondii				x	x	x	
	Ptilotus drummondii var. drummondii							x
	Ptilotus gaudichaudii					x		
	Ptilotus holosericeus						x	
	Ptilotus humilis				x	x		
	Ptilotus polystachyus				x	x	x	x
	Ptilotus spathulatus					x	x	x
	Ptilotus stirlingii subsp. stirlingii							x
Anarthriaceae	*Lyginia imberbis*				x	x		x
Apiaceae	*Actinotus leucocephalus*				x	x		
	Actinotus superbus						x	
	Apium annuum						x	
	Daucus glochidiatus				x	x	x	
	Homalosciadium homalocarpum				x	x		
	Platysace cirrosa				x	x	x	x
	Platysace commutata					x		
	Platysace juncea						x	
	Platysace maxwellii						x	
	Xanthosia atkinsoniana				x	x		
	Xanthosia ciliata					x		
Apodanthaceae	*Pilostyles hamiltoniorum*						x	
Araliaceae	*Hydrocotyle alata*				x	x		
	Hydrocotyle callicarpa						x	
	Hydrocotyle diantha				x	x	x	
	Hydrocotyle intertexta				x	x	x	
	Hydrocotyle lemnoides	P4			x	x		
	Hydrocotyle rugulosa				x	x		
	Trachymene cyanopetala				x	x	x	x
	Trachymene ornata				x	x	x	
	Trachymene pilosa				x	x	x	
Asparagaceae	*Acanthocarpus canaliculatus*				x	x		
	Arthropodium curvipes						x	
	Arthropodium dyeri						x	
	Dichopogon capillipes				x	x	x	x
	Dichopogon fimbriatus							x
	* *Lachenalia flava*					x		
	Laxmannia omnifertilis				x	x		
	Laxmannia sessiliflora subsp. australis							x
	Laxmannia sessiliflora subsp. *drummondii*				x	x		
	Laxmannia sessiliflora subsp. *sessiliflora*					x		
	Laxmannia squarrosa				x	x		
	Lomandra effusa						x	

APPENDIX B: SUMMARY OF POTENTIAL VASCULAR PLANT SPECIES AT CARAVEL COPPER PROJECT

Note: * denotes introduced species; T denotes threatened flora and P1-P4 denote priority flora species (DPaW 2019).

FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Asparagaceae	*Lomandra integra*						x	
(Cont.)	*Lomandra micrantha* subsp. *micrantha*					x	x	
	Sowerbaea laxiflora				x	x	x	x
	Thysanotus arbuscula						x	
	Thysanotus asper						x	
	Thysanotus dichotomus				x			
	Thysanotus manglesianus				x	x	x	
	Thysanotus patersonii				x	x	x	
	Thysanotus rectantherus						x	
	Thysanotus sp. Twining Wheatbelt (N.H. Brittan 81/29)						x	
	Thysanotus sparteus				x	x	x	x
	Thysanotus teretifolius						x	
	Thysanotus thyrsoideus				x	x	x	
Asphodelaceae	*Bulbine semibarbata*						x	
Asteraceae	*Actinobole uliginosum*				x	x	x	
	Angianthus micropodioides	P3					x	
	Angianthus pygmaeus						x	
	Angianthus tomentosus						x	
	* *Arctotheca calendula*				x	x	x	
	Blennospora drummondii				x	x	x	
	Brachyscome bellidioides					x		
	Brachyscome glandulosa				x	x		
	Brachyscome iberidifolia				x	x	x	x
	Brachyscome perpusilla				x	x	x	x
	Calotis hispidula				x	x	x	
	* *Carthamus lanatus*					x		
	Cephalipterum drummondii						x	
	Cephalosorus carpesioides					x		
	Ceratogyne obionoides				x	x		
	* *Chrysanthemoides monilifera*			x				
	Cotula australis						x	
	* *Cotula bipinnata*				x	x	x	x
	* *Cotula coronopifolia*						x	
	Cotula cotuloides						x	
	Erymophyllum tenellum				x	x	x	
	* *Gazania rigens*				x	x		
	Gilberta tenuifolia						x	
	* *Glebionis segetum*							x
	Gnephosis angianthoides				x	x	x	
	Gnephosis multiflora	P3					x	
	Gnephosis tenuissima				x	x	x	
	Gnephosis tenuissima - drummondii complex				x	x		
	Gnephosis tridens						x	
	* *Gorteria personata*						x	x
	Helichrysum leucopsideum				x	x	x	
	Hyalochlamys globifera						x	
	Hyalosperma cotula				x	x		x
	Hyalosperma demissum				x	x		
	Hyalosperma glutinosum subsp. *glutinosum*						x	
	* *Hypochaeris glabra*				x	x	x	
	Lagenophora huegelii				x	x	x	
	Lawrencella davenportii				x	x		
	Lawrencella rosea				x	x	x	x

APPENDIX B: SUMMARY OF POTENTIAL VASCULAR PLANT SPECIES AT CARAVEL COPPER PROJECT

Note: * denotes introduced species; T denotes threatened flora and P1-P4 denote priority flora species (DPaW 2019).

FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Asteraceae (Cont.)	*Millotia eichleri*						x	
	Millotia tenuifolia				x	x		
	Millotia tenuifolia var. *tenuifolia*					x		
	* *Monoculus monstrosus*						x	
	Myriocephalus appendiculatus				x	x		
	Myriocephalus occidentalis				x	x		
	Olearia lehmanniana				x	x		
	Olearia paucidentata						x	
	Olearia rudis						x	x
	Olearia sp. Eremicola (Diels & Pritzel s.n. PERTH 00449628)						x	
	Panaetia lessonii				x	x	x	x
	Pithocarpa pulchella				x	x		
	Podolepis aristata subsp. *aristata*					x	x	x
	Podolepis gracilis						x	
	Podotheca angustifolia				x	x	x	
	Podotheca gnaphalioides				x	x	x	x
	Podotheca pritzelii	P3					x	
	Pogonolepis muelleriana						x	
	Pogonolepis stricta				x	x	x	
	Pseudognaphalium luteoalbum						x	
	Pterochaeta paniculata				x	x		
	Quinetia urvillei						x	
	Rhodanthe chlorocephala subsp. rosea							x
	Rhodanthe citrina					x	x	x
	Rhodanthe laevis				x	x	x	
	Rhodanthe manglesii						x	x
	Rhodanthe polycephala						x	
	Rhodanthe pygmaea						x	
	Schoenia cassiniana				x	x	x	
	Senecio glossanthus						x	
	Siloxerus humifusus						x	
	Siloxerus multiflorus				x	x	x	
	* *Sonchus oleraceus*						x	
	* *Symphyotrichum squamatum*				x	x		
	* *Tolpis barbata*					x		
	Trichocline spathulata							x
	* *Ursinia anthemoides*				x	x	x	
	* *Ursinia anthemoides* subsp. *anthemoides*				x	x	x	x
	* *Vellereophyton dealbatum*				x	x		
	Waitzia acuminata						x	
	Waitzia acuminata var. *acuminata*						x	
	Waitzia acuminata var. *albicans*					x		
	Waitzia nitida					x	x	
	Waitzia suaveolens				x	x		
Boraginaceae	* *Echium plantagineum*						x	
	Halgania anagalloides				x	x	x	
	Halgania lavandulacea				x	x		
	Halgania anagalloides var. Southern (A.E. Orchard 1609)							x
	Halgania sp. Wongan Hills (K.F. Kenneally 2393)						x	
	Heliotropium curassavicum				x	x		
Boryaceae	*Borya constricta*				x	x	x	
	Borya laciniata						x	

APPENDIX B: SUMMARY OF POTENTIAL VASCULAR PLANT SPECIES AT CARAVEL COPPER PROJECT

Note: * denotes introduced species; T denotes threatened flora and P1-P4 denote priority flora species (DPaW 2019).

FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Boryaceae	*Borya scirpoidea*				x	x		
(Cont.)	*Borya sphaerocephala*				x	x	x	x
Brassicaceae	* *Brassica tournefortii*						x	
	* *Carrichtera annua*			x				
	* *Lepidium bonariense*					x		
	Lepidium rotundum				x	x	x	x
	Menkea australis						x	
Campanulaceae	*Isotoma hypocrateriformis*				x			
	Isotoma pusilla					x		
	Lobelia cleistogamoides						x	
	* *Monopsis debilis*				x	x		
	* *Monopsis debilis* var. *depressa*						x	
	* *Wahlenbergia capensis*				x	x	x	x
	Wahlenbergia gracilenta						x	
Caryophyllaceae	* *Petrorhagia dubia*						x	
	* *Sagina apetala*						x	
	* *Spergula arvensis*				x	x		
	Spergularia marina						x	
Casuarinaceae	*Allocasuarina campestris*				x	x	x	
	Allocasuarina drummondiana						x	x
	Allocasuarina grevilleoides	P3			x	x		
	Allocasuarina huegeliana				x	x	x	
	Allocasuarina humilis				x		x	x
	Allocasuarina microstachya						x	
	Allocasuarina thuyoides				x	x		
	Casuarina obesa						x	
Celastraceae	*Psammomoya choretroides*				x	x	x	
	Stackhousia pubescens				x	x	x	x
	Tripterococcus brunonis				x	x		x
Centrolepidaceae	*Aphelia brizula*				x	x	x	
	Aphelia drummondii					x		
	Centrolepis alepyroides					x		
	Centrolepis aristata				x	x	x	
	Centrolepis caespitosa				x	x		
	Centrolepis cephaloformis						x	
	Centrolepis drummondiana						x	
	Centrolepis glabra				x	x		
	Centrolepis humillima				x	x	x	x
	Centrolepis pilosa				x	x	x	
	Centrolepis polygyna				x	x	x	
	Centrolepis sp. Kalannie (B.J. Lepschi et al. BJL 3517)						x	
Chenopodiaceae	*Atriplex codonocarpa*						x	
	Atriplex exilifolia						x	
	Atriplex holocarpa						x	
	Atriplex semibaccata				x	x	x	
	Atriplex semilunaris						x	
	Didymanthus roei						x	x
	Enchylaena lanata						x	

APPENDIX B: SUMMARY OF POTENTIAL VASCULAR PLANT SPECIES AT CARAVEL COPPER PROJECT

Note: * denotes introduced species; T denotes threatened flora and P1-P4 denote priority flora species (DPaW 2019).

FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Chenopodiaceae (Cont.)	*Enchylaena tomentosa*						x	
	Maireana amoena						x	
	Maireana brevifolia				x	x	x	
	Maireana enchylaenoides				x	x	x	
	Maireana georgei						x	
	Maireana marginata					x	x	
	Rhagodia acicularis	T	V	x			x	
	Rhagodia drummondii						x	
	Rhagodia preissii						x	
	Rhagodia preissii subsp. *preissii*						x	
	Rhagodia sp. Watheroo (R.J. Cranfield & P.J. Spencer 8183)						x	
	Roycea pycnophylloides	T	E	x				
	Roycea spinescens						x	
	Salicornia quinqueflora						x	
	Sclerolaena diacantha						x	
	Tecticornia doliiformis						x	
	Tecticornia halocnemoides						x	
	Tecticornia indica subsp. *bidens*						x	
	Tecticornia lepidosperma						x	
	Tecticornia leptoclada subsp. *inclusa*						x	
	Tecticornia lylei						x	
	Tecticornia moniliformis						x	
	Tecticornia pergranulata subsp. *pergranulata*						x	
	Tecticornia syncarpa						x	
Colchicaceae	*Burchardia bairdiae*				x	x		
	Burchardia congesta				x	x	x	x
	Wurmbea dioica subsp. *alba*				x	x	x	x
	Wurmbea drummondii				x	x		x
	Wurmbea pygmaea						x	
	Wurmbea tenella						x	
Convolvulaceae	*Wilsonia humilis*						x	
Crassulaceae	* *Crassula alata*						x	
	Crassula colorata						x	
	Crassula colorata var. *acuminata*						x	
	Crassula colorata var. *colorata*				x	x		x
	Crassula decumbens				x	x		
	Crassula decumbens var. *decumbens*				x	x		x
	Crassula exserta						x	x
	* *Crassula natans*				x	x		
	Crassula peduncularis				x	x		
Cupressaceae	*Callitris arenaria*						x	
	Callitris roei						x	
Cyperaceae	*Chorizandra enodis*				x	x		
	Chorizandra multiarticulata						x	
	Cyperus alterniflorus				x	x		
	* *Cyperus tenellus*				x	x		
	Eleocharis acuta					x		
	Eleocharis keigheryi	T	V	x	x	x		
	Gahnia drummondii						x	
	Isolepis cernua				x	x		

APPENDIX B: SUMMARY OF POTENTIAL VASCULAR PLANT SPECIES AT CARAVEL COPPER PROJECT

Note: * denotes introduced species; T denotes threatened flora and P1-P4 denote priority flora species (DPaW 2019).

FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Cyperaceae	*Isolepis congrua*						x	x
(Cont.)	* *Isolepis hystrix*				x	x		
	Isolepis marginata				x	x	x	
	Lepidosperma costale						x	
	Lepidosperma pruinosum				x	x	x	x
	Lepidosperma sanguinolentum						x	
	Lepidosperma tenue				x	x		
	Lepidosperma sp.				x	x	x	
	Lepidosperma sp. Meckering (R. Davis WW 27-32)	P3					x	
	Lepidosperma sp. P1 small head (M.D. Tindale 166A)					x	x	
	Mesomelaena preissii						x	x
	Mesomelaena pseudostygia				x	x		
	Mesomelaena stygia					x		
	Schoenus brevisetis				x	x		
	Schoenus capillifolius	P3			x	x		
	Schoenus clandestinus				x	x		
	Schoenus humilis					x		
	Schoenus latitans						x	
	Schoenus nanus				x	x	x	
	Schoenus natans	P4			x	x		
	Schoenus odontocarpus				x	x	x	
	Schoenus pennisetis	P3					x	
	Schoenus pleiostemoneus						x	
	Schoenus rigens				x	x		
	Schoenus sculptus				x	x		
	Schoenus sesquispiculus						x	
	Schoenus subflavus subsp. *subflavus*				x	x	x	
	Schoenus tenellus				x	x		
	Schoenus unispiculatus				x	x		
	Schoenus sp. smooth culms (K.R. Newbey 7823)						x	x
Dasypogonaceae	*Calectasia hispida*					x		
Dilleniaceae	*Hibbertia acerosa*				x	x	x	x
	Hibbertia commutata				x	x		x
	Hibbertia crassifolia						x	
	Hibbertia diamesogenos					x		
	Hibbertia exasperata						x	
	Hibbertia glomerosa var. *glomerosa*						x	
	Hibbertia hibbertioides var. hibbertioides							x
	Hibbertia hypericoides subsp. hypericoides							x
	Hibbertia lasiopus					x		x
	Hibbertia miniata	P4				x		
	Hibbertia potentilliflora						x	
	Hibbertia polystachya							x
	Hibbertia rupicola						x	
	Hibbertia spicata				x	x		
	Hibbertia striata					x	x	
Dioscoreaceae	*Dioscorea hastifolia*				x	x		
Droseraceae	*Drosera basifolia*						x	
	Drosera barbigera							x
	Drosera drummondii						x	
	Drosera glanduligera				x	x	x	

APPENDIX B: SUMMARY OF POTENTIAL VASCULAR PLANT SPECIES AT CARAVEL COPPER PROJECT

Note: * denotes introduced species; T denotes threatened flora and P1-P4 denote priority flora species (DPaW 2019).

FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Droseraceae	*Drosera heterophylla*				x	x	x	
(cont.)	*Drosera hirsuta*				x	x		x
	Drosera intricata							x
	Drosera macrantha						x	
	Drosera macrophylla				x	x	x	
	Drosera orbiculata	P1				x		
	Drosera pallida				x	x	x	
	Drosera porrecta				x	x		
	Drosera rosulata						x	
	Drosera spilos				x	x		x
	Drosera subhirtella				x	x	x	
	Drosera thysanosepala				x	x		
	Drosera zonaria				x	x		x
	Drosera sp. Branched styles (S.C. Coffey 193)				x	x	x	x
Ecdeiocoleaceae	*Ecdeiocolea monostachya*				x	x	x	
Elaeocarpaceae	*Tetratheca confertifolia*				x	x		x
	Tetratheca retrorsa	P3					x	
Ericaceae	*Andersonia gracilis*	T	E	x				
	Andersonia lehmanniana				x	x		
	Andersonia lehmanniana subsp. *lehmanniana*				x	x		
	Andersonia lehmanniana subsp. *pubescens*						x	
	Conostephium minus					x		
	Conostephium pendulum						x	
	Conostephium preissii					x		
	Dielsiodoxa leucantha				x	x		
	Dielsiodoxa leucantha subsp. *leucantha*				x	x		
	Leucopogon cinereus				x	x	x	
	Leucopogon oliganthus				x	x		
	Leucopogon pulchellus							x
	Leucopogon sprengelioides				x	x		
	Leucopogon sp. Avon (J. Buegge D34)						x	
	Leucopogon sp. Bolgart (M. Hislop & F. Hort MH2486)							x
	Leucopogon sp. Newdegate (M. Hislop 3585)				x	x	x	
	Lysinema pentapetalum						x	
	Styphelia caudata						x	
	Styphelia hamulosa						x	
	Styphelia serratifolia				x	x	x	x
	Styphelia tamminensis	P3					x	
Euphorbiaceae	*Ricinocarpos undulatus*					x		
	Ricinocarpos velutinus							x
	Stachystemon brachyphyllus					x		
Fabaceae	*Acacia acanthoclada* subsp. *acanthoclada*						x	
	Acacia acuaria						x	
	Acacia aculeiformis				x	x		
	Acacia acuminata				x	x	x	x
	Acacia acutata						x	
	Acacia aestivalis					x	x	
	Acacia alata var. *platyptera*	P4			x	x		
	Acacia anarthros	P3						x

APPENDIX B: SUMMARY OF POTENTIAL VASCULAR PLANT SPECIES AT CARAVEL COPPER PROJECT

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FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Fabaceae (Cont.)	*Acacia assimilis* subsp. *assimilis*						x	
	Acacia ataxiphylla subsp. *magna*	T	E	x				
	Acacia auronitens							x
	Acacia baxteri					x		x
	Acacia bidentata						x	x
	Acacia blakelyi				x	x	x	
	Acacia botrydion	P4					x	
	Acacia brumalis						x	x
	Acacia celastrifolia				x	x		
	Acacia cochlocarpa subsp. *cochlocarpa*	T	E	x			x	
	Acacia cochlocarpa subsp. *velutinosa*	T	CE	x				
	Acacia congesta subsp. *congesta*				x	x	x	
	Acacia congesta subsp. *wonganensis*	P2					x	
	Acacia coriacea subsp. *coriacea*						x	
	Acacia cummingiana	P3				x		
	Acacia cupularis						x	
	Acacia crassistipula							x
	Acacia dielsii						x	
	Acacia dilatata				x	x		
	Acacia drewiana subsp. *minor*	P2					x	
	Acacia drummondii subsp. affinis	P3						x
	Acacia drummondii subsp. candolleana							x
	Acacia drummondii subsp. *drummondii*				x	x		
	Acacia dura	P2					x	
	Acacia eremophila var. *eremophila*						x	
	Acacia ericifolia				x	x		
	Acacia ericksoniae				x	x	x	x
	Acacia erinacea				x	x	x	x
	Acacia erioclada						x	
	Acacia extensa				x			
	Acacia fauntleroyi						x	
	Acacia filifolia	P3					x	
	Acacia fragilis				x	x	x	
	Acacia gilbertii				x	x		
	Acacia hemiteles					x	x	
	Acacia heteroclita subsp. *heteroclita*				x	x		
	Acacia idiomorpha					x		
	Acacia incrassata				x	x		x
	Acacia jacksonioides				x	x	x	
	Acacia lasiocalyx				x	x	x	
	Acacia lasiocarpa var. bracteolata							x
	Acacia lasiocarpa var. *sedifolia*				x	x		
	Acacia latipes				x	x	x	
	Acacia latipes subsp. *latipes*				x	x		
	Acacia leptospermoides				x	x		
	Acacia leptospermoides subsp. *leptospermoides*						x	x
	Acacia ligustrina						x	
	Acacia lineolata subsp. *lineolata*						x	
	Acacia mackeyana						x	
	Acacia microbotrya				x	x	x	x
	Acacia multispicata				x	x	x	x
	Acacia nigripilosa				x	x		
	Acacia nigripilosa subsp. *nigripilosa*				x	x	x	
	Acacia orbifolia						x	
	Acacia phaeocalyx	P3					x	

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FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Fabaceae (Cont.)	*Acacia pharangites*	T	E				x	
	Acacia prainii						x	
	Acacia pulchella var. *glaberrima*				x	x	x	
	Acacia pulchella var. *goadbyi*					x		x
	* *Acacia pycnantha*						x	
	Acacia pygmaea	T	E	x			x	
	Acacia repanda	P3					x	
	Acacia restiacea				x	x	x	
	Acacia ridleyana	P3			x	x		
	Acacia saligna						x	
	Acacia saligna subsp. Wheatbelt (B.R. Maslin 8602)				x	x	x	
	Acacia saxatilis						x	
	Acacia scirpifolia						x	
	Acacia semicircinalis	P4					x	
	Acacia shuttleworthii				x	x	x	x
	Acacia sphacelata subsp. *sphacelata*					x		
	Acacia splendens	T	E	x	x	x		
	Acacia sulcata var. *platyphylla*						x	
	Acacia tratmaniana						x	
	Acacia trinalis	P1					x	
	Acacia ulicina						x	x
	Acacia vassalii	T	E	x			x	
	Acacia willdenowiana				x	x		x
	Acacia yorkrakinensis subsp. *acrita*						x	
	Acacia sp.						x	
	Acacia sp. Mullewa (B.R. Maslin 4269)						x	
	Acacia sp. New Norcia (E.A. Griffin 5917)	P1						x
	Bossiaea eriocarpa						x	x
	Bossiaea spinescens				x	x	x	x
	Chorizema aciculare subsp. *laxum*						x	x
	Chorizema genistoides						x	
	Chorizema humile	T	E	x				
	Chorizema racemosum					x		
	Chorizema rhynchotropis						x	
	Daviesia angulata				x			x
	Daviesia benthamii				x	x	x	x
	Daviesia daphnoides						x	
	Daviesia debilior subsp. *sinuans*					x		
	Daviesia decurrens subsp. *decurrens*				x	x		
	Daviesia dielsii	T	E	x				
	Daviesia euphorbioides	T	E	x			x	
	Daviesia hakeoides subsp. *subnuda*				x	x	x	
	Daviesia incrassata subsp. *incrassata*				x	x		
	Daviesia longifolia				x	x		
	Daviesia nematophylla						x	
	Daviesia nudiflora subsp. *drummondii*	P3					x	
	Daviesia nudiflora subsp. *nudiflora*						x	
	Daviesia polyphylla				x	x		
	Daviesia quadrilatera							x
	Daviesia spiralis	P4					x	
	Daviesia umbonata				x			
	Eutaxia leptophylla						x	
	Eutaxia parvifolia						x	x
	Gastrolobium axillare					x		
	Gastrolobium callistachys				x	x	x	

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FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Fabaceae (Cont.)	*Gastrolobium calycinum*				x	x	x	x
	Gastrolobium celsianum				x	x		
	Gastrolobium floribundum				x	x		
	Gastrolobium glaucum	T	E	x				
	Gastrolobium hamulosum	T	E	x			x	x
	Gastrolobium ilicifolium					x		
	Gastrolobium laytonii				x	x		
	Gastrolobium obovatum					x	x	x
	Gastrolobium parviflorum							x
	Gastrolobium plicatum				x	x		
	Gastrolobium polystachyum				x	x		x
	Gastrolobium rotundifolium	P3					x	x
	Gastrolobium spathulatum				x	x		
	Gastrolobium spinosum					x		x
	Gastrolobium stowardii						x	x
	Gastrolobium trilobum				x	x	x	
	Gompholobium capitatum					x		
	Gompholobium knightianum							x
	Gompholobium laxum							x
	Gompholobium shuttleworthii				x			x
	Gompholobium tomentosum					x	x	x
	Hovea pungens							x
	Hovea stricta					x		
	Hovea trisperma					x	x	
	Isotropis cuneifolia subsp. *cuneifolia*				x	x		x
	Isotropis drummondii						x	x
	Isotropis juncea				x	x	x	x
	Jacksonia angulata				x	x		
	Jacksonia condensata						x	x
	Jacksonia debilis	P1					x	
	Jacksonia epiphyllum					x		
	Jacksonia floribunda					x		x
	Jacksonia foliosa					x	x	
	Jacksonia hakeoides				x	x	x	x
	Jacksonia macrocalyx						x	
	Jacksonia nutans				x	x		
	Jacksonia restioides					x		x
	Jacksonia sternbergiana							x
	Kennedia prostrata						x	
	Labichea lanceolata subsp. *lanceolata*				x	x		
	Lotus cruentus						x	
	* *Melilotus indicus*						x	
	Mirbelia dilatata				x	x		
	Mirbelia floribunda				x	x	x	x
	Mirbelia ramulosa				x	x	x	x
	Mirbelia spinosa							x
	Mirbelia trichocalyx				x	x	x	x
	Senna artemisioides subsp. *filifolia*						x	
	Sphaerolobium medium							x
	Templetonia aculeata				x	x	x	
	Templetonia smithiana						x	
	Templetonia sulcata						x	
	* *Trifolium angustifolium*						x	
	* *Trifolium arvense* var. *arvense*						x	

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FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Fabaceae	* *Trifolium hirtum*				x	x		
(Cont.)	* *Trifolium repens*				x	x		
Frankeniaceae	*Frankenia conferta*	T	E	x				
	Frankenia glomerata	P4					x	
	Frankenia pauciflora						x	
	* *Frankenia pulverulenta*				x	x		
Gentianaceae	* *Centaurium tenuiflorum*					x		
	* *Cicendia filiformis*				x	x		
	Sebaea ovata				x	x	x	
Geraniaceae	* *Erodium aureum*						x	
	* *Erodium botrys*						x	
	Erodium cygnorum				x	x	x	
	Pelargonium havlasae				x	x	x	
Goodeniaceae	*Brunonia australis*						x	
	Dampiera alata							x
	Dampiera altissima				x	x		
	Dampiera coronata				x	x		
	Dampiera juncea						x	
	Dampiera lavandulacea				x	x	x	x
	Dampiera lindleyi					x	x	x
	Dampiera oligophylla						x	
	Dampiera spicigera				x	x	x	x
	Dampiera teres						x	
	Dampiera trigona				x	x		
	Dampiera wellsiana						x	
	Dampiera sp. Wongan Hills (R.D. Royce 6637)						x	
	Goodenia arthrotricha	T	E	x	x	x		
	Goodenia berardiana				x	x	x	
	Goodenia convexa					x	x	x
	Goodenia cycnopotamica				x	x	x	x
	Goodenia discophora						x	
	Goodenia drummondii subsp. *drummondii*						x	
	Goodenia glareicola						x	
	Goodenia hassallii							x
	Goodenia helmsii						x	
	Goodenia pinifolia						x	
	Goodenia pulchella				x	x		
	Goodenia pusilliflora					x	x	
	Goodenia reinwardtii				x		x	x
	Goodenia scapigera subsp. *scapigera*				x	x		
	Goodenia trinervis				x	x		x
	Lechenaultia biloba				x	x	x	x
	Lechenaultia floribunda							x
	Lechenaultia stenosepala				x	x		
	Scaevola calliptera				x	x		
	Scaevola glandulifera				x	x		x
	Scaevola hamiltonii						x	
	Scaevola humifusa						x	
	Scaevola lanceolata						x	x
	Scaevola phlebopetala							x
	Scaevola platyphylla				x	x	x	x
	Scaevola spinescens				x	x	x	

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FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Goodeniaceae	*Scaevola tortuosa*	P1					x	
(Cont.)	*Scaevola virgata*						x	
Haemodoraceae	*Anigozanthos bicolor* subsp. *bicolor*				x	x		
	Anigozanthos humilis				x			
	Anigozanthos humilis subsp. *chrysanthus*	P4			x	x	x	x
	Anigozanthos humilis subsp. *humilis*				x	x	x	x
	Conostylis aculeata				x	x		
	Conostylis aculeata subsp. *aculeata*				x			
	Conostylis aculeata subsp. *bromelioides*						x	
	Conostylis aculeata subsp. *spinuligera*				x	x		
	Conostylis androstemma				x	x	x	
	Conostylis aurea					x		x
	Conostylis crassinerva subsp. *absens*				x	x		
	Conostylis prolifera				x	x	x	x
	Conostylis setigera subsp. *setigera*				x	x	x	
	Conostylis teretiuscula				x	x		
	Conostylis villosa						x	x
	Conostylis wonganensis	T	E	x	x	x	x	
	Haemodorum discolor				x	x		
	Haemodorum paniculatum				x	x		
	Haemodorum simplex				x	x		
	Haemodorum simulans							x
	Haemodorum spicatum				x			
	Haemodorum venosum							x
	Macropidia fuliginosa				x	x		
	Tribonanthes australis				x	x		
	Tribonanthes longipetala				x	x	x	x
	Tribonanthes violacea				x	x		
Haloragaceae	*Glischrocaryon angustifolium*						x	
	Glischrocaryon aureum				x	x	x	x
	Glischrocaryon flavescens						x	
	Gonocarpus nodulosus				x	x	x	
	Haloragis platycarpa	T	CE	x		x		
	Myriophyllum drummondii					x		
Hemerocallidaceae	*Arnocrinum preissii*				x	x		
	Caesia micrantha				x	x	x	
	Caesia sp. Wongan (K.F. Kenneally 8820)					x	x	
	Chamaescilla corymbosa				x	x		
	Chamaescilla corymbosa var. *corymbosa*						x	x
	Chamaescilla versicolor					x		
	Corynotheca micrantha				x	x		
	Dianella revoluta						x	x
	Dianella revoluta var. divaricata							x
	Stypandra glauca				x	x	x	x
	Tricoryne tenella						x	
Hydatellaceae	*Trithuria bibracteata*				x	x		
	Trithuria submersa				x	x		
Hypericaceae	*Hypericum japonicum*				x	x		

APPENDIX B: SUMMARY OF POTENTIAL VASCULAR PLANT SPECIES AT CARAVEL COPPER PROJECT

Note: * denotes introduced species; T denotes threatened flora and P1-P4 denote priority flora species (DPaW 2019).

FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Hypoxidaceae	*Pauridia glabella* var. *glabella*				x	x	x	
	Pauridia occidentalis				x	x		
	Pauridia occidentalis var. *occidentalis*				x	x		x
Iridaceae	* *Chasmanthe floribunda*							x
	* *Moraea lewisiae*				x	x		
	* *Moraea miniata*						x	
	* *Moraea setifolia*						x	x
	Orthrosanthus laxus				x	x		x
	Orthrosanthus laxus var. *gramineus*				x	x	x	x
	Orthrosanthus laxus var. *laxus*						x	x
	Patersonia juncea					x		
	Patersonia occidentalis				x	x		
	Patersonia occidentalis var. *occidentalis*					x		
	* *Romulea rosea*				x	x	x	
	* *Romulea rosea* var. *australis*				x	x		
Isoetaceae	*Isoetes australis*						x	
	Isoetes caroli						x	
	Isoetes drummondii					x		
Juncaceae	* *Juncus acutus*							x
	* *Juncus bufonius*				x	x	x	
	* *Juncus capitatus*				x	x		
	Juncus pauciflorus				x	x		
	Juncus radula						x	
	Juncus subsecundus				x	x		
Juncaginaceae	*Triglochin isingiana*				x	x		x
	Triglochin minutissima				x	x	x	
	Triglochin mucronata						x	
	Triglochin nana				x	x	x	
	Triglochin stowardii				x	x		
Lamiaceae	*Cyanostegia angustifolia*						x	
	Dasymalla axillaris	T	CE	x			x	
	Dasymalla terminalis						x	
	Dicrastylis velutina	P3					x	
	Hemiandra coccinea	P3					x	
	Hemiandra gardneri	T	E	x				
	Hemiandra glabra					x		
	Hemiandra incana				x	x	x	x
	Hemigenia argentea						x	
	Hemigenia botryphylla						x	
	Hemigenia dielsii						x	
	Hemigenia incana					x		
	Hemigenia sericea						x	
	Hemigenia viscida						x	
	Hemigenia westringioides						x	
	Lachnostachys ferruginea					x	x	x
	Microcorys barbata				x	x		
	Microcorys eremophiloides	T	V	x			x	
	Microcorys longifolia					x		x
	Microcorys obovata					x	x	
	Prostanthera eckersleyana						x	

APPENDIX B: SUMMARY OF POTENTIAL VASCULAR PLANT SPECIES AT CARAVEL COPPER PROJECT

Note: * denotes introduced species; T denotes threatened flora and P1-P4 denote priority flora species (DPaW 2019).

FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Lamiaceae	*Quoya dilatata*				x	x		x
(Cont.)	*Teucrium sessiliflorum*						x	
	Westringia rigida						x	
Lauraceae	*Cassytha aurea*				x	x		
	Cassytha aurea var. *hirta*						x	
	Cassytha glabella				x	x		
	Cassytha glabella forma casuarinae				x	x		
	Cassytha glabella forma glabella						x	
	Cassytha melantha						x	
	Cassytha pomiformis				x	x		x
	Cassytha racemosa				x	x		
Lentibulariaceae	*Utricularia multifida*				x	x		
	Utricularia tenella							x
	Utricularia violacea				x	x		
Linaceae	*Linum marginale*						x	
Loganiaceae	*Orianthera flaviflora*						x	
	Orianthera spermacocea				x	x		x
	Phyllangium paradoxum						x	
	Phyllangium sulcatum						x	
Loranthaceae	*Amyema miraculosa* subsp. *miraculosa*						x	
	Amyema preissii				x			x
	Nuytsia floribunda							x
Macarthuriaceae	*Macarthuria australis*				x	x		
Malvaceae	*Androcalva pulchella*						x	
	Guichenotia impudica	P3					x	x
	Guichenotia macrantha				x	x	x	x
	Guichenotia micrantha				x	x	x	x
	Guichenotia sarotes				x	x	x	x
	Guichenotia tuberculata	P3			x	x		x
	Lasiopetalum cenobium	P1						x
	Lasiopetalum glutinosum subsp. *latifolium*					x		x
	Lasiopetalum molle						x	
	Lawrencia diffusa						x	
	Lawrencia squamata						x	
	Lysiosepalum abollatum	T	CE	x			x	
	Lysiosepalum hexandrum						x	
	Lysiosepalum rugosum						x	
	Seringia hermanniifolia				x	x		
	Seringia integrifolia						x	x
	Seringia velutina						x	x
	Thomasia foliosa				x	x	x	
	Thomasia grandiflora				x	x		
	Thomasia macrocalyx							x
	Thomasia rugosa						x	
	Thomasia tenuivestita	P3					x	
	Thomasia sp. Green Hill (S. Paust 1322)	T	E	x				x
Menyanthaceae	*Liparophyllum capitatum*				x	x		

APPENDIX B: SUMMARY OF POTENTIAL VASCULAR PLANT SPECIES AT CARAVEL COPPER PROJECT

Note: * denotes introduced species; T denotes threatened flora and P1-P4 denote priority flora species (DPaW 2019).

FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Montiaceae	*Calandrinia calyptrata*				x	x	x	
	Calandrinia eremaea						x	
	Calandrinia granulifera						x	
	Calandrinia lehmannii				x	x		
	Calandrinia uncinella	P1					x	
	Calandrinia wilsonii	P2					x	
	Calandrinia sp. Kenwick (G.J. Keighery 10905)				x	x		
	Calandrinia sp. Needilup (K.R. Newbey 4892)						x	
Myrtaceae	*Aluta aspera* subsp. *hesperia*						x	
	Babingtonia camphorosmae							x
	Babingtonia grandiflora				x	x		x
	Baeckea muricata						x	
	Baeckea sp. Dudawa (M.E. Trudgen MET 5369)						x	
	Beaufortia aestiva				x	x	x	
	Beaufortia elegans					x		
	Beaufortia eriocephala	P3			x	x		x
	Beaufortia puberula				x	x	x	
	Calothamnus accedens	P4				x		
	Calothamnus hirsutus				x	x	x	
	Calothamnus longissimus					x		
	Calothamnus pachystachyus	P4			x	x		x
	Calothamnus quadrifidus subsp. *angustifolius*						x	
	Calothamnus quadrifidus subsp. *asper*	P2					x	
	Calothamnus quadrifidus subsp. *quadrifidus*					x	x	x
	Calothamnus sanguineus				x	x	x	x
	Calytrix angulata				x		x	x
	Calytrix aurea							x
	Calytrix breviseta subsp. *stipulosa*					x	x	x
	Calytrix cravenii						x	x
	Calytrix depressa				x	x	x	
	Calytrix fraseri				x	x		
	Calytrix glutinosa				x	x	x	x
	Calytrix gracilis				x	x	x	
	Calytrix leschenaultii				x	x	x	
	Calytrix sapphirina				x	x	x	
	Calytrix strigosa				x	x		x
	Chamelaucium brevifolium						x	
	Chamelaucium ciliatum				x	x		
	Chamelaucium drummondii subsp. *drummondii* ms				x	x	x	
	Chamelaucium sp. Wongan Hills (B.H. Smith 1140)	P3			x	x	x	
	Cyathostemon heterantherus						x	
	Darwinia acerosa	T	E	x	x	x		
	Darwinia carnea	T	E		x	x		
	Darwinia pinifolia					x		
	Darwinia sp. Karonie (K. Newbey 8503)						x	
	Enekbatus sessilis						x	
	Eremaea beaufortioides				x	x		
	Eremaea fimbriata					x		
	Eremaea pauciflora						x	x
	Eremaea pauciflora var. lonchophylla					x		
	Ericomyrtus drummondii						x	
	Ericomyrtus serpyllifolia				x	x	x	x
	Ericomyrtus tenuior				x	x		x
	Eucalyptus arachnaea					x	x	

APPENDIX B: SUMMARY OF POTENTIAL VASCULAR PLANT SPECIES AT CARAVEL COPPER PROJECT

Note: * denotes introduced species; T denotes threatened flora and P1-P4 denote priority flora species (DPaW 2019).

FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Myrtaceae (Cont.)	*Eucalyptus arachnaea* subsp. *arachnaea*				x	x	x	x
	Eucalyptus armillata						x	x
	Eucalyptus comitae-vallis						x	
	Eucalyptus decipiens					x		
	Eucalyptus dolichocera						x	
	Eucalyptus drummondii				x	x	x	
	Eucalyptus ebbanoensis subsp. *ebbanoensis*						x	
	Eucalyptus eudesmioides				x	x	x	
	Eucalyptus flocktoniae				x	x	x	
	Eucalyptus flocktoniae subsp. *flocktoniae*				x	x		
	Eucalyptus gittinsii				x	x		
	Eucalyptus gittinsii subsp. *illucida*				x	x		
	Eucalyptus horistes				x	x		
	Eucalyptus leprophloia	T	E	x				
	Eucalyptus longicornis						x	
	Eucalyptus loxophleba						x	
	Eucalyptus loxophleba subsp. *loxophleba*				x	x	x	x
	Eucalyptus macrocarpa subsp. *macrocarpa*						x	x
	Eucalyptus macrocarpa x pyriformis	P3					x	x
	Eucalyptus moderata						x	x
	Eucalyptus obtusiflora				x	x	x	
	Eucalyptus orthostemon				x	x	x	x
	Eucalyptus phenax subsp. *phenax*						x	x
	Eucalyptus pileata						x	x
	Eucalyptus pruiniramis	T	E	x	x	x		
	Eucalyptus pyriformis						x	
	Eucalyptus recta	T	E	x				
	Eucalyptus redunca subsp. *pluricaulis*				x	x	x	
	Eucalyptus rigidula						x	x
	Eucalyptus rudis							x
	Eucalyptus salmonophloia				x	x	x	
	Eucalyptus sargentii subsp. *onesis*	P3					x	x
	Eucalyptus subangusta subsp. *pusilla*						x	x
	Eucalyptus subangusta subsp. *subangusta*						x	x
	Eucalyptus todtiana							x
	Eucalyptus virella					x	x	x
	Eucalyptus wandoo				x	x	x	
	Eucalyptus wandoo subsp. *pulverea*				x	x		
	Eucalyptus wandoo subsp. *wandoo*				x	x	x	x
	Eucalyptus yilgarnensis						x	
	Eucalyptus x carnabyi	P4				x	x	
	Homalocalyx thryptomenoides						x	
	Hypocalymma angustifolium						x	x
	Hypocalymma puniceum						x	
	Kunzea micrantha						x	
	Kunzea praestans					x		
	Kunzea pulchella						x	
	Leptospermum erubescens				x	x	x	x
*	*Leptospermum laevigatum*				x	x		
	Leptospermum oligandrum							x
	Leptospermum roei						x	
	Melaleuca acuminata subsp. *websteri*						x	
	Melaleuca adnata						x	
	Melaleuca aspalathoides				x	x		x
	Melaleuca caeca				x	x		

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FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Myrtaceae (Cont.)	*Melaleuca carrii*				x	x	x	
	Melaleuca concreta						x	x
	Melaleuca conothamnoides				x	x	x	
	Melaleuca delta						x	
	Melaleuca fulgens subsp. *steedmanii*				x	x		
	Melaleuca halmaturorum						x	
	Melaleuca hamata				x	x	x	
	Melaleuca hamulosa						x	
	Melaleuca lanceolata						x	
	Melaleuca lateriflora						x	
	Melaleuca lateritia				x	x		
	Melaleuca laxiflora						x	
	Melaleuca lecanantha						x	
	Melaleuca leptospermoides				x	x		
	Melaleuca marginata				x	x	x	x
	Melaleuca megacephala				x	x		
	Melaleuca orbicularis				x	x	x	x
	Melaleuca parviceps				x	x		
	Melaleuca platycalyx						x	x
	Melaleuca pungens						x	
	Melaleuca radula				x	x	x	x
	Melaleuca rhaphiophylla				x	x		
	Melaleuca ryeae				x	x		
	Melaleuca scalena						x	
	Melaleuca sciotostyla	T	E	x			x	
	Melaleuca sclerophylla	P3				x	x	x
	Melaleuca seriata				x	x		
	Melaleuca spicigera						x	
	Melaleuca teretifolia				x	x		
	Melaleuca trichophylla				x	x		
	Melaleuca tuberculata var. *tuberculata*						x	
	Melaleuca viminea							x
	Melaleuca viminea subsp. *viminea*				x	x		
	Melaleuca vinnula						x	
	Micromyrtus racemosa						x	
	Micromyrtus rogeri	P1				x		
	Micromyrtus triptycha subsp. Maya (B.L. Rye & M.E. Trudgen 239104)						x	
	Pericalymma spongiocaule					x		
	Pileanthus peduncularis subsp. *peduncularis*						x	
	Regelia megacephala	P4				x		
	Scholtzia capitata						x	
	Scholtzia drummondii						x	
	Scholtzia halophila subsp. *halophila*						x	
	Scholtzia involucrata				x	x		
	Scholtzia parviflora				x	x		
	Scholtzia uniovulata						x	
	Tetrapora floribunda						x	
	Thryptomene australis subsp. *australis*						x	
	Thryptomene costata						x	
	Thryptomene denticulata						x	
	Thryptomene mucronulata				x	x	x	
	Thryptomene racemulosa						x	x
	Verticordia acerosa var. *preissii*				x	x	x	
	Verticordia brachypoda						x	

APPENDIX B: SUMMARY OF POTENTIAL VASCULAR PLANT SPECIES AT CARAVEL COPPER PROJECT

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FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Myrtaceae	*Verticordia chrysantha*						x	x
(Cont.)	*Verticordia chrysanthella*				x	x	x	x
	Verticordia densiflora var. *cespitosa*						x	x
	Verticordia densiflora var. *densiflora*				x	x		x
	Verticordia drummondii						x	
	Verticordia endlicheriana var. *compacta*						x	
	Verticordia eriocephala				x		x	x
	Verticordia huegelii var. *stylosa*				x	x		
	Verticordia huegelii var. *tridens*	P3			x	x		x
	Verticordia insignis subsp. eomagis	P3						x
	Verticordia insignis Endl. subsp. insignis							x
	Verticordia lindleyi subsp. *lindleyi*	P4			x	x		
	Verticordia monadelpha var. *monadelpha*						x	x
	Verticordia muelleriana subsp. *muelleriana*	P3				x		
	Verticordia nobilis					x		
	Verticordia paludosa				x	x		
	Verticordia patens				x	x		
	Verticordia pennigera				x	x	x	x
	Verticordia picta				x	x	x	x
	Verticordia plumosa var. *incrassata*						x	
	Verticordia pritzelii						x	
	Verticordia rutilastra							x
	Verticordia serrata var. ciliata							x
	Verticordia staminosa subsp. *staminosa*	T	E	x			x	
	Verticordia venusta	P3					x	
	Verticordia wonganensis						x	
Ophioglossaceae	*Ophioglossum lusitanicum*				x	x	x	
Orchidaceae	*Caladenia denticulata*				x	x	x	
	Caladenia dimidia				x	x		
	Caladenia discoidea				x	x		
	Caladenia dundasiae	P1				x		
	Caladenia drakeoides	T	E	x				
	Caladenia exilis subsp. *vanleeuwenii*				x	x		
	Caladenia filifera							x
	Caladenia flava						x	
	Caladenia flava subsp. *flava*				x	x		x
	Caladenia footeana				x	x	x	
	Caladenia hirta subsp. hirta							x
	Caladenia hirta subsp. *rosea*				x	x		x
	Caladenia longicauda				x	x		
	Caladenia longicauda subsp. eminens							x
	Caladenia longicauda subsp. *borealis*				x	x		
	Caladenia longicauda subsp. *longicauda*						x	x
	Caladenia nobilis				x	x		
	Caladenia paradoxa						x	
	Caladenia pendens subsp. *pendens*						x	x
	Caladenia sp.				x	x		
	Caladenia varians				x	x		
	Diuris brachyscapa						x	
	Diuris brumalis				x	x		x
	Diuris carinata						x	
	Diuris corymbosa				x	x	x	
	Diuris laxiflora				x	x		

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FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Orchidaceae (Cont.)	*Diuris perialla*				x	x		
	Diuris picta						x	
	Diuris refracta				x	x	x	
	Diuris septentrionalis				x	x		
	Diuris setacea				x	x		x
	Elythranthera brunonis				x	x	x	x
	Elythranthera emarginata						x	x
	Ericksonella saccharata				x	x		
	Eriochilus dilatatus subsp. *undulatus*				x	x		
	Leptoceras menziesii				x	x		
	Microtis media					x		
	Paracaleana nigrita				x	x		
	Pheladenia deformis					x		x
	Prasophyllum cyphochilum				x	x	x	
	Prasophyllum elatum				x	x		
	Prasophyllum gracile				x	x	x	x
	Prasophyllum hians				x	x		
	Prasophyllum macrostachyum				x	x		
	Prasophyllum macrotys				x	x		
	Pterostylis dilatata						x	
	Pterostylis ectypha				x	x		
	Pterostylis orbiculata							x
	Pterostylis recurva				x		x	
	Pterostylis sanguinea						x	x
	Pterostylis sargentii					x	x	
	Pterostylis scabra						x	
	Pterostylis scitula				x	x		
	Pterostylis setulosa						x	
	Pterostylis vittata				x	x		x
	Thelymitra antennifera				x	x	x	x
	Thelymitra stellata	T	E	x				
	Thelymitra vulgaris				x	x		
Orobanchaceae	* *Bellardia trixago*					x		
	* *Orobanche minor*						x	
	* *Parentucellia latifolia*						x	
Oxalidaceae	* *Oxalis corniculata*						x	
	Oxalis exilis				x	x	x	
	Oxalis perennans						x	
Papaveraceae	* *Fumaria capreolata*				x	x		
Philydraceae	*Philydrella drummondii*					x		
Phrymaceae	*Glossostigma diandrum*					x		
	Glossostigma drummondii						x	
Phyllanthaceae	*Phyllanthus calycinus*				x	x		
Pittosporaceae	*Billardiera fusiformis*						x	
	Billardiera venusta				x	x	x	
	Cheiranthera preissiana							x
	Marianthus bicolor						x	

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FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Pittosporaceae	*Marianthus erubescens*						x	x
(Cont.)	*Pittosporum angustifolium*						x	
Plantaginaceae	*Gratiola pubescens*				x	x		
	* *Kickxia elatine subsp. crinita*							x
	Plantago debilis				x	x		
	Plantago exilis				x	x		
Poaceae	* *Aira caryophyllea*						x	
	* *Aira cupaniana*						x	
	Amphibromus nervosus				x	x		
	Amphipogon caricinus				x	x		
	Amphipogon caricinus var. *caricinus*						x	
	Amphipogon debilis						x	
	Amphipogon strictus					x		
	Amphipogon turbinatus				x	x		
	Aristida contorta				x	x	x	
	* *Aristida ramosa*				x	x		
	Austrostipa elegantissima				x	x	x	
	Austrostipa flavescens							x
	Austrostipa eremophila					x	x	
	Austrostipa exilis						x	
	Austrostipa hemipogon							x
	Austrostipa nitida						x	
	Austrostipa scabra						x	
	Austrostipa tenuifolia						x	x
	Austrostipa trichophylla						x	
	Austrostipa variabilis				x	x	x	
	* *Avellinia festucoides*						x	
	* *Avena barbata*						x	
	* *Avena fatua*						x	
	* *Avena sativa*						x	
	* *Avena strigosa*						x	
	* *Briza maxima*				x	x	x	
	* *Briza minor*				x	x		
	Bromus arenarius						x	
	* *Bromus diandrus*						x	
	* *Bromus madritensis*						x	
	* *Bromus rubens*						x	x
	* *Cenchrus ciliaris*			x				
	Chloris truncata					x		
	* *Corynephorus fasciculatus*				x	x		
	Cymbopogon obtectus					x		
	* *Cynodon dactylon*					x		
	* *Ehrharta calycina*						x	
	* *Ehrharta longiflora*				x	x	x	
	* *Eragrostis cilianensis*							x
	Eriachne ovata						x	
	Ericksonella saccharata							x
	* *Gastridium phleoides*					x		
	Glyceria drummondii	T	E	x	x	x		
	Lachnagrostis filiformis				x	x		
	Lachnagrostis plebeia				x	x		
	* *Lolium rigidum*				x	x	x	

APPENDIX B: SUMMARY OF POTENTIAL VASCULAR PLANT SPECIES AT CARAVEL COPPER PROJECT

Note: * denotes introduced species; T denotes threatened flora and P1-P4 denote priority flora species (DPaW 2019).

FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Poaceae (Cont.)	* *Lolium* sp.						x	
	Monachather paradoxus						x	
	Neurachne alopecuroidea				x	x	x	
	* *Parapholis incurva*				x	x	x	
	Phalaris minor					x		
	* *Pentameris airoides* subsp. *airoides*						x	
	* *Pentameris pallida*					x		
	* *Polypogon monspeliensis*						x	
	* *Rostraria cristata*						x	
	Rytidosperma caespitosum				x	x	x	
	Rytidosperma setaceum						x	
	Rytidosperma sp. Goomalling (A.G. Gunness et al. OAKP 10/63)						x	
	* *Secale cereale*							x
	Spartochloa scirpoidea						x	
	Tragus australianus						x	
	Triodia danthonioides				x	x		
	* *Triticum aestivum*					x		
	* *Vulpia muralis*						x	
	* *Vulpia myuros*				x	x	x	
	* *Vulpia myuros forma myuros*						x	x
	* *Vulpia* sp.						x	
Polygalaceae	*Comesperma acerosum*							x
	Comesperma integerrimum						x	
	Comesperma volubile				x	x	x	x
Polygonaceae	*Muehlenbeckia adpressa*						x	
	* *Rumex hypogaeus*				x	x		
	* *Rumex vesicarius*						x	
Potamogetonaceae	*Althenia australis*				x	x		
Primulaceae	* *Lysimachia arvensis*						x	
	Samolus repens var. floribundus							x
Proteaceae	*Adenanthos cygnorum subsp. cygnorum*							x
	Adenanthos drummondii				x	x	x	
	Banksia bella	P4					x	
	Banksia bipinnatifida subsp. *multifida*				x	x		
	Banksia burdettii				x	x		
	Banksia carlinoides					x		x
	Banksia comosa	P4					x	
	Banksia echinata				x	x		x
	Banksia fraseri var. *fraseri*				x	x	x	x
	Banksia fuscobractea	T	CE	x	x	x		
	Banksia hewardiana					x		x
	Banksia kippistiana				x	x		
	Banksia kippistiana var. *kippistiana*				x	x		x
	Banksia kippistiana var. *paenepeccata*	P3			x	x		
	Banksia leptophylla var. *leptophylla*				x	x		
	Banksia nivea subsp. *nivea*				x	x		
	Banksia nobilis subsp. *nobilis*				x	x		
	Banksia platycarpa					x		
	Banksia polycephala							x

APPENDIX B: SUMMARY OF POTENTIAL VASCULAR PLANT SPECIES AT CARAVEL COPPER PROJECT

Note: * denotes introduced species; T denotes threatened flora and P1-P4 denote priority flora species (DPaW 2019).

FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Proteaceae (Cont.)	*Banksia prionotes*				x		x	
	Banksia pteridifolia subsp. *vernalis*	P3			x	x		
	Banksia purdieana					x	x	x
	Banksia serratuloides subsp. *serratuloides*	T	V	x	x	x		x
	Banksia sessilis				x			
	Banksia sphaerocarpa var. pumilio							x
	Banksia sphaerocarpa var. *sphaerocarpa*				x	x		
	Banksia squarrosa subsp. squarrosa							x
	Banksia wonganensis	P4					x	
	Banksia sp.				x	x		
	Conospermum brownii						x	
	Conospermum densiflorum subsp. *unicephalatum*	T	E	x	x	x		
	Conospermum ephedroides						x	x
	Conospermum polycephalum				x	x	x	
	Conospermum stoechadis				x	x	x	x
	Conospermum stoechadis subsp. sclerophyllum							x
	Conospermum stoechadis subsp. *stoechadis*						x	x
	Grevillea acrobotrya						x	
	Grevillea armigera						x	
	Grevillea biformis subsp. *biformis*						x	
	Grevillea bipinnatifida subsp. *bipinnatifida*				x	x		
	Grevillea biternata				x	x		x
	Grevillea bracteosa							x
	Grevillea bracteosa subsp. *bracteosa*	T	-		x	x		x
	Grevillea curviloba	T	E	x				
	Grevillea didymobotrya subsp. *didymobotrya*						x	
	Grevillea drummondii	P4			x	x		x
	Grevillea dryandroides subsp. *dryandroides*	T	E	x				
	Grevillea dryandroides subsp. *hirsuta*	T	E	x				
	Grevillea endlicheriana				x	x	x	
	Grevillea eriostachya				x			
	Grevillea eryngioides						x	
	Grevillea excelsior						x	
	Grevillea florida	P3			x			
	Grevillea hakeoides subsp. *hakeoides*						x	x
	Grevillea hakeoides subsp. *stenophylla*						x	
	Grevillea kenneallyi	P2					x	
	Grevillea paniculata				x	x	x	x
	Grevillea petrophiloides						x	
	Grevillea petrophiloides subsp. *petrophiloides*						x	x
	Grevillea pilulifera				x	x		
	Grevillea pythara	T	E	x				
	Grevillea shuttleworthiana subsp. *shuttleworthiana*						x	
	Grevillea spinosissima						x	
	Grevillea synapheae subsp. synapheae							x
	Grevillea teretifolia						x	
	Grevillea umbellulata				x	x	x	x
	Grevillea uncinulata						x	x
	Grevillea sp. Gillingarra (R.J. Cranfield 4087)	T	CE	x	x	x		
	Hakea anadenia						x	
	Hakea auriculata				x	x		
	Hakea chromatropa	P1					x	x
	Hakea circumalata				x	x	x	
	Hakea commutata						x	
	Hakea conchifolia					x		

APPENDIX B: SUMMARY OF POTENTIAL VASCULAR PLANT SPECIES AT CARAVEL COPPER PROJECT

Note: * denotes introduced species; T denotes threatened flora and P1-P4 denote priority flora species (DPaW 2019).

FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Proteaceae (Cont.)	*Hakea costata*				x	x		
	Hakea cygnus subsp. *cygnus*						x	x
	Hakea erinacea				x	x		x
	Hakea gilbertii				x	x	x	x
	Hakea incrassata					x	x	x
	Hakea invaginata				x	x		
	Hakea lissocarpha				x	x	x	x
	Hakea marginata				x	x		x
	Hakea multilineata						x	
	Hakea neospathulata							x
	Hakea petiolaris subsp. *trichophylla*						x	
	Hakea platysperma						x	
	Hakea preissii					x	x	x
	Hakea prostrata							x
	Hakea recurva subsp. *recurva*						x	
	Hakea scoparia subsp. *scoparia*						x	
	Hakea trifurcata				x	x		
	Isopogon adenanthoides				x	x		
	Isopogon divergens				x	x	x	x
	Isopogon dubius						x	x
	Isopogon linearis					x		
	Isopogon panduratus				x	x		
	Isopogon scabriusculus subsp. *scabriusculus*						x	
	Isopogon teretifolius				x	x		
	Persoonia pungens	P3					x	
	Persoonia rudis	P3			x	x		
	Persoonia rufiflora				x	x		
	Persoonia stricta						x	
	Persoonia sulcata	P4			x	x		
	Persoonia trinervis				x	x		
	Petrophile biternata	P3			x	x		x
	Petrophile brevifolia				x	x		x
	Petrophile clavata	P2						x
	Petrophile divaricata					x		
	Petrophile drummondii							x
	Petrophile incurvata						x	
	Petrophile linearis				x	x		
	Petrophile macrostachya							x
	Petrophile plumosa	P3			x	x		
	Petrophile recurva					x		
	Petrophile seminuda						x	
	Petrophile serruriae							x
	Petrophile shuttleworthiana						x	
	Petrophile striata				x	x		
	Petrophile wonganensis						x	
	Stirlingia abrotanoides						x	
	Stirlingia latifolia				x	x		x
	Synaphea acutiloba				x	x		
	Synaphea aephynsa				x	x		
	Synaphea constricta	P3					x	
	Synaphea grandis	P4						x
	Synaphea interioris				x	x	x	
	Synaphea rangiferops	P2			x	x		
	Synaphea sparsiflora	P2			x	x		
	Synaphea spinulosa				x	x		

APPENDIX B: SUMMARY OF POTENTIAL VASCULAR PLANT SPECIES AT CARAVEL COPPER PROJECT

Note: * denotes introduced species; T denotes threatened flora and P1-P4 denote priority flora species (DPaW 2019).

FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Proteaceae (Cont.)	*Synaphea spinulosa* subsp. *major*						x	x
	Synaphea spinulosa subsp. *spinulosa*					x		
	Synaphea sp. Udumung (A.S. George 17058)							x
	Xylomelum angustifolium						x	
Pteridaceae	*Cheilanthes adiantoides*						x	
	Cheilanthes austrotenuifolia				x	x	x	
Resedaceae	* *Reseda luteola*						x	
Restionaceae	*Alexgeorgea nitens*							x
	Chaetanthus aristatus				x	x		
	Chordifex sphacelatus					x		
	Desmocladus asper				x	x	x	x
	Desmocladus austrinus					x		
	Desmocladus lateriflorus				x	x		x
	Desmocladus lateriticus							x
	Desmocladus myriocladus					x	x	
	Desmocladus parthenicus						x	
	Hypolaena humilis						x	
	Lepidobolus densus	P4			x	x		
	Lepidobolus preissianus						x	x
	Lepidobolus preissianus subsp. *volubilis*						x	
	Loxocarya albipes	P4					x	
	Loxocarya striata				x	x		
Rhamnaceae	*Blackallia nudiflora*	P3				x		
	Cryptandra arbutiflora var. *arbutiflora*				x	x	x	x
	Cryptandra intermedia				x	x		
	Cryptandra myriantha				x	x	x	x
	Cryptandra nutans				x	x	x	
	Cryptandra pungens						x	
	Papistylus grandiflorus	P2					x	
	Stenanthemum intricatum				x	x	x	
	Stenanthemum notiale subsp. *notiale*					x	x	
	Stenanthemum pomaderroides						x	
	Stenanthemum tridentatum						x	
	Trymalium angustifolium					x		
	Trymalium daphnifolium						x	
	Trymalium ledifolium				x			
	Trymalium ledifolium var. *rosmarinifolium*					x		x
	Trymalium odoratissimum subsp. *odoratissimum*				x	x		
	Trymalium urceolare					x		
Rubiaceae	*Opercularia vaginata*				x	x	x	x
Ruppiaceae	*Ruppia* sp.						x	
Rutaceae	*Asterolasia grandiflora*	P4	V	x				x
	Boronia ericifolia	P2					x	
	Boronia ovata							x
	Boronia scabra subsp. scabra							x
	Cyanothamnus coerulescens						x	
	Cyanothamnus coerulescens subsp. *spinescens*						x	
	Cyanothamnus ramosus subsp. *anethifolius*						x	

APPENDIX B: SUMMARY OF POTENTIAL VASCULAR PLANT SPECIES AT CARAVEL COPPER PROJECT

Note: * denotes introduced species; T denotes threatened flora and P1-P4 denote priority flora species (DPaW 2019).

FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Rutaceae (Cont.)	*Diplolaena andrewsii*	T	E	x				
	Diplolaena velutina						x	x
	Drummondita hassellii						x	
	Geleznowia verrucosa					x		
	Microcybe ambigua						x	
	Phebalium brachycalyx	P3					x	
	Phebalium tuberculosum						x	
	Philotheca nodiflora subsp. *calycina*						x	x
	Philotheca rhomboidea						x	
	Philotheca wonganensis	T	E	x				
Santalaceae	*Santalum acuminatum*						x	
	Spirogardnera rubescens	T	E	x				
Sapindaceae	*Diplopeltis huegelii* subsp. *lehmannii*						x	x
	Dodonaea bursariifolia						x	
	Dodonaea caespitosa				x	x		
	Dodonaea divaricata				x	x	x	
	Dodonaea pinifolia				x	x	x	
	Dodonaea viscosa						x	
	Dodonaea viscosa subsp. *angustissima*						x	
Scrophulariaceae	* *Dischisma capitatum*				x	x		
	Eremophila drummondii						x	
	Eremophila glabra subsp. *albicans*						x	
	Eremophila glabra subsp. *chlorella*	T	E	x		x		
	Eremophila lehmanniana				x	x	x	x
	Eremophila oldfieldii subsp. *oldfieldii*						x	
	Eremophila oppositifolia subsp. *angustifolia*						x	
	Eremophila papillata						x	
	Eremophila sargentii	P2					x	
	Eremophila scaberula	T	E	x		x		
	Eremophila ternifolia	T	E	x			x	
	* *Zaluzianskya divaricata*						x	
Solanaceae	*Anthocercis anisantha* subsp. *anisantha*						x	
	* *Datura inoxia*						x	
	* *Nicotiana glauca*						x	
	Nicotiana rotundifolia						x	
	Solanum hoplopetalum						x	
	Solanum lasiophyllum				x	x		
	* *Solanum nigrum*						x	
	* *Solanum sisymbriifolium*					x		
	Symonanthus bancroftii	T	E	x				
Stylidiaceae	*Levenhookia pusilla*				x	x	x	
	Stylidium adpressum					x		x
	Stylidium androsaceum				x	x	x	x
	Stylidium caricifolium				x	x		
	Stylidium cilium						x	
	Stylidium coroniforme						x	
	Stylidium coroniforme subsp. *coroniforme*	T	E	x			x	
	Stylidium crossocephalum					x		
	Stylidium despectum				x	x		
	Stylidium dichotomum				x	x	x	x

APPENDIX B: SUMMARY OF POTENTIAL VASCULAR PLANT SPECIES AT CARAVEL COPPER PROJECT

Note: * denotes introduced species; T denotes threatened flora and P1-P4 denote priority flora species (DPaW 2019).

FAMILY	SPECIES	SCC	FCC	EPBC	Paleochannel	Borefield	Mine	Pipeline
Stylidiaceae	*Stylidium ecorne*				x	x		
(Cont.)	*Stylidium emarginatum*				x	x		
	Stylidium eriopodum				x	x		
	Stylidium leptophyllum					x		
	Stylidium longitubum	P4			x	x		
	Stylidium miniatum				x	x		x
	Stylidium nungarinense						x	
	Stylidium obtusatum				x	x		
	Stylidium periscelianthum	P3			x	x	x	
	Stylidium petiolare						x	x
	Stylidium piliferum				x	x		
	Stylidium purpureum				x	x		
	Stylidium repens				x		x	
	Stylidium roseoalatum				x	x		
	Stylidium sacculatum	P3			x	x	x	
	Stylidium septentrionale					x	x	
	Stylidium spiciforme				x	x		
	Stylidium udusicola				x	x		
	Stylidium zeicolor					x		
	Stylidium sp.				x	x		
	Stylidium sp. Moora (J.A. Wege 713)	P2			x	x		
Surianaceae	*Stylobasium australe*					x	x	
Tamaricaceae	* *Tamarix aphylla*			x				
	* *Tamarix gallica*				x	x		
Thymelaeaceae	*Pimelea angustifolia*							x
	Pimelea argentea						x	
	Pimelea avonensis						x	
	Pimelea brevifolia subsp. *modesta*						x	
	Pimelea ciliata				x			
	Pimelea imbricata var. *piligera*						x	x
	Pimelea imbricata var. *simulans*						x	
	Pimelea leucantha							x
	Pimelea sulphurea						x	
Urticaceae	*Parietaria cardiostegia*						x	
Violaceae	*Hybanthus floribundus*						x	
	Hybanthus floribundus subsp. *floribundus*					x		

APPENDIX C1: LOCATION OF VEGETATION QUADRATS IN THE MINE SITE SURVEY AREA, 2018 AND 2021

QUADRAT	LOCATION (GDA94 Z50J)		2018	2021
	EASTING (mE)	NORTHING (mN)		
MS01	464179	6567276	x	
MS02	464206	6567218	x	
MS03	464362	6567185	x	
MS04	464485	6567065	x	
MS05	463815	6566571	x	
MS06	463740	6566564	x	
MS07	463860	6566907	x	
MS08	463880	6567034	x	
MS09	463842	6567124	x	
MS10	463476	6567174	x	
MS11	463674	6566746	x	
MS12	463585	6566936	x	
MS13	463456	6566816	x	
MS14	463381	6566789	x	
MS15	463080	6572956	x	
MS16	463665	6572732	x	
MS17	463683	6572631	x	
MS18	464292	6571412	x	
MS19	464095	6572062	x	
MS20	463935	6567321	x	
MS21	463946	6567400	x	
MS22	463936	6567536	x	
MS23	463743	6567438	x	
MS24	463827	6567509	x	
MS25	463068	6566916	x	
MS26	463033	6566857	x	
MS27	463686	6574645	x	
MS28	463793	6574753	x	
MS29	463792	6574920	x	
MS30	463795	6572201	x	
MS34	463868	6572754	x	
MS35	463789	6572822	x	
MS36	463625	6572488	x	
MS37	461249	6574033		x
MS38	457656	6574672		x
MS39	458701	6574956		x
MS40	458466	6575372		x
MS41	457900	6575883		x
MS42	457081	6571413		x
MS43	457165	6571714		x
MS44	456888	6571504		x
MS45	457568	6573520		x
MS46	457525	6573409		x
MS47	465687	6572845		x
MS48	462174	6572111		x
MS49	461593	6574404		x
MS50	461886	6574931		x
MS51	461361	6574815		x
MS52	461542	6575164		x
MS53	461985	6575302		x
MS54	462725	6575590		x
MS55	463093	6575148		x
MS56	461936	6571242		x
MS57	464763	6572083		x
MS58	465124	6572291		x
MS59	465158	6572095		x

APPENDIX C1: LOCATION OF VEGETATION QUADRATS IN THE MINE SITE SURVEY AREA, 2018 AND 2021

QUADRAT	LOCATION (GDA94 Z50J)		2018	2021
	EASTING (mE)	NORTHING (mN)		
MS60	465824	6572275		x
MS61	464883	6571572		x
MS62	464684	6571619		x
MS63	465745	6572685		x
MS64	465582	6572898		x
MS65	465490	6573134		x
MS66	465159	6573536		x
MS67	465194	6574293		x
MS68	464886	6574215		x
MS69	464505	6574870		x
MS70	464137	6574033		x
MS71	464927	6572577		x
MS84	466201	6566216		x
MS85	465068	6566188		x
MS86	463935	6566125		x
MS87	463267	6566184		x
MS88	462132	6566192		x
MS89	459061	6566169		x
MS90	457803	6566163		x
MS91	455575	6566291		x

APPENDIX C2: LOCATION OF VEGETATION QUADRATS IN KOODJEE NATURE RESERVE 2021

QUADRAT	LOCATION (GDA94 Z50J)	
	EASTING (mE)	NORTHING (mN)
KR01	406175	6582503
KR02	406156	6582301
KR03	405960	6582500
KR04	406367	6582522
KR05	406603	6582182
KR06	406844	6581778
KR07	406770	6581897
KR08	406961	6581826
KR09	406939	6581919
KR10	406686	6582176
KR11	406754	6582287
KR12	406755	6582542
KR13	406709	6582552
KR14	406500	6582657
KR15	406461	6582586
KR16	406736	6582170

APPENDIX D: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN THE CARAVEL COPPER PROJECT SURVEY AREA

Note: Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt;; COO – Coolgardie; ESP – Esperance Plains; GAS- Gascoyne; GES – Geraldton Sandplains; GVD- Great Victorian Desert; JAF – Jarrah Forest; LSD- Little Sandy Desert; MAL – Mallee; NJF – Northern Jarrah Forrest; SWA – Swan Coastal Plain; YAL – Yalgoo. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking. Note: The "initial project area" does not include the potential bore field near Moore River.

Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Acacia cochlocarpa subsp. *cochlocarpa*	Fabaceae	T	Endangered	Habit: Glabrous, sprawling shrub, at 0.3-0.7(-1.5) metres high. Flower colour: Yellow Flowering period (indicated in green): J F M A M J J A **S** O N D Soils: Occurs within clayey, sandy, often gravelly soils. IBRA Distribution: AVW, GES Florabase records: 24	LOW Previously recorded in wider area but not near initial project area.
Acacia pharangites	Fabaceae	T	Endangered	Habit: Spindly, open shrub, 1.5-3(-4) metres high Flower colour: Yellow Flowering period (indicated in green): J F M A M J J **A** S O N D Soils: Occurs within red-brown clay and greenstone. Mostly found on gullies and slopes. IBRA Distribution: AVW Florabase records: 16	LOW Recorded previously in the Wongan Hills range but not near initial project area.
Acacia pygmaea	Fabaceae	T	Endangered	Habit: Erect, single-stemmed shrub, 0.3-0.5(-0.7) metres high Flower colour: Cream-white Flowering period (indicated in green): **J F M** A M J J A S **O N D** Soils: Occurs within summit of ridges on laterite. IBRA Distribution: AVW Florabase records: 12	LOW Recorded previously in the Wongan Hills range but not near initial project area.

APPENDIX D: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN THE CARAVEL COPPER PROJECT SURVEY AREA

Note: Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt;; COO – Coolgardie; ESP – Esperance Plains; GAS- Gascoyne; GES – Geraldton Sandplains; GVD- Great Victorian Desert; JAF – Jarrah Forest; LSD- Little Sandy Desert; MAL – Mallee; NJF – Northern Jarrah Forrest; SWA – Swan Coastal Plain; YAL – Yalgoo. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking. Note: The "initial project area" does not include the potential bore field near Moore River.

Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Acacia splendens	Fabaceae	T	Endangered	Habit: Tree or shrub, to 8 metres high, bark dark grey. Flower colour: Yellow Flowering period (indicated in green): J F M A **M** J J A S O N D Soils: Found on white sand over clay, pale brown loam, cracked brown soil, gravel, laterite and ironstone. Also occurs on slopes of breakaways, especially on southern slope and Hills. IBRA Distribution: GES, SWA Florabase records: 49	LOW Found considerably North West of the bore fields.
Acacia vassalii	Fabaceae	T	Endangered	Habit: Semi-prostrate, spreading, rounded shrub, 0.15-0.3 metres high. Flower colour: Yellow Flowering period (indicated in green): J F M A M **J J** A S O N D Soils: Occurs on grey/brown or yellow sand/ sandy loam. IBRA Distribution: AVW, GES Florabase records: 39	LOW Not suitable distribution. Recorded North of the pipeline and northeast near Wongan Hills.
Banksia fuscobractea	Proteaceae	T	Critically Endangered	Habit: Erect, prickly, non-lignotuberous shrub, ca 1 metres high Flower colour: Yellow Flowering period (indicated in green): J F M A M J **J A S O** N D Soils: Found on lateritic gravel and grey sand over laterite. IBRA Distribution: JAF, SWA Florabase records: 10	LOW This area is associated mainly with weathered rock, deep sands with ironstone and gravelly soils and loam. Also may be associated with lateritic on weathered granite. Near borefield, but not proposed initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Banksia serratuloides subsp. *serratuloides*	Proteaceae	T	Vulnerable	Habit: Low, bushy, lignotuberous shrub, 0.3-1 m high Flower colour: Yellow Flowering period (indicated in green): J F M A M J **J A S** O N D Soils: Found on loam or clay loam over laterite and/or sandy gravel. IBRA Distribution: AVW, JAF, SWA Florabase records: 27	MEDIUM - HIGH Probability along the river area near the bore field. This area is associated mainly with weathered rock, deep sands with ironstone and gravelly soils and loam. Not near initial project area.
Conospermum densiflorum subsp. unicephalatum	Proteaceae	T	Endangered	Habit: Erect, much-branched shrub, 0.3-0.6 m high, inflorescence a spike. Flower colour: Cream/white & blue Flowering period (indicated in green): J F M A M J J A **S O N** D Soils: Clay soils. Low-lying areas. IBRA Distribution: AVW, JAF, SWA Florabase records: 16	MEDIUM - HIGH Probability along the river area near the bore field. Not near initial project area.
Conostylis wonganensis	Haemodoraceae	T	Endangered	Habit: Rhizomatous, tufted perennial, grass-like or herb, 0.08-0.17 m high Flower colour: Yellow Flowering period (indicated in green): J F M A M J **J A S** O N D Soils: Occurs on yellow sand and sandy clay. IBRA Distribution: AVW Florabase records: 17	LOW Found along the Wongan Hills area and further east.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Darwinia acerosa	Myrtaceae	T	Endangered	Habit: Spreading, compact shrub, 0.2-0.6 metres high Flower colour: Green, red and purple Flowering period (indicated in green): J F M A M J J A **S O N** D Soils: Occurs on sand, loam, and often moist soils. Granite outcrops, road verges. IBRA Distribution: JAF, SWA Florabase records: 18	MEDIUM - HIGH Along the river at the bore fields site. This area is associated mainly with weathered rock, deep sands with ironstone and gravelly soils and loam. Not near initial project area.
Darwinia carnea	Myrtaceae	T	Endangered	Habit: Spreading shrub, 0.2-0.45 metres high Flower colour: Green and red Flowering period (indicated in green): J F M A M J J A S **O N D** Soils: Occurs on lateritic loam and gravel IBRA Distribution: AVW, ESP, JAF, SWA Florabase records: 20	LOW Mainly south near the Mogumber area and potential borefield.
Dasymalla axillaris	Lamiaceae	T	Critically Endangered	Habit: Spreading shrub Flower colour: Red/pink Flowering period (indicated in green): J F M A M J **J** A **S O N D** Soils: Occurs on yellow sand, yellow/brown sandy clay. Occurs mostly on flat plains. IBRA Distribution: AVW, SWA, YAL Florabase records: 39	LOW Found in the Wongan Hills and northwards.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Daviesia euphorbioides	Fabaceae	T	Endangered	Habit: Erect, spindley shrub, 0.4-0.8 metres high Flower colour: Yellow and red Flowering period (indicated in green): J F M A M J **J A S** O N D Soils: Occurs on clayey sand and sandy gravel on flats and sandplains. IBRA Distribution: AVW Florabase records: 15	LOW Found in the Wongan Hills area and further east and southeast of Wongan Hills.
Eleocharis keigheryi	Cyperaceae	T	Vulnerable	Habit: Rhizomatous, clumped perennial, grass-like or herb (sedge), to 0.4 metres high. Flower colour: Green Flowering period (indicated in green): J F M A M J J **A S O N** D Soils: Occurs on clay, sandy loam and emergent in freshwater, such as creeks and claypans. IBRA Distribution: AVW, GES, JAF, SWA Florabase records: 56	LOW Found south near Mogumber within potential borefield area, but mainly south of this area and the project area.
Eremophila glabra subsp. *chlorella*	Scrophulariaceae	T	Endangered	Habit: Prostrate and spreading or sprawling shrub, 0.2-1 metres high. Flower colour: Green/yellow Flowering period (indicated in green): J F M A M J **J A S O N** D Soils: Occurs on sandy clay in winter wet depressions. IBRA Distribution: AVW, GES, JAF, SWA Florabase records: 32	LOW Found near the western side of the bore field previously. This area is associated mainly with weathered rock, deep sands with ironstone and gravelly soils and loam. Not near the initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Eremophila scaberula	Scrophulariaceae	T	Endangered	Habit: Low compact or sprawling to upright shrub, 0.15-0.7(-1.5) metres high. Flower colour: Purple/blue Flowering period (indicated in green): J F M A M J J **A S O** N D Soils: Occurs on clay, sandy clay or loam in winter-wet plains, inundated areas. IBRA Distribution: AVW, JAF Florabase records: 16	LOW Found north of the bore fields near the river beds. Not near the initial project area.
Eremophila ternifolia	Scrophulariaceae	T	Endangered	Habit: Low spreading shrub, 0.3-0.5 metres high Flower colour: Blue Flowering period (indicated in green): J F M A M J J A **S O N D** Soils: Occurs on red clay between breakaways. IBRA Distribution: AVW Florabase records: 6	LOW Mostly found near Wongan Hills to north and north-east.
Eucalyptus pruiniramis	Myrtaceae	T	Endangered	Habit: Mallee or tree, 2.5-7 metres high, often with straggly, tumbledown crown; bark rough & ribbony at base, smooth above. Flower colour: Cream Flowering period (indicated in green): J F M A M J J A S O N **D** Soils: Occurs within skeletal soils over sandstone or laterite on rocky Hillslopes. IBRA Distribution: AVW, GES, JAF Florabase records: 37	MEDIUM Chance near the bore field site. Records of the species have been found in close proximity to the area previously. Has been found previously on a range of soils, Including flat yellow sand, yellow brown loam on lateritic gravel, rocky loam, and lateritic Hills on gravelly soils. Not near the initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Gastrolobium hamulosum	Fabaceae	T	Endangered	Habit: Erect, spindly and low shrub, 0.2-0.45 metres high. Flower colour: Yellow, orange, red and purple Flowering period (indicated in green): J F M A M J J **A S O** N D Soils: Occurs on sandy, often gravelly soils or clay, as well as on flats, slopes and ridges. IBRA Distribution: AVW, GES Florabase records: 43	HIGH Chance near the pipeline survey area. Occurs on soils and topography associated in the area. Has been found near the area previously. Despite searching none located as most previous Herbarium records now in cleared paddocks.
Glyceria drummondii	Poaceae	T	Endangered	Habit: Annual, grass-like or herb. Flower colour: Green Flowering period (indicated in green): J F M A M J **J A S O** N D Soils: Occurs on brown to grey clay, in localised hollows in claypans and within seasonally flooded areas. IBRA Distribution: AVW, GES, JAF Florabase records: 11	MEDIUM Just to the south of the potential bore fields site.
Goodenia arthrotricha	Goodeniaceae	T	Endangered	Habit: Erect perennial, herb, to 0.4 m high. Flower colour: Blue Flowering period (indicated in green): J F M A M J J A S **O N** D Soils: Gravel. Granite rocks, slopes. IBRA Distribution: AVW, JAF, SWA Florabase records: 20	LOW-MEDIUM Maybe present near the potential bore field. Not near initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Grevillea bracteosa subsp. *bracteosa*	Proteaceae	T	-	Habit: Shrub, 1-2 metres high Flower colour: Pink Flowering period (indicated in green): J F M A M J J **A** **S** **O** N D Soils: Occurs on orange-brown laterite gravel over clay/loam, on hill slopes. IBRA Distribution: AVW, GES, JAF Florabase records: 38	MEDIUM Chance near the paleo channel areas. Not in the initial project area.
Grevillea sp. Gillingarra (R.J. Cranfield 4087)	Proteaceae	T	Critically Endangered	Habit: Shrub Flower colour: Red/Pink Flowering period (indicated in green): J F M A M J J A **S** O N D Soils: Occurs on plains with gravelly, brown, sandy loam. Also occurs on edges of creek on a steep slope on red lateritic loam. IBRA Distribution: JAF, SWA Florabase records: 8	MEDIUM Probability near the south eastern tip of the bore fields survey area. Previously found in close proximity to the area. Not in the initial project area.
Haloragis platycarpa	Haloragaceae	T	Critically Endangered	Habit: Perennial herb, up to 0.3 metres high. Flower colour: Green/white Flowering period (indicated in green): J F M A M J J A **S** **O** N **D** Soils: Occurs in loamy clay and Hills tops on granite. Also occurs on clay pans. IBRA Distribution: AVW, JAF Florabase records: 13	LOW North of the bore fields site. Not in the initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Lysiosepalum abollatum	Malvaceae	T	Critically Endangered	Habit: Dense, erect shrub, to 1.5 metres high. Flower colour: Pink-blue-purple Flowering period (indicated in green): J F M A M J J **A S** O N D Soils: Occurs on red clay or brown /red sandy loam over laterite. IBRA Distribution: AVW Florabase records: 12	LOW Found in the Wongan Hills area. Not in the initial project area.
Melaleuca sciotostyla	Myrtaceae	T	Endangered	Habit: Spreading shrub, 0.6-1.5 metres high Flower colour: Creamy/white Flowering period (indicated in green): J F M A M J J **A S O** N D Soils: Occurs on orange clayey sand with lateritic pebbles and slopes. IBRA Distribution: AVW, COO, JAF Florabase records: 36	LOW Found in the Wongan Hills area. Not in the initial project area.
Microcorys eremophiloides	Lamiaceae	T	Vulnerable	Habit: Erect shrub, to 2 metres high. Flower colour: Red/pink Flowering period (indicated in green): J F M A M J J A **S O N** D Soils: Occurs on shallow soils over massive laterite, granite. IBRA Distribution: AVW Florabase records: 25	LOW Found in the Wongan Hills area and then eastwards and to southeast. Not in the initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Rhagodia acicularis	Chenopodiaceae	T	Vulnerable	Habit: Compact, intricately branched, spiny shrub, up to 0.5 metres high. Flower colour: yellow-green Flowering period (indicated in green): J F **M** A M J J A S **O** N D Soils: Red lateritic gravel. Slopes. IBRA Distribution: AVW Florabase records: 9	LOW Found in the Wongan Hills area to north and northeast. Not in the initial project area.
Stylidium coroniforme subsp. coroniforme	Stylidiaceae	T	Endangered	Habit: Rosetted perennial, herb, 0.07-0.18 m high. Inflorescence racemose, or paniculate. Flower colour: Yellow/pink Flowering period (indicated in green): J F M A M J J A **S** **O** N D Soils: Shallow sand over laterite. Upland habitats. IBRA Distribution: AVW Florabase records: 5	MEDIUM Found in the Wongan Hills area to north and northeast. Near the initial project area.
Thomasia sp. Green Hill (S. Paust 1322)	Malvaceae	T	Endangered	Habit: Multi-stemmed shrub. Flower colour: Blue-purple Flowering period (indicated in green): J F M A M J J A S **O** N D Soils: Rocky rise. IBRA Distribution: AVW, NJF Florabase records: 6	LOW Found south of pipeline. Not in the initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Verticordia staminosa subsp. staminosa	Myrtaceae	T	Endangered	Habit: Spreading shrub, 0.15-0.6 m high. Flower colour: Green-yellow/yellow-brown Flowering period (indicated in green): J F M A M J **J A S O** N D Soils: Soil pockets. Granite outcrops. IBRA Distribution: AVW Florabase records: 12	LOW Found in the Wongan Hills area to north and northeast. Not in the initial project area.
Acacia trinalis	Fabaceae	P1		Habit: Dense, rounded, bushy shrub or tree, 1.5-4 m high Flower colour: Yellow Flowering period (indicated in green): J F M A M J J A **S** O N D Soils: Red lateritic gravel. Slopes. IBRA Distribution: AVW Florabase records: 9	LOW Found considerably north and south of the initial project area.
Acacia sp. New Norcia (E.A. Griffin 5917)	Fabaceae	P1		Habit: Prostrate, mat-forming shrub, 0.15-0.25 m high, 0.4-1 m wide. Flower colour: Yellow Flowering period (indicated in green): J F M A M J J A S O N D Soils: Lateritic sand. IBRA Distribution: AVW, JAF Florabase records: 3	LOW Found south of pipeline. Not in the initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Caladenia dundasiae	Orchidaceae	P1		Habit: Compact, intricately branched, spiny shrub, up to 0.5 metres high. Flower colour: Yellow-green Flowering period (indicated in green): J F **M** A M J J A S **O** N D Soils: Occurs on red lateritic gravel and slopes. IBRA Distribution: AVW Florabase records: 9	LOW North of the pipeline and not in initial project area.
Calandrinia uncinella	Montiaceae	P1		Habit: Small annual herb Flower colour: White, pale pink Flowering period (indicated in green): J F M A M J J A **S** **O** N D Soils: Occurs in cream sand over clay and grey/brown silty loam. Also occurs on saline river flats. IBRA Distribution: AVW, JAF, SWA Florabase records: 7	MEDIUM Sample found on the salt flats 1km north of the mine site. Previously found in saline river flats on grey/brown silty loam.
Drosera orbiculata	Droseraceae	P1		Habit: Rosetted tuberous, perennial, herb, to 0.015 metre high, to 0.04 metre wide. Flower colour: White Flowering period (indicated in green): J F M A **M** **J** J A S O N D Soils: Occurs on sandy clay in winter-wet depressions. IBRA Distribution: JAF Florabase records: 3	LOW On the eastern side of the Moora river near the bore field. Not in initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Hakea chromatropa	Proteaceae	P1		Habit: Non-lignotuberous, bushy shrub, to 2.5 m high. Flower colour: Cream/pink Flowering period (indicated in green): J F M A M J J **A** **S** O N D Soils: Occurs on gravelly loam and in open shrubland. IBRA Distribution: AVW, JAF Florabase records: 6	MEDIUM On the edge of the mine site to the west. Has been recorded previously close to the road verge in gravelly loam.
Jacksonia debilis	Fabaceae	P1		Habit: Prostrate shrub Flower colour: Yellow Flowering period (indicated in green): J F M A M J J A **S** **O** N D Soils: Occurs on white or grey clayey sand. IBRA Distribution: AVW, MAL Florabase records: 23	LOW Considerably south of the mine site. Not in initial project area.
Lasiopetalum cenobium	Malvaceae	P1		Habit: Shrub. Flower colour: Pink or lilac Flowering period (indicated in green): J F M A M J J A S O N D Soils: IBRA Distribution: AVW Florabase records: 2	LOW Found south of pipeline. Not in the initial project area.

APPENDIX D: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN THE CARAVEL COPPER PROJECT SURVEY AREA

Note: Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt;; COO – Coolgardie; ESP – Esperance Plains; GAS- Gascoyne; GES – Geraldton Sandplains; GVD- Great Victorian Desert; JAF – Jarrah Forest; LSD- Little Sandy Desert; MAL – Mallee; NJF – Northern Jarrah Forrest; SWA – Swan Coastal Plain; YAL – Yalgoo. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking. Note: The "initial project area" does not include the potential bore field near Moore River.

Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Scaevola tortuosa	Goodeniaceae	P1		Habit: Ascending perennial, herb, 0.1-0.2 m high. Flower colour: blue-purple/pink Flowering period (indicated in green): J F M **A** M J J A **S** **O** **N** D Soils: Sandy clay. Margins of salt lakes. IBRA Distribution: AVW, COO, MAL Florabase records: 19	LOW Found in the Wongan Hills area and then southwards. Not in initial project area.
Micromyrtus rogeri	Myrtaceae	P1		Habit: Shrub, 0.2-0.4 metres high. Flower colour: White Flowering period (indicated in green): J F M A M J **J** **A** **S** **O** N D Soils: Occurs in yellow-brown sandy soils, gravel, and laterite on breakaways. IBRA Distribution: GES Florabase records: 13	LOW North of the bore fields site. Not in initial project area.
Acacia congesta subsp. *wonganensis*	Fabaceae	P2		Habit: Shrub, 1-2 metres high. Flower colour: Yellow Flowering period (indicated in green): J F M A M J J **A** **S** O N D Soils: Occurs on rocky clay on laterite. IBRA Distribution: AVW Florabase records: 15	LOW Found around the Wongan Hills area. Not in the initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Acacia drewiana subsp. *minor*	Fabaceae	P2		Habit: Spreading shrub, 0.15-0.5 metres high. Flower colour: Yellow Flowering period (indicated in green): J F M A **M** **J** J A S O N D Soils: Occurs on sandy & gravelly soils. IBRA Distribution: AVW, MAL Florabase records: 26	LOW Found around the Wongan Hills area and southwards. Not in initial project area.
Acacia dura	Fabaceae	P2		Habit: Densely branched shrub, 0.6-1.6 metres high. Flower colour: Yellow Flowering period (indicated in green): J F M A M J J **A** S O N D Soils: Occurs on sand, sandy loam, and laterite. IBRA Distribution: AVW Florabase records: 15	LOW North of the pipeline and mine site and Wongan Hills. Not in initial project area.
Boronia ericifolia	Rutaceae	P2		Habit: Erect shrub, 0.3-1.2 metres high. Flower colour: White/cream-yellow Flowering period (indicated in green): J F M **A** M **J** J **A** **S** O N D Soils: Occurs in sandy loam, clay, and laterite. Found in low-lying spots. IBRA Distribution: AVW, SWA Florabase records: 23	LOW Found around the Wongan Hills area and then northwest and eastwards. Not in the project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Calandrinia wilsonii	Montiaceae	P2		Habit: Erect, scrambling, perennial herb with fleshy leaves. Flowering period (indicated in green): J F M A M J J A S **O** N D Soils: Occurs on saline flats on yellow-brown, fine, silty clay or gypsum soil. IBRA Distribution: AVW, GES Florabase records: 7	HIGH Within 1 km towards the east of the mine site near salt flats. Previously recorded on a small rise above saline river flats. Brown clayey sand.
Calothamnus quadrifidus subsp. *asper*	Myrtaceae	P2		Habit: Erect tall shrub Flower colour: Red Flowering period (indicated in green): J **F** M A M J J **A S O N** D Soils: Red-brown sand-loam, gravel. Reserve, breakaway. Greenstone laterite. IBRA Distribution: AVW Florabase records: 17	LOW Found in the Wongan Hills area. Not in initial project area.
Eremophila sargentii	Scrophulariaceae	P2		Habit: Shrub, 0.3-2 metres high. Flower colour: Purple-blue Flowering period (indicated in green): J F M A M J J **A S O** N D Soils: Occurs within laterite and sandy loam on sandplains and Hills. IBRA Distribution: AVW Florabase records: 17	LOW Found in the Wongan Hills area and to north and north-east of Wongan Hills. Not in initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Grevillea kenneallyi	Proteaceae	P2		Habit: Spreading, dense shrub, 1.2-3 m high. Flower colour: white Flowering period (indicated in green): J F M A M J **J** **A** **S** O N D Soils: Gravelly loam, laterite. IBRA Distribution: AVW Florabase records: 21	LOW Found in the Wongan Hills area and to north-east of Wongan Hills. Not in initial project area.
Papistylus grandiflorus	Rhamnaceae	P2		Habit: Shrub, 0.3-0.8 metres high. Flower colour: White/Pale pink Flowering period (indicated in green): J F M A M J J **A** **S** **O** N D Soils: Brown, brown-red or yellow sandy clay, yellow-brown rocky sand, granite. Hillslopes, plains. IBRA Distribution: AVW Florabase records: 21	LOW Found in the Wongan Hills area and north of Watheroo. Not in initial project area.
Petrophile clavata	Proteaceae	P2		Habit: Erect shrub, to 0.7 m high. Flower colour: Yellow-cream Flowering period (indicated in green): J F M A M J J A **S** O N D Soils: Grey sand, laterite. Hilltops and rises. IBRA Distribution: AVW, GES, JAF Florabase records: 14	LOW Found south of pipeline. Not in the initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Stylidium sp. Moora (J.A. Wege 713)	Stylidiaceae	P2		Habit: Stilted perennial herb, trigger plant Flower colour: Pink Flowering period (indicated in green): J F M A M J J A **S O N** D Soils: Occurs in pale brown gravelly clay on Slopes. Also occurs within Sandy soil and laterite. IBRA Distribution: AVW, JAF, SWA Florabase records: 18	MEDIUM Previously been recorded near the river within the proposed bore field boundary. Not in initial project area.
Synaphea rangiferops	Proteaceae	P2		Habit: Shrub, to 0.3 metres high. Flower colour: Yellow Flowering period (indicated in green): J F M A M J **J A S** O N D Soils: Occurs in sandy loam, gravel. IBRA Distribution: AVW, JAF, SWA Florabase records: 19	MEDIUM Previously found near the river side of the bore field. Associated with soils found within the proposed bore field area. Not in initial project area.
Synaphea sparsiflora	Proteaceae	P2		Habit: Shrub, to 0.6 metres high, to 1 metre wide. Flower colour: Yellow Flowering period (indicated in green): J F M A M J J **A S** O N D Soils: Occurs on sandy loam over laterite. IBRA Distribution: GES, SWA Florabase records: 17	HIGH Previously recorded in the south west area of the proposed bore field. Found on a crest on a small rise in red-brown clayey sand over laterite. Not in initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Acacia anarthros	Fabaceae	P3		Habit: Erect or prostrate, spinose shrub, 0.1-0.5 m high. Flower colour: Yellow Flowering period (indicated in green): J F M A M **J J A S** O N D Soils: Lateritic gravelly soils. Slopes. IBRA Distribution: AVW, JAF Florabase records: 32	LOW Previously recorded near the pipeline. Not in initial project area.
Acacia cummingiana	Fabaceae	P3		Habit: Sprawling, straggly, rush-like shrub, 0.3-0.5 metres high. Flower colour: Yellow Flowering period (indicated in green): J F M A **M J** J A S O N D Soils: Occurs on grey or yellow sand, and lateritic gravel. Found within sandplains and lateritic breakaways. IBRA Distribution: AVW, GES, SWA Florabase records: 24	LOW Previously recorded to the south west of the bore field, on the boundary Not in initial project area.
Acacia drummondii subsp. affinis	Fabaceae	P3		Habit: Erect shrub, 0.3-1 m high. Flower colour: Yellow Flowering period (indicated in green): J F M A M J **J A** S O N D Soils: Lateritic gravelly soils. IBRA Distribution: AVW, JAF, SWA Florabase records: 37	LOW Previously recorded near pipeline. Not in initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Acacia filifolia	Fabaceae	P3		Habit: Wispy, spindly, single-stemmed shrub or tree, 1.2-3 metres high. Flower colour: Yellow Flowering period (indicated in green): J F M A **M J J A S** O N D Soils: Occurs on yellow sand, gravelly lateritic sand on sandplains. IBRA Distribution: AVW, COO, GES Florabase records: 52	LOW Found in the Wongan Hills area and further north-west and south-east. Not in initial project area.
Acacia phaeocalyx	Fabaceae	P3		Habit: Intricately branched, sprawling or compact, pungent shrub, 0.3-0.6(-0.8) metres high. Flower colour: Yellow Flowering period (indicated in green): J F M **A M J** J A S O N D Soils: Occurs on yellow or white sand, often over laterite, on flats and Hillsides. IBRA Distribution: AVW Florabase records: 39	LOW Found in the Wongan Hills area and then southeast of Wongan Hills. Not in initial project area.
Acacia repanda	Fabaceae	P3		Habit: Rounded to obconic, single-stemmed or much-branched shrub, 0.5-2 metres high. Has 'minni-ritchi' bark. Flower colour: Yellow Flowering period (indicated in green): J F M A M **J J A** S O N D Soils: Found on loam, sandy or gravelly loam, near granite outcrops. IBRA Distribution: AVW, COO, MAL Florabase records: 19	LOW Found in the Wongan Hills area and east of Hyden. Not in initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Acacia ridleyana	Fabaceae	P3		Habit: Spreading, sprawling shrub, 0.2-0.9 metres high, 0.5-2 metres wide. Flower colour: Yellow-brown Flowering period (indicated in green): J F M A M J J **A S O N D** Soils: Occurs on grey or yellow/brown sand, gravelly clay, or granitic loam. IBRA Distribution: AVW, GES, JAF Florabase records: 27	MEDIUM Previously has been recorded south of the proposed bore field, in gravelly clay along the roadside. Not in initial project area.
Allocasuarina grevilleoides	Casuarinaceae	P3		Habit: Dioecious, lignotuberous shrub, 0.15-0.4 metres high. Soils: Sand over laterite, gravel. IBRA Distribution: AVW, GES, JAF, SWA Florabase records: 36	LOW Samples found near Mogumber. Not in initial project area.
Angianthus micropodioides	Asteraceae	P3		Habit: Erect or decumbent annual, herb, 0.03-0.15 metres high. Flower colour: Yellow-white, Flowering period (indicated in green): **J F** M A M J J A S O **N D** Soils: Occurs on Saline sandy soils, on river edges, saline depressions and claypans. IBRA Distribution: AVW, GES, SWA Florabase records: 41	LOW Located around the Wongan Hills area and to north and south. No in initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Banksia kippistiana var. *paenepeccata*	Proteaceae	P3		Habit: Erect, prickly, lignotuberous shrub, 0.3-1.2 metres high. Flower colour: Yellow-cream Flowering period (indicated in green): J F M A M J J A S **O** **N** D Soils: Found on lateritic gravelly soils. IBRA Distribution: GES, JAF, SWA Florabase records: 28	LOW One recorded near the bore field site but on the other side of the Moore River. Not in initial project area.
Banksia pteridifolia subsp. *vernalis*	Proteaceae	P3		Habit: Prostrate, lignotuberous shrub, to 0.4 metres high. Flower colour: Cream-white/yellow Flowering period (indicated in green): J F M A M J J A **S** **O** N D Soils: Occurs on white/grey sand over laterite. IBRA Distribution: GES, JAF, SWA Florabase records: 34	MEDIUM Specimens previously recorded in close proximity either side of the proposed bore fields within sand over laterite. Not in initial project area.
Beaufortia eriocephala	Myrtaceae	P3		Habit: Erect, compact shrub, 0.3-0.6 metres high. Flower colour: Red Flowering period (indicated in green): J F M A M J J A **S** **O** **N** D Soils: Occurs on lateritic sandy soils, on slopes. IBRA Distribution: AVW, GES, JAF, SWA Florabase records: 28	MEDIUM Previously recorded in the potential bore field, in red-brown lateritic soil. Not in initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Blackallia nudiflora	Rhamnaceae	P3		Habit: Shrub, 0.3-1 metres high, often with spinescent branchlets. . Flower colour: Pink/ white Flowering period (indicated in green): J F M A M J J **A** S O N D Soils: Occurs within clay or sandy clay with granite, on Hills or breakaway sand plains. IBRA Distribution: GES, JAF Florabase records: 24	LOW Found to the north of the bore fields site. Not in the initial project area.
Chamelaucium sp. Wongan Hills (B.H. Smith 1140)	Myrtaceae	P3		Habit: Low spreading shrub Flower colour: Purple/pink Flowering period (indicated in green): J F **M** A M J J A S **O** N D Soils: Located on cream sand, brown sandy loam, white sand over laterite or red sandy soil. Frequently found on salt flats. IBRA Distribution: AVW, GES, YAL Florabase records: 27	HIGH Previously recorded on the boundary of the mine site, to the north near the salt flats.
Daviesia nudiflora subsp. *drummondii*	Fabaceae	P3		Habit: Bushy shrub, 0.3-1.5 metres high Flower colour: Orange/yellow and red Flowering period (indicated in green): J F M A M J **J** **A** S O N D Soils: Occurs on in white or grey sand on undulating low rises. IBRA Distribution: AVW Florabase records: 25	LOW Located around the Wongan Hills area and to the south and south-east. Not in initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Dicrastylis velutina	Lamiaceae	P3		Habit: Shrub, 0.1-0.6 metres high Flower colour: White Flowering period (indicated in green): J F M A M J J A S **O N D** Soils: Occurs sandy soils, gravelly loam IBRA Distribution: AVW, GES, SWA Florabase records: 9	LOW Located around the Wongan Hills area and then to the north-west and south-easy. Not in the initial project area.
Eucalyptus arachnaea subsp *arrecta*	Myrtaceae	P3		Habit: Tree, 5-10(-15) m high, bark rough. Flower colour: White/ cream Flowering period (indicated in green): J F M A M J J A S O N D Soils: Clay loam on granite, gravelly loam. Breakaway slopes, gullies. IBRA Distribution: AVW, GES Florabase records: 18	LOW Occurs north of Watheroo. Not near initial project area.
Eucalyptus macrocarpa × *pyriformis*	Myrtaceae	P3		Habit: Erect, open mallee tree, 1.2-6 metres high. Flower colour: Red Flowering period (indicated in green): J F M **A** M J J **A S O** N D Soils: Occurs in sand and lateritic sandy soils, as well as Hills, rocky ironstone ridges, and sandplains. IBRA Distribution: AW,GSP,JF,SCP Florabase records: 44	HIGH Previously recorded multiple times within the mine site, this includes on Hillslopes, road verges, and occurring in pale yellow sand.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Eucalyptus sargentii subsp. onesis	Myrtaceae	P3		Habit: Mallee, erect/sprawling tree. Flower colour: Cream Flowering period (indicated in green): J F M A M J J A S O N D Soils: Flat, yellow-brown sand. IBRA Distribution: AVW, MAL Florabase records: 22	LOW Previously recoded mainly south of Wongan Hills and pipeline. Not in initial project area.
Gastrolobium rotundifolium	Fabaceae	P3		Habit: Erect, bushy shrub, to 0.8 metres high. Flower colour: Orange, yellow and red Flowering period (indicated in green): J F M A M J J A S O N D Soils: Occurs in heavy clay or loam soils, granite, sandstone and quartzite, on low rises, breakaways. IBRA Distribution: AW,GS Florabase records: 34	HIGH Previously recorded in close proximity to the eastern side on the mine site. Occurs in open woodland of Eucalyptus wandoo and occurs on grey brown sandy loam, associated with granite outcrops and laterite.
Gnephosis multiflora	Asteraceae	P3		Habit: Erect annual, herb, 0.025-0.04 metres high. Flower colour: Yellow Flowering period (indicated in green): J F M A M J J A S O N D Soils: Occurs in sandy saline soils on river flats and sandy rises. IBRA Distribution: AW,M Florabase records: 7	LOW North of the mine site and then south-east of Wongan Hills.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Grevillea florida	Proteaceae	P3		Habit: Erect shrub, to 0.9 metres high. Flower colour: Cream-yellow Flowering period (indicated in green): J F M A M J **J A S** O N D Soils: Occurs in sand, sandy clay, gravel and laterite. Located on sandplains, slopes and road verges. IBRA Distribution: GS,JF,SCP Florabase records: 19	LOW Just south of the pipeline and borefield. Not in initial project area.
Guichenotia impudica	Malvaceae	P3		Habit: Shrub, 0.25-1 metres high Flower colour: Pink-purple Flowering period (indicated in green): J F M A M J J **A S O** N D Soils: Occurs on laterite IBRA Distribution: AW,GS,JF Florabase records: 21	HIGH Previously recorded within the mine site, on laterite and cleared land.
Guichenotia tuberculata	Malvaceae	P3		Habit: Erect, open shrub, (0.25-)0.6-0.9 metres high Flower colour: Purple-pink Flowering period (indicated in green): J F M A M J J **A S O** N D Soils: Occurs on sand and clay over laterite IBRA Distribution: AW,JF,SCP Florabase records: 23	MEDIUM Previously recorded on the boundary of the proposed bore fields, on the roadside verge. Not in initial project area.
Lepidosperma sp. Meckering	Cyperaceae	P3		Habit: Tufted sedge, 25 cm high x 25 cm wide Soils: Occurs on dark brown sandy loam IBRA Distribution: AW Florabase records: 6	MEDIUM Previous samples 5km to the south west of the mine site on similar topography.

APPENDIX D: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN THE CARAVEL COPPER PROJECT SURVEY AREA

Note: Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt;; COO – Coolgardie; ESP – Esperance Plains; GAS- Gascoyne; GES – Geraldton Sandplains; GVD- Great Victorian Desert; JAF – Jarrah Forest; LSD- Little Sandy Desert; MAL – Mallee; NJF – Northern Jarrah Forrest; SWA – Swan Coastal Plain; YAL – Yalgoo. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking. Note: The "initial project area" does not include the potential bore field near Moore River.

Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Melaleuca sclerophylla	Myrtaceae	P3		Habit: Erect-spreading to prostrate shrub, 0.15-0.9 metres high. Flower colour: Purple-pink Flowering period (indicated in green): J F M A M **J J A S** O N D Soils: Occurs on Gravelly and clayey sand, on granite outcrops and rises. IBRA Distribution: AW,GS,JF Florabase records: 46	LOW Recorded near Wongan Hills, north of Moora and northwest of Calingiri. East of initial project area.
Persoonia pungens	Proteaceae	P3		Habit: Erect to decumbent or almost prostrate, lignotuberous shrub, 0.2-0.8 metres high. Flower colour: Yellow Flowering period (indicated in green): J F M A M J J A **S O N D** Soils: Occurs on white or yellow sand, and is found often over laterite. IBRA Distribution: AW,GS Florabase records: 16	HIGH Previously recorded within the mine site area, located on flat sandy areas. Occurs mianly north of Watheroo and south-east of Wongan Hills.
Persoonia rudis	Proteaceae	P3		Habit: Erect, often spreading shrub, 0.2-1 m high. Flower colour: Yellow Flowering period (indicated in green): **J** F M A M J J A **S O N D** Soils: Occurs on white, grey or yellow sand, often over laterite. IBRA Distribution: GS,JF,SCP Florabase records: 41	LOW Chance to find Persoonia on the bottom of the bore field plot near river. Not in initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Petrophile biternata	Proteaceae	P3		Habit: Stout, rigid, non-lignotuberous shrub, 0.8-1.5 metres high. Flower colour: Yellow/cream-yellow Flowering period (indicated in green): J F M A M J J **A S O** N D Soils: Occurs on yellow to grey sand and gravel, with laterite, and quartzite soils. This species can also be found located on lateritic ridges and plains. IBRA Distribution: AW,GS,JF,SCP Florabase records: 23	MEDIUM Occurs in close proximity south of the proposed paleo channel in similar topography as the area. Not in initial project area.
Petrophile plumosa	Proteaceae	P3		Habit: Erect, compact shrub, 0.3-1.3 metres high. Flower colour: Yellow Flowering period (indicated in green): J F M A M J **J A S O N** D Soils: Occurs in red to brown laterite and loamy soils, on sandplains and Hills. IBRA Distribution: JF,SCP Florabase records: 20	HIGH Previously recorded within the proposed bore field on red and brown laterite. Not in initial project area.
Phebalium brachycalyx	Rutaceae	P3		Habit: Shrub, 0.4-1.5 metres high. Flower colour: Yellow-cream-white Flowering period (indicated in green): J F M A M J J **A S** O N D Soils: Occurs within sand and gravelly soils, on lateritic uplands and Hills. IBRA Distribution: AW,COO,M Florabase records: 21	LOW On Wongan Hills and further south-east and north of Wongan Hills. Not in initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Podotheca pritzelii	Asteraceae	P3		Habit: Ascending to erect, succulent annual, herb, 0.05-0.25 metres high. Flower colour: Yellow-orange Flowering period (indicated in green): J F M A M J J A **S** **O** N D Soils: Occurs on sand ridges and in salt flats. IBRA Distribution: AW,GS,Y Florabase records: 18	MEDIUM Other side of salt lake near mine site. Possibility as near initial project area on salt flats.
Schoenus capillifolius	Cyperaceae	P3		Habit: Semi-aquatic tufted annual, grass-like or herb (sedge), 0.05 metres high. Flower colour: Green Flowering period (indicated in green): J F M A M J J A S **O** **N** D Soils: Occurs in brown mud within claypans. IBRA Distribution: AW,JF,SCP Florabase records: 27	LOW Not near the sites, occurs mainly south of Mogumber and southwards.
Schoenus pennisetis	Cyperaceae	P3		Habit: Tufted annual, grass-like or herb (sedge), 0.05-0.15 metres high. Flower colour: Purple-black Flowering period (indicated in green): J F M A M J J **A** **S** O N D Soils: Occurs on grey or peaty sand and sandy clay, within swamps or winter-wet depressions. IBRA Distribution: AW,GS,JF,SCP Florabase records: 42	LOW On Wongan Hills and otherwise west of Cataby and also near Perth.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Stylidium periscelianthum	Stylidiaceae	P3		Habit: Bulb-forming perennial, herb, 0.07-0.15 metres high. Flower colour: Pink Flowering period (indicated in green): J F M A M J J A **S** **O** N D Soils: Found in loamy clay and moist soils pockets, within wet flats and low granitic Hills. IBRA Distribution: AW,GS,JF,SCP Florabase records: 24	MEDIUM Previously recorded in the proposed bore field near, Moore River. Occurs near Wongan Hills and then from Bakers Hill to Green Head.
Stylidium sacculatum	Stylidiaceae	P3		Habit: Creeping perennial, herb, 0.05-0.15 metres high Flower colour: White-pink Flowering period (indicated in green): J F M A M J J A S **O** **N** D Soils: Occurs on clayey sand or sand, on lower slopes and flats. IBRA Distribution: AW,JF,SCP Florabase records: 19	HIGH Previously recorded at the mine site and within the proposed bore field, and has been recorded along Moore river.
Styphelia tamminensis	Ericaceae	P3		Habit: Low spreading shrub 20 cm high x 30 cm Flower colour: White Flowering period (indicated in green): J F M **A** M J J A S O N D Soils: Occurs within sand over laterite. IBRA Distribution: AW,GS Florabase records: 19	LOW Recorded on Wongan Hills and then north and south-east of Wongan Hills. Not in initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Synaphea constricta	Proteaceae	P3		Habit: Compact, tufted shrub, 0.2-0.5 m high. Flower colour: Yellow Flowering period (indicated in green): J F M A M **J J A S** O N D Soils: Occurs on sand or sandy clay-loam over laterite. IBRA Distribution: AW,M Florabase records: 32	LOW Chance just on Wongan Hills and southeast of Wongan Hills. Not n initial project area.
Tetratheca retrorsa	Elaeocarpaceae	P3		Habit: Spindly, spreading, and sparsely-leaved shrub, to 1.5 metres high. Flower colour: Pink Flowering period (indicated in green): J F M A M J J A **S O** N D Soils: Occurs on lateritic breakaways. IBRA Distribution: AW,JF Florabase records: 17	LOW On Wongan Hills. Not in initial project area.
Thomasia tenuivestita	Malvaceae	P3		Habit: Shrub, 0.6-2.5 metres high. Flower colour: Purple-pink Flowering period (indicated in green): J F M A M J **J A S O** N D Soils: Occurs in granite and loam. IBRA Distribution: AW,GS,JF,M Florabase records: 33	LOW On Wongan Hills. Not in initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Verticordia huegelii var. *tridens*	Myrtaceae	P3		Habit: Shrub, 0.15-0.6 metres high. Flower colour: Green-yellow/red Flowering period (indicated in green): J F M A M J J A S O N D Soils: Occurs on sandy or gravelly loam, within winter-wet areas and low Hills. IBRA Distribution: AW,EP,JF,SCP Florabase records: 32	LOW On Wongan Hills and north of Calingiri and Mogumber but more widespread.
Verticordia insignis subsp. eomagis	Myrtaceae	P3		Habit: Erect shrub, 0.2-1(-1.5) m high. Flower colour: White-pink/white Flowering period (indicated in green): J F M A M J J A S O N D Soils: Sandy soils over laterite. Sandplains, rocky rises. IBRA Distribution: AVW, GAS, SWA Florabase records: 38	LOW Recorded mainly to northwest of Moora and Watheroo. Not in initial project area.
Verticordia muelleriana subsp. *muelleriana*	Myrtaceae	P3		Habit: Spindly shrub, 0.45-2(-3.5) metres high. Flower colour: Pink-purple-red/brown Flowering period (indicated in green): J F M A M J J A S O N D Soils: Occurs white and/ or grey or yellow sand on sandplains. IBRA Distribution: AW,GS,JF Florabase records: 44	LOW Mainly north of Watheroo, occasional near Mogumber. Not in initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Verticordia venusta	Myrtaceae	P3		Habit: Erect, spreading shrub, 0.2-2 m high Flower colour: Fl. pink-purple/red-brown Flowering period (indicated in green): **J** F M A M J J A **S** **O** **N** **D** Soils: Yellow sand, sandy gravel. Sandplains IBRA Distribution: AW,GS Florabase records: 92	MEDIUM Recorded previously on the border of the mine site near Lake Ninan.
Acacia alata var. *platyptera*	Fabaceae	P4		Habit: Dense shrub, 0.5-1 metres high. Flower colour: Yellow Flowering period (indicated in green): J F M A M **J** **J** **A** S O N D Soils: Occurs on clay and gravelly sandy clay, on lateritic ridges and clay flats. IBRA Distribution: AW,JF,SCP Florabase records: 33	HIGH Previously recorded in the Nature reserve near the proposed bore field, and surrounds. Not in initial project area.
Acacia botrydion	Fabaceae	P4		Habit: Intricately branched, diffuse, spinose shrub, 0.3-1.5 metres high. Flower colour: Yellow Flowering period (indicated in green): J F M A M J **J** **A** **S** O N D Soils: Occurs on gravelly lateritic soils and Hillslopes. IBRA Distribution: AW Florabase records: 19	LOW On Wongan Hills. Not in initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Acacia semicircinalis	Fabaceae	P4		Habit: Prostrate to ascending, wiry, diffuse shrub, 0.3-1 metres high. Flower colour: Yellow Flowering period (indicated in green): **J** F M A M J **J** **A** **S** **O** **N** **D** Soils: Occurs on gravelly soils and laterite on Hillslopes. IBRA Distribution: AW Florabase records: 20	LOW On Wongan Hills. Not in initial project area.
Anigozanthos humilis subsp. *chrysanthus*	Haemodoraceae	P4		Habit: Rhizomatous, perennial, herb, 0.2-0.4(-0.8) metres high. Flower colour: Yellow Flowering period (indicated in green): J F M A M J **J** **A** **S** **O** N D Soils: Occurs on grey or yellow sand. IBRA Distribution: AW,GS,JF,SCP Florabase records: 64	HIGH Multiple specimens recorded in the proposed bore field and has also been recorded close to the south western boundary of the mine site
Asterolasia grandiflora	Rutaceae	P4		Habit: Slender open shrub, 0.2-0.6(-0.8) m high. Flower colour: Pink/white Flowering period (indicated in green): J F M A M J **J** **A** **S** **O** N D Soils: Lateritic soils, clay over granite. Breakaways, hills. IBRA Distribution: AVW, JAF Florabase records: 68	LOW Mainly south of project area towards Northam. Not in initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Banksia bella	Proteaceae	P4		Habit: Dense, sprawling, non-lignotuberous shrub, 0.4-2 metres high. Flower colour: Yellow Flowering period (indicated in green): J F M A M J J A S **O** N D Soils: Occurs on gravelly lateritic clay and laterite. IBRA Distribution: AW Florabase records: 21	LOW On the Wongan Hills. Not in the initial project area.
Banksia comosa	Proteaceae	P4		Habit: Erect, compact, non-lignotuberous shrub, 0.9-2 metres high. Flower colour: Cream-yellow Flowering period (indicated in green): J F M A M J J **A S O** N D Soils: lay, laterite, gravel. IBRA Distribution: AW Florabase records: 18	LOW On the Wongan Hills. Not in the initial project area.
Banksia wonganensis	Proteaceae	P4		Habit: Sprawling to erect, non-lignotuberous shrub, 1.8-3 metres high, to 3 metres wide. Flower colour: Cream-yellow Flowering period (indicated in green): J F M A M J J **A S O** N D Soils: Occurs on gravelly loam and lateritic rises. IBRA Distribution: AW Florabase records: 19	LOW Mainly on Wongan Hills, No in initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Calothamnus accedens	Myrtaceae	P4		Habit: Erect & slender shrub, to 1.8 metres high. Flower colour: Pink-red. Flowering period (indicated in green): J F M **A** M J J A S O **N** **D** Soils: Occurs on sandy soils over laterite and on road verges. IBRA Distribution: AW,GS,JF,SCP Florabase records: 39	LOW North of the pipeline and Yerecoin. Not in initial project area.
Calothamnus pachystachyus	Myrtaceae	P4		Habit: Erect, much-branched, often straggly shrub, (0.3-) 0.6-1.7 metres high. Flower colour: Red-brown-black Flowering period (indicated in green): J F M A M J J **A** **S** **O** N D Soils: Occurs on lateritic soils, often gravelly. Located on ridges and road verges. IBRA Distribution: AW,JF,SCP Florabase records: 36	HIGH Recorded in the proposed bore field area. Not in initial project area.
Daviesia spiralis	Fabaceae	P4		Habit: Intricate, rounded shrub, 0.45-1.5 metres high. Flower colour: Yellow/orange & red/brown Flowering period (indicated in green): **J** F M A M J J **A** **S** **O** **N** **D** Soils: Occurs on gravelly lateritic clay and sand. IBRA Distribution: AW Florabase records: 16	LOW Recorded on Wongan Hills to the North West. Not in initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Eucalyptus × carnabyi	Myrtaceae	P4		Habit: Mallee, 1.5-6 metres high, bark smooth, grey over cream. Flower colour: Pink-cream Flowering period (indicated in green): J F M A M J J A S **O N** D Soils: Occurs in grey sand and sandy loam, on lateritic ridges. IBRA Distribution: AW,GS Florabase records: 29	LOW Potentially near western end of pipeline. Not in initial project area.
Frankenia glomerata	Frankeniaceae	P4		Habit: Prostrate shrub. Flower colour: Pink-white Flowering period (indicated in green): J F M A M J J A S O **N** D Soils: White sand. IBRA Distribution: AVW, COO, EP, GAS, GES, GVD, LSD, MAL Florabase records: 67	LOW May occur on white sandy soils near project area, mainly occurs south of Goomalling.
Grevillea drummondii	Proteaceae	P4		Habit: Spreading to erect shrub, 0.2-2(-2.5) metres high. Flower colour: Cream, yellow and red Flowering period (indicated in green): J F M A M **J J A S** O N D Soils: Occurs on lateritic soils (sandy clay, gravel, loam, sand), sand over granite. Occurs on rocky Hillsides, boulders, granite outcrops. IBRA Distribution: AW,GS,JF,SCP Florabase records: 26	MEDIUM Has been previously recorded in close proximity to the potential bore field. Not in initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Hibbertia miniata	Dilleniaceae	P4		Habit: Decumbent or erect shrub, 0.1-1 metres high. Flower colour: Orange/orange-red Flowering period (indicated in green): J F M A M J J **A S O N** D Soils: Occurs on lateritic gravelly soils. IBRA Distribution: JF,SCP Florabase records: 53	LOW Chance with species located on other side of river near bore field. Not in initial project area.
Hydrocotyle lemnoides	Araliaceae	P4		Habit: Aquatic, floating annual, herb. Flower colour: Purple Flowering period (indicated in green): J F M A M J J **A S O** N D Soils: occurs in swamps. IBRA Distribution: AW,GS,JF,SCP Florabase records: 26	LOW South of the pipeline and proposed mine site. Not in the initial project area.
Lepidobolus densus	Restionaceae	P4		Habit: Rhizomatous, caespitose perennial, herb (sedge-like), to 0.4 metres high. Flower colour: Dark Red to Brown Flowering period (indicated in green): J F M A M J J **A** S O N D Soils: Occurs in yellow lateritic sand and/or lateritic gravel, on dry kwongan. IBRA Distribution: AW,EP,GS,JF,SCP,Y Florabase records: 29	LOW Has been recorded previously in close proximity to the paleo channel (north of Mogumber). Not in the initial project area.

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Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Loxocarya albipes	Restionaceae	P4		Habit: Rhizomatous, densely tufted, decumbent perennial, herb (sedge-like), 0.5-0.8 metres high, to 1.5 metres wide. Flower colour: Brown Flowering period (indicated in green): J F M A M J J **A** **S** O N D Soils: Occurs on lateritic gravel in dry heath. IBRA Distribution: AW Florabase records: 7	LOW Recorded on Wongan Hills. Not in initial project area.
Persoonia sulcata	Proteaceae	P4		Habit: Erect, spreading to decumbent shrub, 0.2-1 metres high. Flower colour: Yellow Flowering period (indicated in green): J F M A M J J A S O N D Soils: Occurs on lateritic or granitic soils. IBRA Distribution: AW,GS,JF,SCP Florabase records: 39	MEDIUM Previously recorded in the Koodjee Nature Reserve, 5 km N Gillingarra, which is located near the proposed bore field. Not in initial project area.
Regelia megacephala	Myrtaceae	P4		Habit: Shrub, 2-5 metres high. Flower colour: Purple-red Flowering period (indicated in green): J F M A M J J A S O N D Soils: Occurs on red sand on quartzite Hills. IBRA Distribution: AW,SCP Florabase records: 17	LOW Up and down the river from near the potential bore field. Not in the initial project area.

APPENDIX D: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN THE CARAVEL COPPER PROJECT SURVEY AREA

Note: Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt;; COO – Coolgardie; ESP – Esperance Plains; GAS- Gascoyne; GES – Geraldton Sandplains; GVD- Great Victorian Desert; JAF – Jarrah Forest; LSD- Little Sandy Desert; MAL – Mallee; NJF – Northern Jarrah Forrest; SWA – Swan Coastal Plain; YAL – Yalgoo. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking. Note: The "initial project area" does not include the potential bore field near Moore River.

Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Schoenus natans	Cyperaceae	P4		Habit: Aquatic annual, grass-like or herb (sedge), 0.3 metres high. Flower colour: Brown Flowering period (indicated in green): J F M A M J J A S **O** N D Soils: Located on winter-wet depressions. IBRA Distribution: AW,GS,JF,SCP,W Florabase records: 66	LOW South of the potential bore field. Not in initial project area.
Stylidium longitubum	Stylidiaceae	P4		Habit: Erect annual (ephemeral), herb, 0.05-0.12 metres high. Flower colour: Pink Flowering period (indicated in green): J F M A M J J A S **O** **N** **D** Soils: Occurs on sandy clay or clay in seasonal wetlands. IBRA Distribution: GS,JF,SCP Florabase records: 46	MEDIUM Previously recorded near the potential bore field area. Not in initial project area.
Synaphea grandis	Proteaceae	P4		Habit: Tufted shrub, ca 0.3 m high. Flower colour: Yellow Flowering period (indicated in green): J F M A M J J A S **O** **N** D Soils: Laterite. IBRA Distribution: AVW, JAF, SWA Florabase records: 38	LOW Occurs mainly south of project area, may occur near pipeline near New Norcia area. Not in initial project area.

APPENDIX D: ASSESSMENT OF THREATENED AND PRIORITY FLORA POTENTIALLY PRESENT IN THE CARAVEL COPPER PROJECT SURVEY AREA

Note: Refer to Appendix A for State (SCC; Department of Biodiversity, Conservation and Attractions 2017a) and Federal (FCC; EPBC Act) conservation code definitions. IBRA Distribution: AVW – Avon Wheatbelt;; COO – Coolgardie; ESP – Esperance Plains; GAS- Gascoyne; GES – Geraldton Sandplains; GVD- Great Victorian Desert; JAF – Jarrah Forest; LSD- Little Sandy Desert; MAL – Mallee; NJF – Northern Jarrah Forrest; SWA – Swan Coastal Plain; YAL – Yalgoo. Likelihood of occurrence in survey area is based on a Low, Moderate or High ranking. Note: The "initial project area" does not include the potential bore field near Moore River.

Species	Family	SCC	FCC	Description and Habitat	Likelihood of Occurrence
Verticordia lindleyi subsp. lindleyi	Myrtaceae	P4		Habit: Erect shrub, 0.2-0.75 metres high. Flower colour: Pink Flowering period (indicated in green): J F M A M J J A S O N D Soils: Occurs on sand or sandy clay, in winter-wet depressions. IBRA Distribution: GS,JF,SCP Florabase records: 82	LOW South of the pipeline, and south of potential bore field. Not in the initial project area.

APPENDIX E: SUMMARY OF THREATENED AND PRIORITY VASCULAR PLANT SPECIES RECORDED AT CARAVEL COPPER PROJECT 2018, 2021

Note: CC refers to conservation code (State/Federal); T denotes threatened flora; EN denotes endangered flora; VU denotes vulnerable flora; P1-P4 denote priority flora (DPaW 2019).

SPECIES	CC	EASTING	NORTHING	SITE LOCATION	SPECIES COUNT
Banksia serratuloides subsp. *serratuloides*	T	406939	6581919	KR09	1
		406754	6582287	KR11	1
Calothamnus pachystachyus	P4	406939	6581919	KR09	80
		406754	6582287	KR11	45
Chamelaucium sp. *Wongan Hills* (B.H. Smith 1140)	P3	463792	6574920	MS29	1
		463765	6574921	OPPO	1
		406603	6582182	KR05	1
Eucalyptus arachnaea subsp. *arrecta*	P3	464392	6567137	OPPO	1
		464362	6567185	MS03	1
Eucalyptus macrocarpa subsp. *elachantha*	P4	456490	6566182	OPPO	4
		452804	6571043	PL29	7
		457036	6571062	PL31	43
Petrophile plumosa	P3	406939	6581919	KR09	1
Stylidium sp. Moora (J.A. Wege 713)	P2	406961	6581826	KR08	1
		406939	6581919	KR09	1

APPENDIX F: SUMMARY OF INTRODUCED SPECIES RECORDED IN THE CARAVEL COPPER PROJECT AREA, ALL YEARS (2018 AND 2021)

Note: Data is from 2018 and 2021 records. 1 DBCA = DPaW (2013) weed ranking category for the Wheatbelt region where EI = Ecological Impact Rating: L - Low, M - Medium, H - High, U - Unknown; I = Invasiveness Rating: S - Slow, M - Moderate, R - Rapid, U - Unknown. 2 WAOL = Western Australian Organism List (DPIRD 2022)

FAMILY	SPECIES	DBCA 1		WAOL 2	NATURE MAP	AREA		
		EI	I			KOODJEE NATURE RESERVE	MINE FOOTPRINT	PIPELINE
AIZOACEAE	*Carpobrotus* sp.	U	U	Unknown			X	
	Mesembryanthemum nodiflorum	H	R	Permitted-s11	X		X	X
ASTERACEAE	*Arctotheca calendula*	H	R	Permitted-s11	X	X	X	X
	Centaurea melitensis	M	R	Permitted-s11			X	
	Cotula bipinnata	U	R	Permitted-s11	X	X	X	X
	Cotula coronopifolia	U	R	Permitted-s11	X	X	X	
	Hypochaeris glabra	U	R	Permitted-s11	X	X	X	X
	Hypochaeris radicata	U	R	Permitted-s11		X		
	Leontodon rhagadioloides	U	U	Unknown		X		
	Monoculus monstrosus	U	R	Permitted-s11	X		X	X
	Sonchus oleraceus	U	R	Permitted-s11	X	X	X	X
	Ursinia anthemoides	U	R	Permitted-s11	X	X	X	X
BRASSICACEAE	*Brassica ×napus*	U	U	Unknown			X	X
	Brassica tournefortii	U	R	Permitted-s11	X		X	X
	Brassica sp.	U	U	Unknown		X	X	
	Raphanus raphanistrum	U	R	Permitted-s11			X	X
CAMPANULACEAE	*Wahlenbergia capensis*	U	R	Permitted-s11	X	X		
CARYOPHYLLACEAE	*Petrorhagia dubia*	U	R	Permitted-s11	X	X		
	Silene gallica	U	R	Permitted-s11		X		
	Silene gallica var. *gallica*	U	R	Permitted-s11		X		
	Spergula pentandra	U	R	Permitted-s11		X		
	Spergularia rubra	U	R	Permitted-s11		X	X	
FABACEAE	*Lupinus angustifolius*	L	S	Permitted-s11		X		
	Lupinus cosentinii	U	S	Permitted-s11			X	
	Medicago polymorpha	U	U	Permitted-s11		X	X	X
	Medicago truncatula	U	U	Permitted-s11		X		
	Trifolium arvense	U	U	Permitted-s11			X	
	Trifolium glomeratum	U	U	Permitted-s11			X	
	Trifolium subterraneum	U	U	Permitted-s11			X	
	Trifolium sp.	U	U	Permitted-s11		X		
GENTIANACEAE	*Centaurium erythraea*	U	U	Permitted-s11		X		
GERANIACEAE	*Erodium botrys*	L	M	Permitted-s11	X	X	X	
IRIDACEAE	*Gladiolus caryophyllaceus*	H	R	Permitted-s11		X		
	Moraea flaccida	H	R	DeclaredPest-s22(2)			X	X
	Moraea setifolia	H	R	Permitted-s11	X	X		
	Romulea rosea	H	R	Permitted-s11	X	X	X	X
JUNCACEAE	*Juncus acutus*	H	R	Permitted-s11	X		X	X

APPENDIX F: SUMMARY OF INTRODUCED SPECIES RECORDED IN THE CARAVEL COPPER PROJECT AREA, ALL YEARS (2018 AND 2021)

Note: Data is from 2018 and 2021 records. 1 DBCA = DPaW (2013) weed ranking category for the Wheatbelt region where EI = Ecological Impact Rating: L - Low, M - Medium, H - High, U - Unknown; I = Invasiveness Rating: S - Slow, M - Moderate, R - Rapid, U - Unknown. 2 WAOL = Western Australian Organism List (DPIRD 2022)

FAMILY	SPECIES	DBCA 1		WAOL 2	NATURE MAP	AREA		
		EI	I			KOODJEE NATURE RESERVE	MINE FOOTPRINT	PIPELINE
OROBANCHACEAE	*Bellardia trixago*	U	U	Permitted-s11	X		X	
	Orobanche minor	M	R	Permitted-s11		X		
	Parentucellia latifolia	U	R	Permitted-s11	X	X		
OXALIDACEAE	*Oxalis corniculata*	U	U	Permitted-s11	X		X	X
	Oxalis pes-caprae	H	S	Permitted-s11		X		
POACEAE	*Aira caryophyllea*	H	R	Permitted-s11	X	X	X	
	Avena barbata	H	R	Permitted-s11	X		X	X
	Avena fatua	H	R	Permitted-s11	X	X	X	X
	Brachypodium distachyon	U	U	Permitted-s11		X		
	Briza maxima	H	R	Permitted-s11	X	X	X	X
	Briza minor	H	R	Permitted-s11	X	X		
	Bromus diandrus	H	R	Permitted-s11	X		X	X
	Bromus hordeaceus	H	R	Permitted-s11		X	X	
	Bromus rubens	H	R	Permitted-s11	X	X	X	
	Bromus sp.	U	U	Unknown			X	
	Cynodon dactylon	H	S	Permitted-s11	X	X		
	Ehrharta calycina	H	M	Permitted-s11	X	X	X	X
	Ehrharta longiflora	U	M	Permitted-s11	X	X	X	
	Ehrharta sp.	U	U	Unknown			X	
	Eragrostis curvula	H	M	Permitted-s11			X	X
	Hordeum glaucum	U	R	Permitted-s11			X	
	Hordeum leporinum	U	R	Permitted-s11		X	X	
	Hordeum sp.	U	U	Unknown		X		
	Lolium perenne	U	M	Permitted-s11			X	X
	Lolium rigidum	U	M	Permitted-s11	X	X	X	X
	Parapholis incurva	U	U	Permitted-s11	X		X	
	Pentameris airoides	U	U	Permitted-s11		X	X	
	Triticum aestivum	U	U	Permitted-s11	X			X
	Vulpia muralis	U	R	Permitted-s11	X		X	
	Vulpia myuros forma myuros	U	R	Permitted-s11	X	X		
	Poaceae sp.	U	U	Unknown			X	
	Poaceae sp. 1	U	U	Unknown			X	
	Poaceae sp. 2	U	U	Unknown			X	
PRIMULACEAE	*Lysimachia arvensis*	U	R	Permitted-s11	X	X	X	
SCROPHULARIACEAE	*Zaluzianskya divaricata*	U	R	Permitted-s11	X		X	
SOLANACEAE	*Solanum nigrum*	U	R	Permitted-s11	X	X		

APPENDIX G: SUMMARY OF VASCULAR PLANT SPECIES RECORDED AT THE CARAVEL COPPER PROJECT AREA, 2018 & 2021

Note * denotes introduced species.

SCC denotes State Conservation Code (see Appendix A for definitions).

FAMILY	SPECIES	KOODJEE RESERVE	MINE SITE	PIPELINE
Aizoaceae	* *Carpobrotus* sp.		X	
	* *Mesembryanthemum nodiflorum*		X	X
Allocasuarina	*Allocasuarina acutivalvis*		X	
	Allocasuarina campestris	X	X	X
	Allocasuarina huegeliana		X	X
	Allocasuarina humilis	X		
	Allocasuarina microstachya		X	
Amaranthaceae	*Ptilotus declinatus*		X	
	Ptilotus drummondii			X
	Ptilotus drummondii var. *drummondii*		X	
	Ptilotus halophilus		X	
	Ptilotus holosericeus		X	
	Ptilotus humilis	X		
	Ptilotus manglesii	X	X	
	Ptilotus polystachyus	X	X	X
	Ptilotus spathulatus		X	
	Ptilotus sp.		X	
	Quinetia urvillei		X	
Anarthriaceae	*Lyginia imberbis*	X		
Apiaceae	*Apium annuum*		X	
	Apium ?annuum		X	
	Apium ?prostratum		X	
	Platysace maxwellii	X		
	Xanthosia sp.		X	
Araliaceae	*Hydrocotyle callicarpa*	X		
	Hydrocotyle intertexta		X	
	Trachymene cyanopetala	X	X	X
	Trachymene ornata	X	X	X
	Trachymene ?ornata	X		
	Trachymene pilosa	X	X	
Asparagaceae	*Acanthocarpus canaliculatus*	X	X	
	Arthropodium curvipes		X	
	Dichopogon capillipes	X		
	Laxmannia ramosa	X		
	Laxmannia sessiliflora subsp. *drummondii*	X		
	Lomandra caespitosa	X		
	Lomandra collina		X	
	Lomandra sp.		X	X
	Sowerbaea laxiflora	X		
	Thysanotus ?triandrus	X		
	Thysanotus dichotomus		X	
	Thysanotus manglesianus	X		

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FAMILY	SPECIES	KOODJEE RESERVE	MINE SITE	PIPELINE
Asparagaceae	*Thysanotus patersonii*	X	X	
(Cont.)	*Thysanotus* sp.	X	X	
	Thysanotus sp. (climbing)	X		
Asphodelaceae	*Bulbine semibarbata*		X	
Asteraceae	*Actinobole uliginosum*		X	
	Angianthus tomentosus		X	
	* *Arctotheca calendula*	X	X	X
	Blennospora drummondii	X	X	
	Brachyscome bellidioides	X	X	
	Brachyscome iberidifolia		X	
	Brachyscome perpusilla		X	
	Brachyscome pusilla		X	
	Brachyscome sp.		X	
	* *Centaurea melitensis*		X	
	* *Cotula bipinnata*	X	X	X
	* *Cotula coronopifolia*	X	X	
	Cotula cotuloides		X	
	Erigeron sp.		X	
	Erymophyllum ramosum subsp. *ramosum*		X	
	Gnephosis angianthoides		X	
	Gnephosis drummondii		X	
	Gnephosis tenuissima	X	X	
	Gnephosis tridens		X	
	Helichrysum ?leucopsideum		X	
	Helichrysum leucopsideum		X	
	Hyalochlamys globifera		X	
	Hyalosperma cotula	X		
	Hyalosperma demissum	X	X	X
	Hyalosperma glutinosum subsp. *glutinosum*		X	
	* *Hypochaeris glabra*	X	X	X
	* *Hypochaeris radicata*	X		
	Lawrencella rosea	X		
	* *Leontodon rhagadioloides*	X		
	* *Monoculus monstrosus*		X	X
	Olearia sp.*eremicola (Diels & Pritzel s.n. PERTH 00449628)*		X	
	Olearia sp.		X	
	Panaetia lessonii	X	X	X
	Pimelea sp.	X		
	Podolepis aristata subsp. *aristata*		X	
	Podotheca angustifolia	X	X	
	Podotheca gnaphalioides	X	X	
	Podotheca sp.		X	
	Pogonolepis muelleriana		X	
	Pogonolepis stricta		X	
	Pterochaeta paniculata	X		

APPENDIX G: SUMMARY OF VASCULAR PLANT SPECIES RECORDED AT THE CARAVEL COPPER PROJECT AREA, 2018 & 2021

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FAMILY	SPECIES	KOODJEE RESERVE	MINE SITE	PIPELINE
Asteraceae	*Rhodanthe chlorocephala* subsp. *rosea*	X		
(Cont.)	*Rhodanthe laevis*	X		
	Rhodanthe manglesii		X	
	Rhodanthe citrina			X
	Senecio lacustrinus		X	
	Senecio pinnatifolius var. *pinnatifolius*		X	
	Siemssenia capillaris		X	
	* *Sonchus oleraceus*	X	X	X
	* *Ursinia anthemoides*	X	X	X
	Waitzia acuminata		X	
	Waitzia acuminata var. *acuminata*		X	X
	Waitzia acuminata var. *albicans*	X		
	Waitzia nitida		X	
	Asteraceae sp.	X	X	
Boraginaceae	*Halgania anagalloides*		X	
Boryaceae	*Borya sphaerocephala*	X	X	X
Brassicaceae	* *Brassica ×napus*		X	X
	* *Brassica tournefortii*		X	X
	* *Brassica* sp.	X	X	
	* *Raphanus raphanistrum*		X	X
	Stenopetalum sphaerocarpum		X	
Campanulaceae	*Lobelia* ?*rhytidosperma*		X	
	Lobelia heterophylla		X	
	?*Lobelia* sp.	X		
	* *Wahlenbergia capensis*	X		
	Wahlenbergia gracilenta	X	X	
	Wahlenbergia sp.	X		
Caryophyllaceae	* *Petrorhagia dubia*	X		
	* *Silene gallica*	X		
	* *Silene gallica* var. *gallica*	X		
	* *Spergula pentandra*	X		
	Spergularia marina	X	X	
	* *Spergularia rubra*	X	X	
Casuarinaceae	*Casuarina obesa*		X	X
Celastraceae	*Stackhousia* sp. Hairy fruited (E.N.S. Jackson 1387)		X	
Centrolepidaceae	*Centrolepis aristata*		X	
	Centrolepis pilosa	X	X	
Chenopodiaceae	*Atriplex codonocarpa*		X	
	Atriplex lindleyi subsp. *inflata*	X	X	
	Atriplex semibaccata		X	

APPENDIX G: SUMMARY OF VASCULAR PLANT SPECIES RECORDED AT THE CARAVEL COPPER PROJECT AREA, 2018 & 2021

Note * denotes introduced species.

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FAMILY	SPECIES	KOODJEE RESERVE	MINE SITE	PIPELINE
Chenopodiaceae	*Atriplex* sp.		X	X
(Cont.)	*Didymanthus roei*		X	
	Enchylaena lanata		X	X
	Maireana brevifolia		X	X
	Maireana carnosa		X	
	Maireana enchylaenoides		X	
	Maireana marginata		X	
	Maireana sp.		X	X
	Rhagodia drummondii		X	
	Rhagodia preissii subsp. *preissii*		X	X
	Rhagodia sp. Watheroo (R.J. Cranfield & P.J. Spencer 8183)		X	
	Salsola australis		X	
	Sclerolaena diacantha		X	
	Sclerolaena eurotioides		X	
	Tecticornia indica subsp. *bidens*		X	
	Tecticornia lepidosperma	X	X	
	Tecticornia pergranulata subsp. *pergranulata*		X	
	Tecticornia sp.			X
	Tecticornia sp. 1	X	X	
	Tecticornia sp. 2	X		
	Tecticornia sp. 3		X	
	Chenopodiaceae sp.		X	X
Colchicaceae	*Burchardia congesta*	X		X
Convolvulaceae	*Wilsonia humilis*		X	
Crassulaceae	*Crassula colorata*		X	
	Crassula colorata var. *acuminata*		X	
	Crassula colorata var. *colorata*	X		
	Crassula exserta		X	
	Crassula sp.		X	
Cupressaceae	*Callitris arenaria*		X	
	Callitris roei		X	
Cyperaceae	*Caustis dioica*	X		
	Chaetospora curvifolia	X		
	Isolepis cernua		X	
	Isolepis marginata		X	
	Lepidosperma ?tenue sens. lat.		X	
	Lepidosperma asperatum		X	
	Lepidosperma costale sens. lat.		X	X
	Lepidosperma longitudinale sens. lat.		X	
	Lepidosperma sp.	X	X	X
	Machaerina articulata		X	
	Machaerina juncea		X	

APPENDIX G: SUMMARY OF VASCULAR PLANT SPECIES RECORDED AT THE CARAVEL COPPER PROJECT AREA, 2018 & 2021

Note * denotes introduced species.

SCC denotes State Conservation Code (see Appendix A for definitions).

FAMILY	SPECIES	KOODJEE RESERVE	MINE SITE	PIPELINE
Cyperaceae	*Mesomelaena pseudostygia*	X		
(Cont.)	*Morelotia octandra*	X		
	Schoenus ?sp. smooth culms (K.R. Newbey 7823)	X		
	Schoenus brevisetis	X		
	Schoenus clandestinus	X	X	
	Schoenus nanus	X		
	Schoenus ?nanus	X		
	Schoenus sp.			X
Dasypogonaceae	*Calectasia narragara*	X		
Dilleniaceae	*Hibbertia aff. diamesogenos*			X
	Hibbertia ?exasperata		X	
	Hibbertia acerosa	X		
	Hibbertia rupicola		X	
	Hibbertia striata	X		
	Hibbertia subvaginata	X		
	Hibbertia sp.	X		
Droseraceae	*Drosera humilis*	X		
	Drosera leucoblasta	X		
	Drosera menziesii	X	X	
	Drosera miniata	X	X	
	Drosera ?miniata		X	
	Drosera spilos	X		
	Drosera subhirtella	X	X	X
	Drosera sp.	X	X	
	Drosera sp. (Climbing)	X		
	Drosera sp. (Prostrate)	X		
Ecdeiocoleaceae	*Ecdeiocolea monostachya*		X	
Ericaceae	*Styphelia ?conostephioides*	X		
	Styphelia ?macrocalyx	X		
	Styphelia pallida		X	
	Styphelia serratifolia	X	X	
Fabaceae	*Acacia acuaria*		X	X
	Acacia aculeiformis		X	
	Acacia acuminata		X	X
	Acacia ?andrewsii		X	
	Acacia blakelyi	X		
	Acacia ?blakelyi		X	
	Acacia ?brumalis		X	X
	Acacia daviesioides		X	
	Acacia dielsii		X	
	Acacia dilatata		X	
	Acacia ericifolia	X		

APPENDIX G: SUMMARY OF VASCULAR PLANT SPECIES RECORDED AT THE CARAVEL COPPER PROJECT AREA, 2018 & 2021

Note * denotes introduced species.

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FAMILY	SPECIES	KOODJEE RESERVE	MINE SITE	PIPELINE
Fabaceae	*Acacia erinacea*		X	
(Cont.)	*Acacia ?jacksonioides*		X	
	Acacia lasiocarpa	X		
	Acacia ?lasiocarpa		X	
	Acacia lasiocarpa var. *sedifolia*		X	
	Acacia microbotrya		X	X
	Acacia ?multispicata			X
	Acacia neurophylla subsp. *neurophylla*		X	
	Acacia nigripilosa		X	
	Acacia nigripilosa subsp nigripilosa		X	
	Acacia orbifolia		X	
	Acacia ?oswaldii		X	
	Acacia pulchella	X		
	Acacia saligna ?subsp. *Wheatbelt (B.R. Maslin 8602)*		X	
	Acacia shuttleworthii		X	
	Acacia stenoptera	X		
	Acacia ulicina		X	
	Acacia sp.		X	X
	Aotus gracillima	X		
	Bossiaea eriocarpa	X		
	Bossiaea spinescens		X	X
	Daviesia ?divaricata	X		
	Daviesia angulata	X		
	Daviesia hakeoides subsp. *hakeoides*		X	X
	Daviesia preissii			X
	Gastrolobium callistachys		X	
	Gastrolobium calycinum		X	X
	Gastrolobium spinosum			X
	Gastrolobium trilobum	X	X	
	Gastrolobium sp.			X
	Gompholobium marginatum	X		
	Gompholobium tomentosum	X		
	Jacksonia angulata	X		
	Jacksonia fasciculata		X	
	Jacksonia floribunda		X	
	Jacksonia nutans	X		
	Jacksonia sp.		X	
	Kennedia prostrata		X	
	Labichea lanceolata	X		
	* *Lupinus angustifolius*	X		
	* *Lupinus cosentinii*		X	
	* *Medicago polymorpha*	X	X	X
	* *Medicago truncatula*	X		
	Mirbelia ramulosa		X	X
	Mirbelia trichocalyx		X	
	Sphaerolobium medium	X		
	Templetonia sulcata		X	
	* *Trifolium arvense*		X	

APPENDIX G: SUMMARY OF VASCULAR PLANT SPECIES RECORDED AT THE CARAVEL COPPER PROJECT AREA, 2018 & 2021

Note * denotes introduced species.

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FAMILY	SPECIES	KOODJEE RESERVE	MINE SITE	PIPELINE
Fabaceae	* *Trifolium glomeratum*		X	
(Cont.)	* *Trifolium subterraneum*		X	
	* *Trifolium* sp.	X		
Frankeniaceae	*Frankenia* sp.		X	
Gentianaceae	* *Centaurium erythraea*	X		
Geraniaceae	* *Erodium botrys*	X	X	
Goodeniaceae	*Brunonia australis*		X	
	Dampiera lavandulacea	X	X	X
	Dampiera ?lavandulacea		X	X
	Dampiera spicigera	X		X
	Dampiera sp.		X	X
	Goodenia berardiana	X	X	X
	Goodenia coerulea	X		
	Goodenia cycnopotamica	X	X	
	Goodenia drummondii subsp. *drummondii*	X		X
	Goodenia hassallii			X
	Goodenia micrantha	X		
	Goodenia reinwardtii	X		
	Goodenia sp.		X	
	Lechenaultia biloba			X
	Leschenaultia floribunda		X	
	Scaevola spinescens		X	
	Scaevola ?spinescens		X	
Haemodoraceae	*Anigozanthos humilis* subsp. *humilis*	X		
	Conostylis aculeata subsp. *aculeata*	X		
	Conostylis aculeata subsp. *bromelioides*		X	
	Conostylis androstemma	X		
	Conostylis crassinerva subsp. *absens*	X		
	Conostylis ?hiemalis	X		
	Conostylis prolifera	X		
	Conostylis setigera	X		
	Conostylis teretifolia subsp. *teretifolia*	X		
	Haemodorum discolor	X		
	Haemodorum laxum	X		
	Haemodorum spicatum	X		
Haemodoraceae	*Haemodorum* sp.		X	
Haloragaceae	*Glischrocaryon aureum*	X	X	X
	Glischrocaryon flavescens		X	
	Gonocarpus cordiger			X
	Gonocarpus nodulosus	X		

APPENDIX G: SUMMARY OF VASCULAR PLANT SPECIES RECORDED AT THE CARAVEL COPPER PROJECT AREA, 2018 & 2021

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FAMILY	SPECIES	KOODJEE RESERVE	MINE SITE	PIPELINE
Hemerocallidaceae	?*Agrostocrinum* sp.	X		
	Caesia micrantha	X		
	Chamaescilla corymbosa		X	X
	Corynotheca sp.	X		
	Dianella revoluta	X	X	X
	Dianella revoluta var. *revoluta*		X	
	?*Hemerocallidaceae* sp.		X	
	Stypandra glauca	X	X	X
	Tricoryne tenella		X	
	?*Tricoryne* sp.		X	
Iridaceae	* *Gladiolus caryophyllaceus*	X		
	* *Moraea setifolia*	X		
	* *Moraea flaccida*		X	X
	Orthrosanthus laxus	X		
	* *Romulea rosea*	X	X	X
Juncaceae	* *Juncus acutus*		X	X
Juncaginaceae	*Triglochin calcitrapa*		X	
	Triglochin isingiana		X	
	Triglochin longicarpa		X	
	Triglochin minutissima		X	
	Triglochin mucronata		X	
	Triglochin sp.		X	
Lamiaceae	*Hemigenia diplanthera*	X		
Lauraceae	*Cassytha melantha*		X	
	Cassytha sp.	X	X	X
Lentibulariaceae	*Utricularia violacea*		X	
Loganiaceae	*Phyllangium ?sulcatum*	X		
	Phyllangium paradoxum	X		
Loranthaceae	*Nuytsia floribunda*	X		
Malvaceae	*Abutilon cryptopetalum*		X	
	Abutilon ?oxycarpum		X	
	Alyogyne huegelii			X
	Alyogyne hakeifolia		X	
	Guichenotia micrantha		X	
	Lasiopetalum sp.		X	
	Seringia velutina		X	
	Malvaceae sp.		X	
Montiaceae	*Calandrinia calyptrata*		X	
	Calandrinia corrigioloides	X		

APPENDIX G: SUMMARY OF VASCULAR PLANT SPECIES RECORDED AT THE CARAVEL COPPER PROJECT AREA, 2018 & 2021

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FAMILY	SPECIES	KOODJEE RESERVE	MINE SITE	PIPELINE
Montiaceae	*Calandrinia eremaea*		X	
(Cont.)	*Calandrinia eremaea* sens. lat.		X	
	Calandrinia granulifera		X	
	Calandrinia ?granulifera		X	
	Calandrinia sp.		X	X
	?*Calandrinia* sp.		X	
Myrtaceae	*Babingtonia camphorosmae*			X
	Baeckea sp.			X
	Calothamnus gilesii		X	
	Calothamnus pachystachyus (P4)	X		
	Calothamnus quadrifidus subsp. *angustifolius*			X
	Calothamnus quadrifidus subsp. *quadrifidus*	X	X	
	Calytrix depressa	X	X	X
	Calytrix flavescens	X		
	Calytrix glutinosa			X
	Calytrix leschenaultii	X	X	
	Calytrix sapphirina	X		
	Chamelaucium sp. Wongan Hills (B.H. Smith 1140) (P3)	X	X	
	Eremaea beaufortioides	X		
	Ericomyrtus serpyllifolia	X	X	X
	Ericomyrtus tenuior	X		
	Eucalyptus alipes (Planted)		X	
	Eucalyptus arachnaea subsp. *arachnaea*		X	
	Eucalyptus arachnaea subsp. *arrecta* (P3)		X	
	Eucalyptus armillata		X	
	Eucalyptus capillosa		X	
	Eucalyptus celastroides subsp. *virella*		X	
	Eucalyptus ebbanoensis subsp. *ebbanoensis*		X	
	Eucalyptus horistes		X	
	Eucalyptus leucoxylon		X	X
	Eucalyptus ?litorea (Planted)		X	
	Eucalyptus loxophleba		X	X
	Eucalyptus loxophleba subsp. *loxophleba*		X	
	Eucalyptus loxophleba subsp. *supralaevis*		X	
	Eucalyptus ?loxophleba subsp. *supralaevis*		X	
	Eucalyptus macrocarpa			X
	Eucalyptus macrocarpa subsp. *elachantha* (P4)		X	X
	Eucalyptus orthostemon		X	
	Eucalyptus pileata		X	
	Eucalyptus rigidula		X	X
	Eucalyptus rudis subsp. *rudis*	X		
	Eucalyptus salmonophloia	X	X	
	Eucalyptus ?salmonophloia		X	
	Eucalyptus todtiana	X		
	Eucalyptus virella		X	
	Eucalyptus wandoo		X	X
	Eucalyptus wandoo subsp. *wandoo*	X	X	X

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FAMILY	SPECIES	KOODJEE RESERVE	MINE SITE	PIPELINE
Myrtaceae	*Eucalyptus* ?*yilgarnensis*		X	
(Cont.)	*Eucalyptus* sp.	X		
	Eucalytpus sp. *2*		X	
	Hypocalymma angustifolium		X	X
	Hypocalymma suave		X	
	Leptospermum erubescens	X	X	
	Leptospermum oligandrum	X		
	Leptospermum roei		X	
	Melaleuca ?*acuminata*		X	
	Melaleuca acuminata subsp. *acuminata*	X		
	Melaleuca adnata		X	
	Melaleuca calyptroides	X		
	Melaleuca concreta	X	X	
	Melaleuca ?*concreta*			X
	Melaleuca cordata			X
	Melaleuca cuticularis		X	
	Melaleuca fulgens subsp. *fulgens*		X	
	Melaleuca hamulosa		X	
	Melaleuca halmaturorum		X	
	Melaleuca ?*halmaturorum*		X	
	Melaleuca lateriflora		X	
	Melaleuca laxiflora		X	
	Melaleuca marginata	X	X	
	Melaleuca radula	X	X	
	Melaleuca rhaphiophylla	X		
	Melaleuca scalena		X	
	Melaleuca seriata	X		
	Melaleuca viminea subsp. *viminea*	X	X	
	Melaleuca ?*vinnula*		X	
	Melaleuca sp.		X	
	Pericalymma ellipticum		X	X
	Scholtzia drummondii		X	
	Scholtzia laxiflora	X		
	Scholtzia parviflora	X		
	Thryptomene cuspidata		X	
	Thryptomene mucronulata		X	
	Thryptomene racemulosa		X	
	Verticordia chrysanthella	X		
	Verticordia densiflora var. *densiflora*	X		
	Verticordia huegelii var. *stylosa*	X		
Ophioglossaceae	*Ophioglossum lusitanicum*		X	
Orchidaceae	*Caladenia denticulata*		X	
	Caladenia flava		X	X
	Caladenia sp.	X		
	Diuris picta		X	
	Elythranthera brunonis	X		

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FAMILY	SPECIES	KOODJEE RESERVE	MINE SITE	PIPELINE
Orobanchaceae	* *Bellardia trixago*		X	
	* *Orobanche minor*	X		
	* *Parentucellia latifolia*	X		
Oxalidaceae	* *Oxalis corniculata*		X	X
	* *Oxalis pes-caprae*	X		
Philydraceae	*Philydrella drummondii*	X		
Phyllanthaceae	*Poranthera microphylla*	X		
Plantaginaceae	*Plantago debilis*	X	X	
Poaceae	* *Aira caryophyllea*	X	X	
	Amphipogon caricinus	X		X
	Amphipogon turbinatus	X		
	Aristida contorta		X	
	Aristida holathera	X		
	Aristida sp.		X	
	Austrostipa elegantissima	X	X	X
	Austrostipa exilis	X		
	Austrostipa hemipogon		X	X
	Austrostipa macalpinei	X		
	Austrostipa ?macalpinei	X		
	Austrostipa nitida	X	X	
	Austrostipa scabra subsp. *scabra*		X	
	Austrostipa variabilis	X		
	Austrostipa sp.		X	X
	* *Avena barbata*		X	X
	* *Avena fatua*	X	X	X
	* *Brachypodium distachyon*	X		
	* *Briza maxima*	X	X	X
	* *Briza minor*	X		
	* *Bromus diandrus*		X	X
	* *Bromus hordeaceus*	X	X	
	* *Bromus rubens*	X	X	
	* *Bromus* sp.		X	
	Cymbopogon obtectus		X	
	* *Cynodon dactylon*	X		
	* *Ehrharta calycina*	X	X	X
	* *Ehrharta longiflora*	X	X	
	* *Ehrharta* sp.		X	
	Enteropogon ramosus		X	
	* *Eragrostis curvula*		X	X
	Eragrostis dielsii		X	
	Eragrostis sp.		X	
	Eriachne ovata		X	
	* *Hordeum glaucum*		X	

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FAMILY	SPECIES	KOODJEE RESERVE	MINE SITE	PIPELINE
Poaceae	* *Hordeum leporinum*	X	X	
(Cont.)	* *Hordeum* sp.	X		
	* *Lolium perenne*		X	X
	* *Lolium rigidum*	X	X	X
	Neurachne alopecuroidea	X	X	X
	* *Parapholis incurva*		X	
	* *Pentameris airoides*	X	X	
	Rytidosperma acerosum	X		
	Rytidosperma caespitosum		X	X
	Rytidosperma setaceum	X		
	Spartochloa scirpoidea		X	
	Triodia danthonioides	X	X	
	* *Triticum aestivum*			X
	* *Vulpia muralis*		X	
	* *Vulpia myuros* forma *myuros*	X		
	Poaceae sp.		X	
	Poaceae sp. 1		X	
	Poaceae sp. 2		X	
	* Poaceae spp.		X	
Polygalaceae	*Comesperma integerrimum*	X	X	
	Comesperma scoparium		X	X
	Comesperma volubile	X	X	X
	Comesperma sp.		X	
Polygonaceae	*Muehlenbeckia adpressa*		X	
Primulaceae	* *Lysimachia arvensis*	X	X	
Proteaceae	*Adenanthos cygnorum*	X		
	Banksia ?*armata*		X	
	Banksia armata var. *armata*		X	
	Banksia attenuata	X		
	Banksia dallanneyi	X		
	Banksia fraseri	X		
	Banksia hewardiana		X	
	Banksia menziesii	X		
	Banksia prionotes	X	X	
	Banksia sclerophylla	X		
	Banksia serratuloides subsp. *serratuloides* (T)	X		
	Banksia sp.			X
	Conospermum stoechadis subsp. *stoechadis*	X		
	Grevillea ?*eriostachya*		X	
	Grevillea hakeoides subsp. *hakeoides*		X	
	Grevillea hookeriana subsp. *hookeriana*		X	
	Grevillea levis		X	
	Grevillea petrophiloides		X	
	Grevillea petrophiloides subsp. *petrophiloides*		X	X

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FAMILY	SPECIES	KOODJEE RESERVE	MINE SITE	PIPELINE
Proteaceae	*Grevillea scabra*		X	
(Cont.)	*Grevillea* sp.			X
	Hakea ?*circumalata*		X	
	Hakea ?*commutata*		X	X
	Hakea ?*erinacea*	X	X	
	Hakea gilbertii	X		X
	Hakea incrassata	X		X
	Hakea ?*invaginata*			X
	Hakea meisneriana		X	
	Hakea preissii		X	
	Hakea prostrata			X
	Hakea scoparia subsp. *scoparia*		X	
	Hakea ?*scoparia*		X	X
	Hakea sp.		X	
	Isopogon dubius	X		
	Isotropis cuneifolia subsp. *cuneifolia*	X		
	Isotropis juncea		X	
	Petrophile brevifolia	X		
	Petrophile linearis	X		
	Petrophile macrostachya	X	X	
	Petrophile plumosa (P3)	X		
	Petrophile ?*shuttleworthiana*		X	
	Stirlingia latifolia	X		
	Synaphea ?*acutiloba*	X		
	Synaphea spinulosa subsp. *spinulosa*	X		
Pteridaceae	*Cheilanthes austrotenuifolia*	X	X	X
Pterostylis	*Pterostylis* sp.	X		
Restionaceae	*Alexgeorgea nitens*	X		
	Chordifex sinuosus	X		
	?*Chordifex sinuosus*		X	
	Desmocladus asper	X	X	
	Desmocladus flexuosus			X
	Desmocladus lateriticus		X	
	Desmocladus parthenicus	X		
	Desmocladus sp.		X	
	Lepidobolus preissianus	X		
	Lepidobolus preissianus subsp. *preissianus*	X	X	
Rhamnaceae	*Cryptandra nutans*	X		
	Stenanthemum pomaderroides	X	X	X
	Trymalium ?*daphnifolium*		X	
	?*Trymalium* sp.		X	
Rubiaceae	*Opercularia vaginata*	X	X	X

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FAMILY	SPECIES	KOODJEE RESERVE	MINE SITE	PIPELINE
Rutaceae	*Cyanothamnus coerulescens* subsp. *spicatus*		X	
	Diplolaena velutina		X	
Santalaceae	*Exocarpos sparteus*			X
	Santalum acuminatum		X	X
	Santalum murrayanum		X	
	Santalum ?spicatum		X	
	Santalum sp.		X	
Sapindaceae	*Dodonaea adenophora*	X		
	Dodonaea bursariifolia		X	
	Dodonaea divaricata	X		
	Dodonaea pinifolia		X	
	Dodonaea sp. (Juvenile)	X		
	Dodonaea viscosa subsp. *angustissima*		X	
Scrophulariaceae	*Eremophila drummondii*		X	
	Eremophila lehmanniana		X	
	* *Zaluzianskya divaricata*		X	
Solanaceae	*Anthotroche pannosa*		X	
	* *Solanum nigrum*	X		
Stylidiaceae	*Levenhookia pusilla*	X		
	Levenhookia stipitata	X	X	
	Stylidium adpressum	X		
	Stylidium leptophyllum		X	
	Stylidium neglectum	X	X	
	Stylidium piliferum	X		
	Stylidium purpureum	X		
	Stylidium repens	X		
	Stylidium sp. Moora (J.A. Wege 713) (P2)	X		
	Stylidium sp.	X	X	
Surianaceae	*Stylobasium australe*		X	X
Thymelaeaceae	*Pimelea villifera*		X	
	Pimelea sp.	X		
Xanthorrhoeaceae	*Xanthorrhoea brunonis*	X		
	Xanthorrhoea preissii	X		
Zamiaceae	*Macrozamia fraseri*	X		

APPENDIX H1: SUMMARY OF VASCULAR PLANT SPECIES RECORDED BY SITE AT CARAVEL COPPER PROJECT MINE AREA, 2018 & 2021

Note * denotes introduced species. OPPO= Oppurtunistic collection within mine area.

T denotes threatened flora; P1-P4 denote priority flora (DPaW 2019).(see Appendix A for definitions).

SPECIES	MS01	MS02	MS03	MS04	MS05	MS06	MS07	MS08	MS09	MS10	MS11	MS12	MS13	MS14	MS15	MS16	MS17	MS18	MS19	MS20	MS21	MS22	MS23	MS24	MS25	MS26	MS27
Abutilon cryptopetalum																						X					
Abutilon ?oxycarpum																											
Acacia acuaria										X		X	X												X		
Acacia aculeiformis			X							X			X												X		
Acacia acuminata							X		X											X	X	X	X	X			
Acacia ?andrewsii																											
Acacia ?blakelyi																											
Acacia ?brumalis															X												
Acacia daviesioides																											
Acacia dielsii																											
Acacia dilatata																											
Acacia erinacea																											
Acacia ?jacksonioides																											
Acacia ?lasiocarpa																											
Acacia lasiocarpa var. *sedifolia*						X																					
Acacia microbotrya				X																							
Acacia neurophylla subsp. *neurophylla*																											
Acacia nigripilosa																											
Acacia nigripilosa subsp. *nigripilosa*																											
Acacia orbifolia																											
Acacia ?oswaldii																											
Acacia saligna ?subsp. Wheatbelt (B.R. Maslin 8602)																											
Acacia shuttleworthii			X										X														
Acacia sp.																											
Acacia ulicina										X																	
Acanthocarpus canaliculatus																											
Actinobole uliginosum																											

APPENDIX H1: SUMMARY OF VASCULAR PLANT SPECIES RECORDED BY SITE AT CARAVEL COPPER PROJECT MINE AREA, 2018 & 2021

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SPECIES	MS01	MS02	MS03	MS04	MS05	MS06	MS07	MS08	MS09	MS10	MS11	MS12	MS13	MS14	MS15	MS16	MS17	MS18	MS19	MS20	MS21	MS22	MS23	MS24	MS25	MS26	MS27
* *Aira caryophyllea*																											
Allocasuarina acutivalvis																											
Allocasuarina campestris		X	X	X		X	X	X	X			X								X					X		X
Allocasuarina huegeliana			X	X			X		X												X		X				
Allocasuarina microstachya																											
Alyogyne hakeifolia																											
Angianthus tomentosus														X		X											
Anthotroche pannosa																											
Apium annuum																											
Apium ?annuum																											
Apium ?prostratum																											
* *Arctotheca calendula*																											
Aristida contorta												X															
Aristida sp.																						X					
Arthropodium curvipes																							X				
Asteraceae sp.																											
Atriplex codonocarpa																											
Atriplex lindleyi subsp. *inflata*																											
Atriplex semibaccata																			X								
Atriplex sp.																			X								
Austrostipa elegantissima		X	X	X			X		X	X	X	X	X	X	X	X	X		X		X	X	X	X	X	X	X
Austrostipa hemipogon			X	X							X	X	X	X													
Austrostipa nitida																											
Austrostipa scabra subsp. *scabra*				X											X								X	X			
Austrostipa sp.																											
* *Avena barbata*					X	X	X	X	X						X			X				X	X	X			
* *Avena fatua*																											

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T denotes threatened flora; P1-P4 denote priority flora (DPaW 2019).(see Appendix A for definitions).

SPECIES	MS01	MS02	MS03	MS04	MS05	MS06	MS07	MS08	MS09	MS10	MS11	MS12	MS13	MS14	MS15	MS16	MS17	MS18	MS19	MS20	MS21	MS22	MS23	MS24	MS25	MS26	MS27
Banksia ?armata																											
Banksia armata var. *armata*																											
Banksia hewardiana												X	X														
Banksia prionotes																											
* *Bellardia trixago*																				X			X				
Blennospora drummondii																											
Borya sphaerocephala								X																			
Bossiaea spinescens																											
Brachyscome bellidioides																											
Brachyscome iberidifolia																											
Brachyscome perpusilla																											
Brachyscome pusilla																					X	X	X	X			
Brachyscome sp.																											
* *Brassica ×napus*										X								X									
* *Brassica* sp.																											
* *Brassica tournefortii*																											
* *Briza maxima*							X	X	X														X				
* *Bromus diandrus*																											
* *Bromus hordeaceus*																											
* *Bromus rubens*																	X										
* *Bromus* sp.																											
Brunonia australis								X	X											X	X	X	X				
Bulbine semibarbata																											
Caladenia denticulata																											
Caladenia flava																											
Calandrinia calyptrata																											
Calandrinia eremaea																											

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Calandrinia eremaea sens. lat.																											
Calandrinia granulifera																											
Calandrinia ?*granulifera*																											
Calandrinia sp.																											
?*Calandrinia* sp.	X													X				X									
Callitris arenaria																											
Callitris roei																											
Calothamnus gilesii																											
Calothamnus quadrifidus subsp. *quadrifidus*																											
Calytrix depressa																											
Calytrix leschenaultii																											
* *Carpobrotus* sp.																											
Cassytha melantha																			X								
Cassytha sp.																											
Casuarina obesa																											
* *Centaurea melitensis*																											
Centrolepis aristata																											
Centrolepis pilosa																											
Chamaescilla corymbosa																											
Chamelaucium sp. Wongan Hills (B.H. Smith 1140) (P3)																											
Cheilanthes austrotenuifolia						X	X																				
Chenopodiaceae sp.																										X	
?*Chordifex sinuosus*																											
Comesperma integerrimum																											
Comesperma scoparium																											
Comesperma sp.																											
Comesperma volubile																											

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Conostylis aculeata subsp. *bromelioides*																											
* *Cotula bipinnata*																											
* *Cotula coronopifolia*																											
Cotula cotuloides																											
Crassula colorata																		X									
Crassula colorata var. *acuminata*																											
Crassula exserta																											
Crassula sp.															X												
Cyanothamnus coerulescens subsp. *spicatus*																											
Cymbopogon obtectus																						X					
Dampiera lavandulacea																											
Dampiera ?*lavandulacea*													X												X		
Dampiera sp.																											
Daviesia hakeoides subsp. *hakeoides*											X																X
Desmocladus asper																											
Desmocladus lateriticus															X												
Desmocladus sp.																											X
Dianella revoluta						X	X								X												
Dianella revoluta var. *revoluta*																											
Didymanthus roei																											
Diplolaena velutina							X																				
Diuris picta																											
Dodonaea bursariifolia			X												X												
Dodonaea pinifolia												X															
Dodonaea viscosa subsp. *angustissima*								X																			
Drosera menziesii																											
Drosera miniata																											

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Drosera ?miniata																											
Drosera sp.																											
Drosera subhirtella																											
Ecdeiocolea monostachya																											
* *Ehrharta calycina*																											
* *Ehrharta longiflora*																											
* *Ehrharta* sp.																											
Enchylaena lanata									X	X					X	X	X		X	X				X		X	X
Enteropogon ramosus																				X							
* *Eragrostis curvula*																											
Eragrostis dielsii																											
Eragrostis sp.																					X			X			
Eremophila drummondii																X	X										
Eremophila lehmanniana																											
Eriachne ovata								X																			
Ericomyrtus serpyllifolia			X	X									X														
Erigeron sp.																											
* *Erodium botrys*																											
Erymophyllum ramosum subsp. *ramosum*																X			X								
Eucalyptus alipes (Planted)																											
Eucalyptus arachnaea subsp. *arachnaea*										X																	
Eucalyptus arachnaea subsp. *arrecta* (P3)			X																								
Eucalyptus armillata																			X								
Eucalyptus capillosa																											
Eucalyptus celastroides subsp. *virella*																										X	
Eucalyptus ebbanoensis subsp. *ebbanoensis*																											
Eucalyptus horistes																											

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Eucalyptus leucoxylon																											
Eucalyptus ?*litorea* (Planted)																											
Eucalyptus loxophleba																											
Eucalyptus loxophleba subsp. *loxophleba*	X				X		X										X							X	X		X
Eucalyptus loxophleba subsp. *supralaevis*										X	X																
Eucalyptus ?*loxophleba* subsp. *supralaevis*																											
Eucalyptus macrocarpa subsp. *elachantha* (P4)														X													
Eucalyptus orthostemon																X			X								
Eucalyptus pileata												X															
Eucalyptus rigidula																		X							X		
Eucalyptus salmonophloia															X												
Eucalyptus ?*salmonophloia*	X																	X									
Eucalyptus sp.																											
Eucalyptus virella				X	X																						
Eucalyptus wandoo	X	X	X			X				X			X														
Eucalyptus wandoo subsp. *wandoo*																											
Eucalytpus sp.																											
Eucalyptus ?*yilgarnensis*																											
Frankenia sp.									X																		
Gastrolobium callistachys																											
Gastrolobium calycinum																											
Gastrolobium trilobum			X						X													X			X		
Glischrocaryon aureum																							X				
Glischrocaryon flavescens																					X						
Gnephosis angianthoides																											
Gnephosis drummondii																											
Gnephosis tenuissima																											

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Gnephosis tridens																											
Goodenia berardiana																											
Goodenia cycnopotamica																											
Goodenia sp.																											
Grevillea ?*eriostachya*																											
Grevillea hakeoides subsp. *hakeoides*																											
Grevillea hookeriana subsp. *hookeriana*																											
Grevillea levis						X																					
Grevillea petrophiloides																											
Grevillea petrophiloides subsp. *petrophiloides*			X	X																					X		
Grevillea scabra																											
Guichenotia micrantha						X									X												
Haemodorum sp.												X															
Hakea ?*circumalata*																											
Hakea ?*commutata*																											
Hakea ?*erinacea*																											
Hakea preissii																											
Hakea scoparia subsp. *scoparia*																											
Hakea ?*scoparia*																											
Hakea sp.																											
Hakea meisneriana																											
Halgania anagalloides																											
Helichrysum ?*leucopsideum*																											
Helichrysum leucopsideum															X												
?*Hemerocallidaceae* sp.																											
Hibbertia ?*exasperata*													X												X		
Hibbertia rupicola			X	X																							

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* *Hordeum glaucum*																											
* *Hordeum leporinum*																											
Hyalochlamys globifera																											
Hyalosperma demissum																											
Hyalosperma glutinosum subsp. *glutinosum*																											
Hydrocotyle intertexta																											
Hypocalymma angustifolium																											
Hypocalymma suave																											
* *Hypochaeris glabra*																											
Isolepis cernua																											
Isolepis marginata																											
Isotropis juncea																											
Jacksonia fasciculata																											
Jacksonia floribunda																											
Jacksonia sp.				X																							
* *Juncus acutus*																											
Kennedia prostrata																											
Lasiopetalum sp.																											
Lepidobolus preissianus subsp. *preissianus*																											
Lepidosperma ?*tenue* sens. lat.																									X		
Lepidosperma asperatum																											
Lepidosperma costale sens lat.						X	X															X	X				
Lepidosperma longitudinale sens. lat.									X																		
Lepidosperma sp.						X															X						
Leptospermum erubescens				X																							
Leptospermum roei																											
Leschenaultia floribunda																											

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Levenhookia stipitata																											
Lobelia ?rhytidosperma																											
Lobelia heterophylla		X		X																							
* *Lolium perenne*																											
* *Lolium rigidum*																											
Lomandra collina																											
Lomandra sp.																											
* *Lupinus cosentinii*																						X					
* *Lysimachia arvensis*																											
Machaerina articulata																											
Machaerina juncea																											
Maireana brevifolia					X									X			X	X	X								
Maireana carnosa														X		X			X								
Maireana enchylaenoides	X																										
Maireana marginata																											
Maireana sp.																											
Malvaceae sp.																											
* *Medicago polymorpha*																											
Melaleuca ?acuminata																											
Melaleuca adnata																X			X								X
Melaleuca concreta																											
Melaleuca cuticularis																											
Melaleuca fulgens subsp. *fulgens*																											
Melaleuca hamulosa																											X
Melaleuca halmaturorum																											
Melaleuca ?halmaturorum																											
Melaleuca lateriflora																											

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	Melaleuca laxiflora																											X
	Melaleuca marginata	X															X			X								
	Melaleuca radula																											
	Melaleuca scalena																											
	Melaleuca sp.																											
	Melaleuca viminea subsp. *viminea*																											
	Melaleuca ?vinnula																											
*	*Mesembryanthemum nodiflorum*	X													X		X	X	X	X							X	
	Mirbelia ramulosa																											
	Mirbelia trichocalyx																											
*	*Monoculus monstrosus*																											
*	*Moraea flaccida*																											
	Muehlenbeckia adpressa																											
	Neurachne alopecuroidea		X	X	X			X			X		X	X		X					X		X	X		X		X
	Olearia sp.																											
	Olearia sp. eremicola (Diels & Pritzel s.n. PERTH 00449628)																											
	Opercularia vaginata													X									X	X				X
	Ophioglossum lusitanicum																											
*	*Oxalis corniculata*																											
	Panaetia lessonii																											
*	*Parapholis incurva*																											
*	*Pentameris airoides*						X		X		X		X		X	X			X									
	Pericalymma ellipticum																											
	Petrophile macrostachya												X													X		
	Petrophile ?shuttleworthiana																											
	Pimelea villifera			X																				X				
	Plantago debilis																											

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	Poaceae sp.		X														X		X		X	X	X		X		X	X
	Poaceae sp. 1						X	X																				
	Poaceae sp. 2						X		X																			
*	*Poaceae* spp.															X												
	Podolepis aristata subsp. *aristata*				X								X															
	Podotheca angustifolia																											
	Podotheca gnaphalioides								X																			X
	Podotheca sp.																											
	Pogonolepis muelleriana																											
	Pogonolepis stricta																											
	Ptilotus declinatus																								X			
	Ptilotus drummondii var. *drummondii*																											
	Ptilotus halophilus																											
	Ptilotus holosericeus														X													
	Ptilotus manglesii																								X			
	Ptilotus polystachyus			X				X	X	X		X	X								X		X	X				
	Ptilotus sp.															X												
	Ptilotus spathulatus																											
	Quinetia urvillei																											
*	*Raphanus raphanistrum*					X																						
	Rhagodia drummondii															X	X	X										
	Rhagodia preissii subsp. *preissii*																X	X										
	Rhagodia sp. Watheroo (R.J. Cranfield & P.J. Spencer 8183)																											X
	Rhodanthe manglesii																											
*	*Romulea rosea*																											
	Rytidosperma caespitosum										X		X		X													
	Salsola australis																											

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	Santalum acuminatum		X																X									
	Santalum murrayanum																											X
	Santalum sp.																											
	Santalum ?spicatum																											
	Scaevola spinescens																											
	Scaevola ?spinescens																											
	Schoenus clandestinus																											
	Scholtzia drummondii																											
	Sclerolaena diacantha																X			X								
	Sclerolaena eurotioides																											
	Senecio lacustrinus																											
	Senecio pinnatifolius var. *pinnatifolius*																											
	Seringia velutina																											
	Siemssenia capillaris																											
*	*Sonchus oleraceus*																	X										
	Spartochloa scirpoidea																											
	Spergularia marina																											
*	*Spergularia rubra*																											
	Stackhousia sp. Hairy fruited (E.N.S. Jackson 1387)																											
	Stenanthemum pomaderroides												X	X												X		
	Stenopetalum sphaerocarpum																											
	Stylidium leptophyllum																											
	Stylidium neglectum																											
	Stylidium sp.																											
	Stylobasium australe																								X			
	Stypandra glauca																					X		X				
	Styphelia pallida																											

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Styphelia serratifolia																											
Tecticornia indica subsp. *bidens*																											
Tecticornia lepidosperma																											
Tecticornia pergranulata subsp. *pergranulata*																											
Tecticornia sp. 1																											
Tecticornia sp. 3																											
Templetonia sulcata														X													
Thryptomene cuspidata																											
Thryptomene mucronulata																											
Thryptomene racemulosa																											
Thysanotus dichotomus				X														X									X
Thysanotus patersonii																											
Thysanotus sp.																											
Trachymene cyanopetala																					X						
Trachymene ornata																											
Trachymene pilosa		X																					X				
Tricoryne tenella																							X				
?*Tricoryne* sp.																							X	X			X
* *Trifolium arvense*																											
* *Trifolium glomeratum*																											
* *Trifolium subterraneum*																											
Triglochin calcitrapa																											
Triglochin isingiana																											
Triglochin longicarpa																											
Triglochin minutissima																											
Triglochin mucronata																											
Triglochin sp.																											

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Triodia danthonioides																											
Trymalium ?daphnifolium									X		X																
?*Trymalium* sp.													X														
* *Ursinia anthemoides*		X				X	X	X	X												X	X	X				
Utricularia violacea																											
* *Vulpia muralis*																											
Wahlenbergia gracilenta																											
Waitzia acuminata									X																		
Waitzia acuminata var. *acuminata*		X	X	X		X				X	X	X	X	X	X					X	X	X	X	X	X		X
Waitzia nitida			X	X																							
Wilsonia humilis																											
Xanthosia sp.				X																							
* *Zaluzianskya divaricata*																											

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SPECIES	MS28	MS29	MS30	MS34	MS35	MS36	MS37	MS38	MS39	MS40	MS41	MS42	MS43	MS44	MS45	MS46	MS47	MS48	MS49	MS50	MS51	MS52	MS53	MS54	MS55	MS56
Abutilon cryptopetalum																										
Abutilon ?oxycarpum																										
Acacia acuaria																										
Acacia aculeiformis																										
Acacia acuminata																										
Acacia ?andrewsii																										
Acacia ?blakelyi									X																	
Acacia ?brumalis				X																						
Acacia daviesioides																										
Acacia dielsii																										
Acacia dilatata																	X									
Acacia erinacea					X																					
Acacia ?jacksonioides																										
Acacia ?lasiocarpa										X																
Acacia lasiocarpa var. *sedifolia*																										
Acacia microbotrya																										
Acacia neurophylla subsp. *neurophylla*																							X			
Acacia nigripilosa																										
Acacia nigripilosa subsp. *nigripilosa*																										
Acacia orbifolia																										
Acacia ?oswaldii																										
Acacia saligna ?subsp. *Wheatbelt* (B.R. Maslin 8602)																										
Acacia shuttleworthii																										
Acacia sp.	X			X																						
Acacia ulicina																										
Acanthocarpus canaliculatus	X	X																			X		X	X		
Actinobole uliginosum										X							X					X		X	X	X

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* *Aira caryophyllea*				X																				X		
Allocasuarina acutivalvis																					X					
Allocasuarina campestris				X																	X					
Allocasuarina huegeliana																										
Allocasuarina microstachya																					X					
Alyogyne hakeifolia						X																				
Angianthus tomentosus					X																					
Anthotroche pannosa																										
Apium annuum																				X						
Apium ?annuum																	X									
Apium ?prostratum																				X			X			
* *Arctotheca calendula*							X		X	X		X		X			X		X	X	X	X	X	X	X	
Aristida contorta																	X						X		X	
Aristida sp.																										
Arthropodium curvipes																										
Asteraceae sp.															X											
Atriplex codonocarpa																		X	X	X						
Atriplex lindleyi subsp. *inflata*																										
Atriplex semibaccata					X																					
Atriplex sp.														X				X	X	X		X				
Austrostipa elegantissima	X	X			X												X									
Austrostipa hemipogon																										
Austrostipa nitida																										
Austrostipa scabra subsp. *scabra*																										
Austrostipa sp.																		X			X		X	X		X
* *Avena barbata*	X																									
* *Avena fatua*				X		X						X					X				X		X			

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Banksia ?armata																										
Banksia armata var. *armata*																					X					
Banksia hewardiana																										
Banksia prionotes																										
* *Bellardia trixago*																										
Blennospora drummondii																					X					
Borya sphaerocephala				X																						
Bossiaea spinescens																										
Brachyscome bellidioides																			X	X	X	X	X	X	X	
Brachyscome iberidifolia																				X						
Brachyscome perpusilla																										
Brachyscome pusilla																										
Brachyscome sp.																				X						
* *Brassica ×napus*			X																							
* *Brassica* sp.												X														
* *Brassica tournefortii*					X		X			X				X							X					
* *Briza maxima*																					X					
* *Bromus diandrus*																										
* *Bromus hordeaceus*																										
* *Bromus rubens*			X											X										X		
* *Bromus* sp.												X														
Brunonia australis																										
Bulbine semibarbata																				X						
Caladenia denticulata																										
Caladenia flava																					X					
Calandrinia calyptrata														X												
Calandrinia eremaea																					X	X	X	X		

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	Calandrinia eremaea sens. lat.										X							X									
	Calandrinia granulifera									X													X	X			X
	Calandrinia ?*granulifera*																	X			X		X	X			X
	Calandrinia sp.																										
	?*Calandrinia* sp.																										
	Callitris arenaria																						X				
	Callitris roei																										
	Calothamnus gilesii																										
	Calothamnus quadrifidus subsp. *quadrifidus*												X														
	Calytrix depressa				X																						
	Calytrix leschenaultii																										
*	*Carpobrotus* sp.																										
	Cassytha melantha																										
	Cassytha sp.																	X									
	Casuarina obesa								X																		
*	*Centaurea melitensis*																										
	Centrolepis aristata											X		X					X	X							
	Centrolepis pilosa																					X			X		
	Chamaescilla corymbosa																										
	Chamelaucium sp. Wongan Hills (B.H. Smith 1140) (P3)		X																								
	Cheilanthes austrotenuifolia																										
	Chenopodiaceae sp.																										
	?*Chordifex sinuosus*		X																								
	Comesperma integerrimum																										
	Comesperma scoparium																										
	Comesperma sp.																								X		
	Comesperma volubile																										

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	Conostylis aculeata subsp. *bromelioides*		X																								
*	*Cotula bipinnata*							X		X		X	X	X	X		X		X	X							X
*	*Cotula coronopifolia*											X															
	Cotula cotuloides																			X	X						
	Crassula colorata																										
	Crassula colorata var. *acuminata*							X							X												
	Crassula exserta																										
	Crassula sp.									X	X		X				X	X		X	X	X	X		X	X	
	Cyanothamnus coerulescens subsp. *spicatus*																										
	Cymbopogon obtectus																										
	Dampiera lavandulacea																					X		X			
	Dampiera ?*lavandulacea*																										
	Dampiera sp.																										
	Daviesia hakeoides subsp. *hakeoides*																										
	Desmocladus asper									X														X			
	Desmocladus lateriticus																										
	Desmocladus sp.																										
	Dianella revoluta						X			X			X					X			X	X		X			
	Dianella revoluta var. *revoluta*																										
	Didymanthus roei											X					X		X	X	X		X			X	X
	Diplolaena velutina																										
	Diuris picta																										
	Dodonaea bursariifolia																										
	Dodonaea pinifolia																										
	Dodonaea viscosa subsp. *angustissima*																										
	Drosera menziesii																	X									
	Drosera miniata														X									X	X		

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	Drosera ?miniata								X																		
	Drosera sp.																										
	Drosera subhirtella																										
	Ecdeiocolea monostachya																					X					
*	*Ehrharta calycina*									X	X														X		
*	*Ehrharta longiflora*												X		X												
*	*Ehrharta* sp.																										
	Enchylaena lanata	X					X				X		X		X						X						X
	Enteropogon ramosus																										
*	*Eragrostis curvula*																										
	Eragrostis dielsii																			X	X		X	X		X	X
	Eragrostis sp.																										
	Eremophila drummondii						X																				
	Eremophila lehmanniana																										
	Eriachne ovata																										
	Ericomyrtus serpyllifolia																										
	Erigeron sp.																										
*	*Erodium botrys*										X											X			X		
	Erymophyllum ramosum subsp. *ramosum*																										
	Eucalyptus alipes (Planted)							X																			
	Eucalyptus arachnaea subsp. *arachnaea*																										
	Eucalyptus arachnaea subsp. *arrecta* (P3)																										
	Eucalyptus armillata			X		X																					
	Eucalyptus capillosa														X												
	Eucalyptus celastroides subsp. *virella*																										
	Eucalyptus ebbanoensis subsp. *ebbanoensis*																										
	Eucalyptus horistes																					X					

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Eucalyptus leucoxylon																										
Eucalyptus ?*litorea* (Planted)												X														
Eucalyptus loxophleba				X	X																					
Eucalyptus loxophleba subsp. *loxophleba*																				X						
Eucalyptus loxophleba subsp. *supralaevis*																										
Eucalyptus ?*loxophleba* subsp. *supralaevis*																										
Eucalyptus macrocarpa subsp. *elachantha* (P4)																										
Eucalyptus orthostemon							X											X								
Eucalyptus pileata																										
Eucalyptus rigidula					X	X																				
Eucalyptus salmonophloia						X																				
Eucalyptus ?*salmonophloia*																										
Eucalyptus sp.										X		X														
Eucalyptus virella			X																							
Eucalyptus wandoo																										
Eucalyptus wandoo subsp. *wandoo*																										
Eucalytpus sp.												X		X												
Eucalyptus ?*yilgarnensis*																										
Frankenia sp.																									X	
Gastrolobium callistachys																										
Gastrolobium calycinum																										
Gastrolobium trilobum																										
Glischrocaryon aureum																										
Glischrocaryon flavescens																										
Gnephosis angianthoides																				X						
Gnephosis drummondii																				X						
Gnephosis tenuissima																										

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Gnephosis tridens																										
Goodenia berardiana																					X					X
Goodenia cycnopotamica																					X					
Goodenia sp.												X														
Grevillea ?eriostachya																										
Grevillea hakeoides subsp. *hakeoides*		X																								
Grevillea hookeriana subsp. *hookeriana*									X								X									
Grevillea levis		X																			X		X	X		
Grevillea petrophiloides																										
Grevillea petrophiloides subsp. *petrophiloides*																										
Grevillea scabra																										
Guichenotia micrantha																										
Haemodorum sp.																										
Hakea ?circumalata																		X				X				
Hakea ?commutata																										
Hakea ?erinacea																										
Hakea preissii																										
Hakea scoparia subsp. *scoparia*																										
Hakea ?scoparia																										
Hakea sp.		X																								
Hakea meisneriana																										
Halgania anagalloides																										
Helichrysum ?leucopsideum																										
Helichrysum leucopsideum																										
?*Hemerocallidaceae* sp.																										
Hibbertia ?exasperata																										
Hibbertia rupicola																										

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* *Hordeum glaucum*							X																			
* *Hordeum leporinum*																				X						
Hyalochlamys globifera																				X						
Hyalosperma demissum																	X				X					
Hyalosperma glutinosum subsp. *glutinosum*																					X			X		
Hydrocotyle intertexta																					X					
Hypocalymma angustifolium				X																						
Hypocalymma suave																										
* *Hypochaeris glabra*									X	X		X					X				X		X	X	X	
Isolepis cernua												X														
Isolepis marginata																				X		X				
Isotropis juncea																							X			
Jacksonia fasciculata									X																	
Jacksonia floribunda									X																	
Jacksonia sp.																										
* *Juncus acutus*															X											
Kennedia prostrata																										
Lasiopetalum sp.																										
Lepidobolus preissianus subsp. *preissianus*																					X					
Lepidosperma ?*tenue* sens. lat.																										
Lepidosperma asperatum									X																	
Lepidosperma costale sens lat.																										
Lepidosperma longitudinale sens. lat.																										
Lepidosperma sp.																										
Leptospermum erubescens																										
Leptospermum roei																										
Leschenaultia floribunda																					X					

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Levenhookia stipitata																				X						
Lobelia ?rhytidosperma																										
Lobelia heterophylla																										
* *Lolium perenne*					X																					
* *Lolium rigidum*							X					X		X		X		X	X	X			X	X	X	
Lomandra collina		X																								
Lomandra sp.																							X	X		
* *Lupinus cosentinii*																										
* *Lysimachia arvensis*										X										X						
Machaerina articulata																										
Machaerina juncea																										
Maireana brevifolia			X	X		X																				
Maireana carnosa																										
Maireana enchylaenoides																										
Maireana marginata																										
Maireana sp.										X				X												
Malvaceae sp.																										
* *Medicago polymorpha*														X												
Melaleuca ?acuminata	X																									
Melaleuca adnata	X																									
Melaleuca concreta				X																X						
Melaleuca cuticularis																										
Melaleuca fulgens subsp. *fulgens*																										
Melaleuca hamulosa		X																		X				X		
Melaleuca halmaturorum																								X		
Melaleuca ?halmaturorum																						X				
Melaleuca lateriflora																				X			X	X		

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	Melaleuca laxiflora		X																								
	Melaleuca marginata					X	X																				
	Melaleuca radula																										
	Melaleuca scalena															X									X		
	Melaleuca sp.	X																					X				
	Melaleuca viminea subsp. *viminea*															X											
	Melaleuca ?vinnula		X																								
*	*Mesembryanthemum nodiflorum*					X		X				X		X	X	X	X		X	X	X		X		X	X	X
	Mirbelia ramulosa																							X			
	Mirbelia trichocalyx																										
*	*Monoculus monstrosus*														X			X			X			X	X	X	
*	*Moraea flaccida*																										
	Muehlenbeckia adpressa									X																	
	Neurachne alopecuroidea																					X	X				
	Olearia sp.																										
	Olearia sp. eremicola (Diels & Pritzel s.n. PERTH 00449628)																										
	Opercularia vaginata																					X		X			
	Ophioglossum lusitanicum																								X		
*	*Oxalis corniculata*										X																
	Panaetia lessonii																					X					
*	*Parapholis incurva*																										
*	*Pentameris airoides*														X												
	Pericalymma ellipticum																	X									
	Petrophile macrostachya																										
	Petrophile ?shuttleworthiana																										
	Pimelea villifera																										
	Plantago debilis																										

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	Poaceae sp.								X			X															
	Poaceae sp. 1													X													
	Poaceae sp. 2													X													
*	*Poaceae* spp.																										
	Podolepis aristata subsp. *aristata*																					X		X			
	Podotheca angustifolia																	X				X		X			
	Podotheca gnaphalioides	X	X								X														X		
	Podotheca sp.																										
	Pogonolepis muelleriana														X						X						
	Pogonolepis stricta	X																							X	X	X
	Ptilotus declinatus	X																									
	Ptilotus drummondii var. *drummondii*																										
	Ptilotus halophilus																										
	Ptilotus holosericeus																										
	Ptilotus manglesii																										
	Ptilotus polystachyus										X																
	Ptilotus sp.																										
	Ptilotus spathulatus																										
	Quinetia urvillei																			X	X		X		X		
*	*Raphanus raphanistrum*																										
	Rhagodia drummondii																										
	Rhagodia preissii subsp. *preissii*					X	X	X	X	X	X							X	X	X	X	X	X	X	X		X
	Rhagodia sp. Watheroo (R.J. Cranfield & P.J. Spencer 8183)	X	X																								
	Rhodanthe manglesii																					X					
*	*Romulea rosea*												X						X								
	Rytidosperma caespitosum				X	X	X																				
	Salsola australis																										

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	Santalum acuminatum																										
	Santalum murrayanum	X	X																								
	Santalum sp.																										
	Santalum ?spicatum																					X	X				
	Scaevola spinescens																										
	Scaevola ?spinescens																										
	Schoenus clandestinus																										
	Scholtzia drummondii								X																		
	Sclerolaena diacantha																										
	Sclerolaena eurotioides																			X							
	Senecio lacustrinus							X											X	X							
	Senecio pinnatifolius var. *pinnatifolius*																				X		X	X	X	X	X
	Seringia velutina																										
	Siemssenia capillaris		X		X										X		X	X			X		X	X	X		
*	*Sonchus oleraceus*			X											X						X			X	X	X	
	Spartochloa scirpoidea				X																						
	Spergularia marina																										
*	*Spergularia rubra*											X	X														
	Stackhousia sp. Hairy fruited (E.N.S. Jackson 1387)																										
	Stenanthemum pomaderroides																										
	Stenopetalum sphaerocarpum																						X				
	Stylidium leptophyllum																										
	Stylidium neglectum				X																						
	Stylidium sp.																				X					X	
	Stylobasium australe																										
	Stypandra glauca																										
	Styphelia pallida																										

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Styphelia serratifolia																										
Tecticornia indica subsp. *bidens*																		X		X					X	
Tecticornia lepidosperma																		X	X	X		X		X	X	X
Tecticornia pergranulata subsp. *pergranulata*											X		X													X
Tecticornia sp. 1											X															
Tecticornia sp. 3											X		X			X										
Templetonia sulcata																										
Thryptomene cuspidata				X																						
Thryptomene mucronulata																				X						
Thryptomene racemulosa																										
Thysanotus dichotomus		X																								
Thysanotus patersonii																					X					
Thysanotus sp.																							X			
Trachymene cyanopetala																					X	X				
Trachymene ornata																					X					
Trachymene pilosa																				X						
Tricoryne tenella																										
?*Tricoryne* sp.	X																									
* *Trifolium arvense*																										
* *Trifolium glomeratum*																										
* *Trifolium subterraneum*												X														
Triglochin calcitrapa																			X	X		X	X	X	X	
Triglochin isingiana										X																
Triglochin longicarpa														X		X										
Triglochin minutissima															X	X										
Triglochin mucronata											X		X					X	X	X				X		X
Triglochin sp.											X															

APPENDIX H1: SUMMARY OF VASCULAR PLANT SPECIES RECORDED BY SITE AT CARAVEL COPPER PROJECT MINE AREA, 2018 & 2021

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	SPECIES	MS28	MS29	MS30	MS34	MS35	MS36	MS37	MS38	MS39	MS40	MS41	MS42	MS43	MS44	MS45	MS46	MS47	MS48	MS49	MS50	MS51	MS52	MS53	MS54	MS55	MS56
	Triodia danthonioides																										
	Trymalium ?daphnifolium																										
	?*Trymalium* sp.																										
*	*Ursinia anthemoides*										X							X			X	X	X	X	X	X	
	Utricularia violacea																				X						
*	*Vulpia muralis*									X	X		X						X	X	X	X	X	X	X	X	
	Wahlenbergia gracilenta																										
	Waitzia acuminata				X																						
	Waitzia acuminata var. *acuminata*				X																	X					
	Waitzia nitida																										
	Wilsonia humilis																		X								
	Xanthosia sp.																										
*	*Zaluzianskya divaricata*										X				X										X		

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SPECIES	MS57	MS58	MS59	MS60	MS61	MS62	MS63	MS64	MS65	MS66	MS67	MS68	MS69	MS70	MS71	MS84	MS85	MS86	MS87	MS88	MS89	MS90	MS91	OPPO
Abutilon cryptopetalum																								
Abutilon ?oxycarpum																								X
Acacia acuaria																		X						
Acacia aculeiformis																								
Acacia acuminata																		X	X		X	X	X	
Acacia ?andrewsii																								X
Acacia ?blakelyi						X																		
Acacia ?brumalis																								
Acacia daviesioides		X																						
Acacia dielsii		X																						
Acacia dilatata																								
Acacia erinacea																		X						
Acacia ?jacksonioides																		X	X		X			
Acacia ?lasiocarpa																								
Acacia lasiocarpa var. *sedifolia*																								
Acacia microbotrya																								
Acacia neurophylla subsp. *neurophylla*		X																						
Acacia nigripilosa													X											
Acacia nigripilosa subsp. *nigripilosa*																				X			X	
Acacia orbifolia																				X				
Acacia ?oswaldii																	X							
Acacia saligna ?subsp. *Wheatbelt* (B.R. Maslin 8602)																								X
Acacia shuttleworthii																								X
Acacia sp.																					X			
Acacia ulicina																								
Acanthocarpus canaliculatus												X												X
Actinobole uliginosum		X																		X				

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* *Aira caryophyllea*																								
Allocasuarina acutivalvis																								
Allocasuarina campestris																X			X					X
Allocasuarina huegeliana																								
Allocasuarina microstachya																								
Alyogyne hakeifolia																								
Angianthus tomentosus																								
Anthotroche pannosa																								X
Apium annuum	X																							
Apium ?annuum																								
Apium ?prostratum																								
* *Arctotheca calendula*										X	X	X	X		X	X	X	X		X	X	X		
Aristida contorta																								
Aristida sp.																								
Arthropodium curvipes																								X
Asteraceae sp.																								
Atriplex codonocarpa																								
Atriplex lindleyi subsp. *inflata*														X	X									
Atriplex semibaccata																								X
Atriplex sp.																								X
Austrostipa elegantissima											X				X									
Austrostipa hemipogon																X	X		X	X	X	X	X	
Austrostipa nitida												X												
Austrostipa scabra subsp. *scabra*																								
Austrostipa sp.		X																						
* *Avena barbata*																								
* *Avena fatua*										X	X	X											X	

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	Banksia ?armata																								X
	Banksia armata var. *armata*																	X							
	Banksia hewardiana																								
	Banksia prionotes								X																
*	*Bellardia trixago*																								
	Blennospora drummondii		X																						
	Borya sphaerocephala		X																						
	Bossiaea spinescens																							X	
	Brachyscome bellidioides																								
	Brachyscome iberidifolia												X												
	Brachyscome perpusilla		X																						
	Brachyscome pusilla																								
	Brachyscome sp.																								
*	*Brassica ×napus*																								
*	*Brassica* sp.																								
*	*Brassica tournefortii*												X												
*	*Briza maxima*																								
*	*Bromus diandrus*									X															
*	*Bromus hordeaceus*									X															
*	*Bromus rubens*																								
*	*Bromus* sp.																								
	Brunonia australis																								
	Bulbine semibarbata																								
	Caladenia denticulata		X																						
	Caladenia flava																								
	Calandrinia calyptrata							X				X	X	X		X									
	Calandrinia eremaea																								

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	Calandrinia eremaea sens. lat.																								
	Calandrinia granulifera																								
	Calandrinia ?*granulifera*																								
	Calandrinia sp.																		X	X	X				
	?*Calandrinia* sp.																								
	Callitris arenaria																								
	Callitris roei																	X							
	Calothamnus gilesii																								X
	Calothamnus quadrifidus subsp. *quadrifidus*																								
	Calytrix depressa																								
	Calytrix leschenaultii		X																						
*	*Carpobrotus* sp.							X					X	X											
	Cassytha melantha																								
	Cassytha sp.																								
	Casuarina obesa		X	X						X	X				X								X		X
*	*Centaurea melitensis*																				X				
	Centrolepis aristata																								
	Centrolepis pilosa																								
	Chamaescilla corymbosa		X																						
	Chamelaucium sp. Wongan Hills (B.H. Smith 1140) (P3)																								X
	Cheilanthes austrotenuifolia																								
	Chenopodiaceae sp.							X																	
	?*Chordifex sinuosus*																								
	Comesperma integerrimum						X																		
	Comesperma scoparium																	X						X	
	Comesperma sp.																								
	Comesperma volubile								X			X	X												

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	Conostylis aculeata subsp. *bromelioides*																								
*	*Cotula bipinnata*	X																		X					
*	*Cotula coronopifolia*	X												X	X	X									
	Cotula cotuloides																								
	Crassula colorata																								
	Crassula colorata var. *acuminata*																								
	Crassula exserta							X			X	X	X												
	Crassula sp.															X									
	Cyanothamnus coerulescens subsp. *spicatus*																							X	X
	Cymbopogon obtectus																								X
	Dampiera lavandulacea		X																X					X	
	Dampiera ?lavandulacea																								
	Dampiera sp.																								X
	Daviesia hakeoides subsp. *hakeoides*																							X	
	Desmocladus asper																								
	Desmocladus lateriticus																								
	Desmocladus sp.																								
	Dianella revoluta		X		X		X		X				X					X						X	
	Dianella revoluta var. *revoluta*																								X
	Didymanthus roei	X													X	X									
	Diplolaena velutina																								
	Diuris picta		X																						
	Dodonaea bursariifolia																								X
	Dodonaea pinifolia		X																						
	Dodonaea viscosa subsp. *angustissima*																								
	Drosera menziesii																								
	Drosera miniata		X																						

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	Drosera ?*miniata*																								
	Drosera sp.											X													
	Drosera subhirtella		X																						
	Ecdeiocolea monostachya		X																						X
*	*Ehrharta calycina*								X		X						X		X						
*	*Ehrharta longiflora*											X													
*	*Ehrharta* sp.				X																				
	Enchylaena lanata							X						X		X	X		X	X	X	X	X		
	Enteropogon ramosus																								
*	*Eragrostis curvula*																X								
	Eragrostis dielsii	X										X	X			X									
	Eragrostis sp.																								
	Eremophila drummondii																								
	Eremophila lehmanniana																				X				
	Eriachne ovata																								X
	Ericomyrtus serpyllifolia		X																					X	
	Erigeron sp.				X																				
*	*Erodium botrys*											X													
	Erymophyllum ramosum subsp. *ramosum*																								
	Eucalyptus alipes (Planted)																								
	Eucalyptus arachnaea subsp. *arachnaea*																								
	Eucalyptus arachnaea subsp. *arrecta* (P3)																								X
	Eucalyptus armillata																								X
	Eucalyptus capillosa																								
	Eucalyptus celastroides subsp. *virella*																								
	Eucalyptus ebbanoensis subsp. *ebbanoensis*																	X							
	Eucalyptus horistes												X												

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Eucalyptus leucoxylon																						X		
Eucalyptus ?litorea (Planted)																								
Eucalyptus loxophleba																X		X	X		X		X	X
Eucalyptus loxophleba subsp. *loxophleba*																				X				
Eucalyptus loxophleba subsp. *supralaevis*																								X
Eucalyptus ?loxophleba subsp. *supralaevis*																								X
Eucalyptus macrocarpa subsp. *elachantha* (P4)																								X
Eucalyptus orthostemon																								
Eucalyptus pileata																								
Eucalyptus rigidula																								
Eucalyptus salmonophloia																		X	X		X	X		
Eucalyptus ?salmonophloia																								X
Eucalyptus sp.				X						X														
Eucalyptus virella																								
Eucalyptus wandoo																		X	X	X		X		X
Eucalyptus wandoo subsp. *wandoo*																								
Eucalytpus sp.																								
Eucalyptus ?yilgarnensis																			X					
Frankenia sp.																								
Gastrolobium callistachys																								
Gastrolobium calycinum																							X	
Gastrolobium trilobum																								X
Glischrocaryon aureum																	X							
Glischrocaryon flavescens																								
Gnephosis angianthoides																								
Gnephosis drummondii																								
Gnephosis tenuissima										X														

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Gnephosis tridens															X									
Goodenia berardiana																								
Goodenia cycnopotamica		X																						
Goodenia sp.																								
Grevillea ?*eriostachya*																							X	
Grevillea hakeoides subsp. *hakeoides*																								
Grevillea hookeriana subsp. *hookeriana*										X														
Grevillea levis		X								X														
Grevillea petrophiloides																X	X		X					
Grevillea petrophiloides subsp. *petrophiloides*																								
Grevillea scabra																							X	
Guichenotia micrantha																								
Haemodorum sp.																								
Hakea ?*circumalata*																								
Hakea ?*commutata*																						X		
Hakea ?*erinacea*																			X					
Hakea preissii									X			X			X									
Hakea scoparia subsp. *scoparia*																X								X
Hakea ?*scoparia*																								X
Hakea sp.																	X							
Hakea meisneriana																							X	
Halgania anagalloides																								X
Helichrysum ?*leucopsideum*										X														
Helichrysum leucopsideum																								X
?*Hemerocallidaceae* sp.																								X
Hibbertia ?*exasperata*																								
Hibbertia rupicola																								

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* *Hordeum glaucum*																								
* *Hordeum leporinum*									X	X			X			X								
Hyalochlamys globifera																								
Hyalosperma demissum		X																						
Hyalosperma glutinosum subsp. *glutinosum*																								
Hydrocotyle intertexta																								
Hypocalymma angustifolium																								
Hypocalymma suave																	X							
* *Hypochaeris glabra*							X	X		X	X	X											X	
Isolepis cernua									X															
Isolepis marginata	X																							
Isotropis juncea																								
Jacksonia fasciculata						X																		
Jacksonia floribunda																								
Jacksonia sp.																								
* *Juncus acutus*	X		X			X			X	X														
Kennedia prostrata																								X
Lasiopetalum sp.																								X
Lepidobolus preissianus subsp. *preissianus*																								
Lepidosperma ?tenue sens. lat.																								
Lepidosperma asperatum		X			X																			
Lepidosperma costale sens lat.																								
Lepidosperma longitudinale sens. lat.																								
Lepidosperma sp.			X		X																			X
Leptospermum erubescens																								
Leptospermum roei																	X						X	
Leschenaultia floribunda																								

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Levenhookia stipitata																								
Lobelia ?rhytidosperma										X														
Lobelia heterophylla																								
* *Lolium perenne*																								
* *Lolium rigidum*									X				X	X		X		X		X	X	X		
Lomandra collina																								
Lomandra sp.																								
* *Lupinus cosentinii*																								
* *Lysimachia arvensis*																								
Machaerina articulata			X		X																			
Machaerina juncea			X																					
Maireana brevifolia																								
Maireana carnosa																								
Maireana enchylaenoides																								
Maireana marginata																								X
Maireana sp.										X								X		X		X		
Malvaceae sp.																							X	
* *Medicago polymorpha*																		X						
Melaleuca ?acuminata																								
Melaleuca adnata											X		X											
Melaleuca concreta																								
Melaleuca cuticularis	X																							
Melaleuca fulgens subsp. *fulgens*																								X
Melaleuca hamulosa							X																	
Melaleuca halmaturorum																								
Melaleuca ?halmaturorum																								
Melaleuca lateriflora											X		X											

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	Melaleuca laxiflora																								
	Melaleuca marginata																X								
	Melaleuca radula																								X
	Melaleuca scalena							X					X												
	Melaleuca sp.																							X	
	Melaleuca viminea subsp. *viminea*			X	X		X				X														
	Melaleuca ?vinnula																								
*	*Mesembryanthemum nodiflorum*													X	X	X									
	Mirbelia ramulosa		X																						
	Mirbelia trichocalyx																							X	
*	*Monoculus monstrosus*											X	X	X											
*	*Moraea flaccida*																				X				
	Muehlenbeckia adpressa				X		X											X							
	Neurachne alopecuroidea		X																				X		
	Olearia sp.																								X
	Olearia sp. eremicola (Diels & Pritzel s.n. PERTH 00449628)		X																						
	Opercularia vaginata		X																					X	
	Ophioglossum lusitanicum																								
*	*Oxalis corniculata*																								
	Panaetia lessonii		X																					X	
*	*Parapholis incurva*														X	X									
*	*Pentameris airoides*											X	X												
	Pericalymma ellipticum																								
	Petrophile macrostachya																								
	Petrophile ?shuttleworthiana																	X							
	Pimelea villifera																								
	Plantago debilis											X													

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	Poaceae sp.	X																							
	Poaceae sp. 1																								
	Poaceae sp. 2																								
*	*Poaceae* spp.																								
	Podolepis aristata subsp. *aristata*																								
	Podotheca angustifolia							X				X													
	Podotheca gnaphalioides																								
	Podotheca sp.												X												
	Pogonolepis muelleriana																								
	Pogonolepis stricta											X			X	X									X
	Ptilotus declinatus																								
	Ptilotus drummondii var. *drummondii*																								X
	Ptilotus halophilus																			X					
	Ptilotus holosericeus																								
	Ptilotus manglesii																								
	Ptilotus polystachyus												X				X	X						X	
	Ptilotus sp.																								
	Ptilotus spathulatus												X												
	Quinetia urvillei																								
*	*Raphanus raphanistrum*																X		X						
	Rhagodia drummondii							X	X	X	X	X	X	X	X	X									
	Rhagodia preissii subsp. *preissii*	X	X		X												X			X			X		
	Rhagodia sp. Watheroo (R.J. Cranfield & P.J. Spencer 8183)																								
	Rhodanthe manglesii																								
*	*Romulea rosea*									X	X													X	
	Rytidosperma caespitosum																								
	Salsola australis																			X					

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	Santalum acuminatum																X	X							X
	Santalum murrayanum																								
	Santalum sp.												X												
	Santalum ?spicatum																								
	Scaevola spinescens																								X
	Scaevola ?spinescens																				X				
	Schoenus clandestinus		X																						
	Scholtzia drummondii								X																
	Sclerolaena diacantha																								
	Sclerolaena eurotioides															X									
	Senecio lacustrinus													X											
	Senecio pinnatifolius var. *pinnatifolius*																								
	Seringia velutina																X			X				X	
	Siemssenia capillaris											X	X			X									
*	*Sonchus oleraceus*								X	X	X	X		X	X										
	Spartochloa scirpoidea																								
	Spergularia marina	X																							
*	*Spergularia rubra*													X											
	Stackhousia sp. Hairy fruited (E.N.S. Jackson 1387)																								X
	Stenanthemum pomaderroides																	X							
	Stenopetalum sphaerocarpum																								
	Stylidium leptophyllum																								X
	Stylidium neglectum																								
	Stylidium sp.																								
	Stylobasium australe																								X
	Stypandra glauca																								
	Styphelia pallida																							X	

APPENDIX H1: SUMMARY OF VASCULAR PLANT SPECIES RECORDED BY SITE AT CARAVEL COPPER PROJECT MINE AREA, 2018 & 2021

Note * denotes introduced species. OPPO= Oppurtunistic collection within mine area.

T denotes threatened flora; P1-P4 denote priority flora (DPaW 2019).(see Appendix A for definitions).

	SPECIES	MS57	MS58	MS59	MS60	MS61	MS62	MS63	MS64	MS65	MS66	MS67	MS68	MS69	MS70	MS71	MS84	MS85	MS86	MS87	MS88	MS89	MS90	MS91	OPPO
	Styphelia serratifolia		X																						
	Tecticornia indica subsp. *bidens*													X	X	X									
	Tecticornia lepidosperma	X												X	X	X									
	Tecticornia pergranulata subsp. *pergranulata*	X																							
	Tecticornia sp. 1																								
	Tecticornia sp. 3																								
	Templetonia sulcata																								
	Thryptomene cuspidata																								
	Thryptomene mucronulata						X	X																	
	Thryptomene racemulosa																							X	
	Thysanotus dichotomus																								
	Thysanotus patersonii							X					X					X							
	Thysanotus sp.																								
	Trachymene cyanopetala		X																						X
	Trachymene ornata																								
	Trachymene pilosa																								
	Tricoryne tenella																								
	?*Tricoryne* sp.																								
*	*Trifolium arvense*											X													
*	*Trifolium glomeratum*											X		X											
*	*Trifolium subterraneum*																								
	Triglochin calcitrapa	X																							
	Triglochin isingiana																								
	Triglochin longicarpa																								
	Triglochin minutissima																								
	Triglochin mucronata	X																							
	Triglochin sp.											X	X												

APPENDIX H1: SUMMARY OF VASCULAR PLANT SPECIES RECORDED BY SITE AT CARAVEL COPPER PROJECT MINE AREA, 2018 & 2021

Note * denotes introduced species. OPPO= Oppurtunistic collection within mine area.

T denotes threatened flora; P1-P4 denote priority flora (DPaW 2019).(see Appendix A for definitions).

	SPECIES	MS57	MS58	MS59	MS60	MS61	MS62	MS63	MS64	MS65	MS66	MS67	MS68	MS69	MS70	MS71	MS84	MS85	MS86	MS87	MS88	MS89	MS90	MS91	OPPO
	Triodia danthonioides												X													
	Trymalium ?daphnifolium																									
	?*Trymalium* sp.																									
*	*Ursinia anthemoides*								X	X	X		X													
	Utricularia violacea																									
*	*Vulpia muralis*											X	X	X		X					X		X			
	Wahlenbergia gracilenta										X															
	Waitzia acuminata																									
	Waitzia acuminata var. *acuminata*																									
	Waitzia nitida																									
	Wilsonia humilis																									
	Xanthosia sp.																									
*	*Zaluzianskya divaricata*		X							X																

APPENDIX H2: SUMMARY OF VASCULAR PLANT SPECIES RECORDED BY SITE AT KOODJEE NATURE RESERVE, 2018 & 2021

Note * denotes introduced species. OPPO= Oppurtunistic collection within nature reserve.

T denotes threatened flora; P1-P4 denote priority flora (DPaW 2019). (see Appendix A for definitions).

	SPECIES	KR01	KR02	KR03	KR04	KR05	KR06	KR07	KR08	KR09	KR10	KR11	KR12	KR13	KR14	KR15	KR16	OPPO
	Acacia blakelyi							X										
	Acacia ericifolia							X										
	Acacia lasiocarpa											X	X	X				
	Acacia pulchella	X	X															
	Acacia stenoptera			X														
	Acanthocarpus canaliculatus										X							
	Adenanthos cygnorum									X								
	?*Agrostocrinum* sp.	X	X															
*	*Aira caryophyllea*	X	X		X	X	X	X			X		X					
	Alexgeorgea nitens	X	X	X														
	Allocasuarina campestris						X	X	X	X		X	X					
	Allocasuarina humilis	X	X	X														
	Amphipogon caricinus												X					
	Amphipogon turbinatus	X	X	X														
	Anigozanthos humilis subsp. *humilis*	X	X	X														
	Aotus gracillima													X				
*	*Arctotheca calendula*				X	X				X	X				X	X		
	Aristida holathera							X										
	Asteraceae sp.								X									
	Atriplex lindleyi subsp. *inflata*										X							
	Austrostipa elegantissima		X	X			X							X				
	Austrostipa exilis														X			
	Austrostipa macalpinei				X					X								
	Austrostipa ?*macalpinei*	X	X	X				X										
	Austrostipa nitida										X							
	Austrostipa variabilis				X	X		X										
*	*Avena fatua*				X	X					X							
	Banksia attenuata	X	X	X														
	Banksia dallanneyi							X										
	Banksia fraseri								X	X								

APPENDIX H2: SUMMARY OF VASCULAR PLANT SPECIES RECORDED BY SITE AT KOODJEE NATURE RESERVE, 2018 & 2021

Note * denotes introduced species. OPPO= Oppurtunistic collection within nature reserve.

T denotes threatened flora; P1-P4 denote priority flora (DPaW 2019). (see Appendix A for definitions).

	SPECIES	KR01	KR02	KR03	KR04	KR05	KR06	KR07	KR08	KR09	KR10	KR11	KR12	KR13	KR14	KR15	KR16	OPPO
	Banksia menziesii			X														
	Banksia prionotes	X	X	X														
	Banksia sclerophylla									X		X						
	Banksia serratuloides subsp. *serratuloides* (T)									X		X						
	Blennospora drummondii							X	X	X								
	Borya sphaerocephala								X	X			X	X				
	Bossiaea eriocarpa	X		X														
*	*Brachypodium distachyon*				X	X												
	Brachyscome bellidioides	X	X	X			X											
*	*Brassica* sp.														X			
*	*Briza maxima*		X		X	X	X	X			X				X		X	
*	*Briza minor*				X													
*	*Bromus hordeaceus*					X												
*	*Bromus rubens*					X												
	Burchardia congesta									X								
	Caesia micrantha				X								X					
	Caladenia sp.	X					X			X		X						
	Calandrinia corrigioloides														X			
	Calectasia narragara			X														
	Calothamnus pachystachyus (P4)									X		X						
	Calothamnus quadrifidus subsp. *quadrifidus*							X										
	Calytrix depressa											X						
	Calytrix flavescens	X	X															
	Calytrix leschenaultii											X	X					
	Calytrix sapphirina									X								
	Cassytha sp.			X				X				X	X	X				
	Caustis dioica							X										
*	*Centaurium erythraea*				X													
	Centrolepis pilosa		X														X	
	Chaetospora curvifolia	X		X														

APPENDIX H2: SUMMARY OF VASCULAR PLANT SPECIES RECORDED BY SITE AT KOODJEE NATURE RESERVE, 2018 & 2021

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T denotes threatened flora; P1-P4 denote priority flora (DPaW 2019). (see Appendix A for definitions).

	SPECIES	KR01	KR02	KR03	KR04	KR05	KR06	KR07	KR08	KR09	KR10	KR11	KR12	KR13	KR14	KR15	KR16	OPPO
	Chamelaucium sp. Wongan Hills (B.H. Smith 1140) (P3)					X												
	Cheilanthes austrotenuifolia				X													
	Chordifex sinuosus		X	X														
	Comesperma integerrimum									X								
	Comesperma volubile							X						X				
	Conospermum stoechadis subsp. *stoechadis*	X	X	X														
	Conostylis aculeata subsp. *aculeata*	X	X	X														
	Conostylis androstemma									X		X						
	Conostylis crassinerva subsp. *absens*						X											
	Conostylis ?hiemalis					X												
	Conostylis prolifera																X	
	Conostylis setigera									X		X						
	Conostylis teretifolia subsp. *teretifolia*	X																
	Corynotheca sp.		X															
*	*Cotula bipinnata*										X							
*	*Cotula coronopifolia*										X					X	X	
	Crassula colorata var. *colorata*		X															
	Cryptandra nutans									X		X						
*	*Cynodon dactylon*										X							
	Dampiera lavandulacea								X	X		X						
	Dampiera spicigera							X										
	Daviesia ?divaricata													X				
	Daviesia angulata									X		X						
	Desmocladus asper				X		X		X						X		X	
	Desmocladus parthenicus	X	X	X														
	Dianella revoluta							X		X								
	Dichopogon capillipes													X				
	Dodonaea adenophora												X					
	Dodonaea divaricata												X	X				
	Dodonaea sp. (Juvenile)												X					

APPENDIX H2: SUMMARY OF VASCULAR PLANT SPECIES RECORDED BY SITE AT KOODJEE NATURE RESERVE, 2018 & 2021

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T denotes threatened flora; P1-P4 denote priority flora (DPaW 2019). (see Appendix A for definitions).

	SPECIES	KR01	KR02	KR03	KR04	KR05	KR06	KR07	KR08	KR09	KR10	KR11	KR12	KR13	KR14	KR15	KR16	OPPO
	Drosera humilis		X	X														
	Drosera leucoblasta													X				
	Drosera menziesii			X														
	Drosera miniata								X								X	
	Drosera sp.								X									
	Drosera sp. (Climbing)		X															
	Drosera sp. (Prostrate)						X	X										
	Drosera spilos	X	X							X		X	X					
	Drosera subhirtella								X	X			X					
*	*Ehrharta calycina*		X															
*	*Ehrharta longiflora*				X	X									X	X		
	Elythranthera brunonis								X									
	Eremaea beaufortioides			X				X										
	Ericomyrtus serpyllifolia									X		X	X					
	Ericomyrtus tenuior																	X
*	*Erodium botrys*				X	X												
	Eucalyptus rudis subsp. *rudis*															X		
	Eucalyptus salmonophloia			X														
	Eucalyptus sp.											X						
	Eucalyptus todtiana	X																
	Eucalyptus wandoo subsp. *wandoo*				X	X			X						X		X	
	Gastrolobium trilobum												X					
*	*Gladiolus caryophyllaceus*	X	X							X								
	Glischrocaryon aureum									X			X					
	Gnephosis tenuissima							X										
	Gompholobium marginatum												X					
	Gompholobium tomentosum	X	X	X														
	Gonocarpus nodulosus																X	
	Goodenia berardiana													X	X		X	
	Goodenia coerulea									X								

APPENDIX H2: SUMMARY OF VASCULAR PLANT SPECIES RECORDED BY SITE AT KOODJEE NATURE RESERVE, 2018 & 2021

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	SPECIES	KR01	KR02	KR03	KR04	KR05	KR06	KR07	KR08	KR09	KR10	KR11	KR12	KR13	KR14	KR15	KR16	OPPO
	Goodenia cycnopotamica													X				
	Goodenia drummondii subsp. *drummondii*													X				
	Goodenia micrantha								X					X				
	Goodenia reinwardtii		X															
	Haemodorum discolor																X	
	Haemodorum laxum									X								
	Haemodorum spicatum		X	X								X	X					
	Hakea ?erinacea												X					
	Hakea gilbertii									X		X						
	Hakea incrassata								X	X								
	Hemigenia diplanthera												X					
	Hibbertia acerosa									X		X						
	Hibbertia striata		X	X														
	Hibbertia subvaginata									X		X						
	Hibbertia sp.			X														
*	*Hordeum leporinum*					X										X		
*	*Hordeum* sp.										X							
	Hyalosperma cotula								X	X								
	Hyalosperma demissum													X				
	Hydrocotyle callicarpa								X					X				
*	*Hypochaeris glabra*	X	X	X	X	X	X	X			X				X		X	
*	*Hypochaeris radicata*		X			X												
	Isopogon dubius											X						
	Isotropis cuneifolia subsp. *cuneifolia*	X	X	X														
	Jacksonia angulata												X					
	Jacksonia nutans			X														
	Labichea lanceolata							X										X
	Lawrencella rosea								X					X				
	Laxmannia ramosa	X	X					X										
	Laxmannia sessiliflora subsp. *drummondii*									X								

APPENDIX H2: SUMMARY OF VASCULAR PLANT SPECIES RECORDED BY SITE AT KOODJEE NATURE RESERVE, 2018 & 2021

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T denotes threatened flora; P1-P4 denote priority flora (DPaW 2019). (see Appendix A for definitions).

	SPECIES	KR01	KR02	KR03	KR04	KR05	KR06	KR07	KR08	KR09	KR10	KR11	KR12	KR13	KR14	KR15	KR16	OPPO
*	*Leontodon rhagadioloides*				X	X									X			
	Lepidobolus preissianus	X	X	X			X	X										
	Lepidobolus preissianus subsp. *preissianus*									X								
	Lepidosperma sp.	X							X					X				
	Leptospermum erubescens							X										
	Leptospermum oligandrum							X										
	Levenhookia pusilla									X								
	Levenhookia stipitata	X	X	X			X	X				X	X					
	?*Lobelia* sp.								X	X		X						
*	*Lolium rigidum*										X							
	Lomandra caespitosa	X	X	X														
*	*Lupinus angustifolius*																X	
	Lyginia imberbis	X	X															
*	*Lysimachia arvensis*			X	X	X	X	X			X				X		X	
	Macrozamia fraseri				X													
*	*Medicago polymorpha*										X					X		
*	*Medicago truncatula*														X			
	Melaleuca acuminata subsp. *acuminata*													X				
	Melaleuca calyptroides											X						
	Melaleuca concreta												X	X				
	Melaleuca marginata													X				
	Melaleuca radula								X				X					
	Melaleuca rhaphiophylla															X		
	Melaleuca seriata	X	X	X				X										
	Melaleuca viminea subsp. *viminea*										X							
	Mesomelaena pseudostygia	X	X	X								X						
*	*Moraea setifolia*															X		
	Morelotia octandra							X										
	Neurachne alopecuroidea	X	X	X	X	X	X	X	X	X		X	X	X	X		X	
	Nuytsia floribunda	X																

APPENDIX H2: SUMMARY OF VASCULAR PLANT SPECIES RECORDED BY SITE AT KOODJEE NATURE RESERVE, 2018 & 2021

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	SPECIES	KR01	KR02	KR03	KR04	KR05	KR06	KR07	KR08	KR09	KR10	KR11	KR12	KR13	KR14	KR15	KR16	OPPO
	Opercularia vaginata			X						X		X						
*	*Orobanche minor*				X	X												
	Orthrosanthus laxus											X						
*	*Oxalis pes-caprae*					X					X					X		
	Panaetia lessonii				X										X			
*	*Parentucellia latifolia*				X	X									X			
*	*Pentameris airoides*				X	X	X							X			X	
	Petrophile brevifolia							X				X						
	Petrophile linearis		X	X														
	Petrophile macrostachya		X	X														
	Petrophile plumosa (P3)									X								
*	*Petrorhagia dubia*					X									X			
	Philydrella drummondii												X					
	Phyllangium ?sulcatum													X				
	Phyllangium paradoxum	X	X	X			X											
	Pimelea sp.								X			X						
	Plantago debilis													X				
	Platysace maxwellii													X				
	Podotheca angustifolia	X	X	X				X		X					X		X	
	Podotheca gnaphalioides		X	X		X	X	X				X						
	Poranthera microphylla		X		X					X								
	Pterochaeta paniculata											X						
	Pterostylis sp.								X									
	Ptilotus humilis				X	X												
	Ptilotus manglesii								X	X								
	Ptilotus polystachyus		X		X	X		X			X				X			
	Rhodanthe chlorocephala subsp. *rosea*																X	
	Rhodanthe laevis													X				
*	*Romulea rosea*				X						X			X	X			
	Rytidosperma acerosum				X													

APPENDIX H2: SUMMARY OF VASCULAR PLANT SPECIES RECORDED BY SITE AT KOODJEE NATURE RESERVE, 2018 & 2021

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	SPECIES	KR01	KR02	KR03	KR04	KR05	KR06	KR07	KR08	KR09	KR10	KR11	KR12	KR13	KR14	KR15	KR16	OPPO
	Rytidosperma setaceum	X	X	X														
	Schoenus ?sp. smooth culms (K.R. Newbey 7823)									X								
	Schoenus brevisetis	X	X	X						X								
	Schoenus clandestinus	X	X	X														
	Schoenus nanus						X						X					
	Schoenus ?*nanus*												X					
	Scholtzia laxiflora	X	X															
	Scholtzia parviflora																	X
*	*Silene gallica*																X	
*	*Silene gallica* var. *gallica*					X												
*	*Solanum nigrum*					X												
*	*Sonchus oleraceus*										X							
	Sowerbaea laxiflora				X								X				X	
*	*Spergula pentandra*														X			
	Spergularia marina															X		
*	*Spergularia rubra*										X							
	Sphaerolobium medium											X						
	Stenanthemum pomaderroides													X				
	Stirlingia latifolia	X	X	X														
	Stylidium adpressum			X														
	Stylidium neglectum													X				
	Stylidium piliferum		X															
	Stylidium purpureum	X								X								
	Stylidium repens	X	X							X		X						
	Stylidium sp. Moora (J.A. Wege 713) (P2)								X	X								
	Stylidium sp.								X	X								
	Stypandra glauca								X					X	X			
	Styphelia ?*conostephioides*			X														
	Styphelia ?*macrocalyx*			X														
	Styphelia serratifolia											X	X					

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T denotes threatened flora; P1-P4 denote priority flora (DPaW 2019). (see Appendix A for definitions).

	SPECIES	KR01	KR02	KR03	KR04	KR05	KR06	KR07	KR08	KR09	KR10	KR11	KR12	KR13	KR14	KR15	KR16	OPPO
	Synaphea ?acutiloba											X						
	Synaphea spinulosa subsp. *spinulosa*		X															
	Tecticornia lepidosperma										X							
	Tecticornia sp. 1															X		
	Tecticornia sp. 2															X		
	Thysanotus ?triandrus							X										
	Thysanotus manglesianus								X			X						
	Thysanotus patersonii		X					X										
	Thysanotus sp.						X											
	Thysanotus sp. (Climbing)	X																
	Trachymene cyanopetala												X					
	Trachymene ornata								X	X		X	X					
	Trachymene ?ornata													X				
	Trachymene pilosa	X	X	X	X	X	X	X				X			X		X	
*	*Trifolium* sp.										X							
	Triodia danthonioides						X	X										
*	*Ursinia anthemoides*	X	X	X	X		X	X			X				X		X	
	Verticordia chrysanthella											X	X					
	Verticordia densiflora var. *densiflora*							X										
	Verticordia huegelii var. *stylosa*												X					
*	*Vulpia myuros* forma *myuros*		X		X	X	X	X										
*	*Wahlenbergia capensis*	X	X	X				X										
	Wahlenbergia gracilenta							X										
	Wahlenbergia sp.				X													
	Waitzia acuminata var. *albicans*	X		X			X	X										
	Xanthorrhoea brunonis	X																
	Xanthorrhoea preissii	X	X									X						

APPENDIX I: COORDINATES OF VERTICES DELINEATING THE BOUNDARIES OF THE MINE SITE, PALEOCHANNEL, PIPELINE AND POTENTIAL BOREFIELD SURVEY AREAS OF THE CARAVEL COPPER PROJECT

Mine Site Survey Area

VERTEX	LOCATION (GDA94, Zone50)	
	mE	mN
0	459307	6570797
1	456706	6570801
2	456732	6571035
3	456735	6571060
4	456737	6571085
5	457516	6578090
6	462711	6575677
7	465090	6575415
8	465688	6574209

VERTEX	LOCATION (GDA94, Zone50)	
	mE	mN
9	467115	6573937
10	467225	6568803
11	465049	6568796
12	465059	6565921
13	460212	6565965
14	460210	6570359
15	460210	6570796
16	459307	6570797

Paleochannel Survey Area

VERTEX	LOCATION (GDA94, Zone50)	
	mE	mN
0	415686	6579528
1	417700	6577795
2	424634	6578047
3	427385	6576865
4	427425	6576612
5	427431	6576580
6	427436	6576548
7	427461	6576389
8	426963	6575993
9	424973	6577073
10	421125	6577130
11	418091	6577141
12	417979	6577141

VERTEX	LOCATION (GDA94, Zone50)	
	mE	mN
13	417481	6577143
14	413392	6579696
15	409633	6580287
16	407741	6580699
17	407698	6580709
18	407639	6580807
19	407497	6581045
20	407448	6581127
21	407322	6581337
22	407359	6581332
23	412211	6580556
24	415686	6579528

Pipeline Survey Area

VERTEX	LOCATION (GDA94, Zone50)	
	mE	mN
0	428699	6575806
1	427436	6576548
2	427431	6576580
3	427425	6576612
4	428670	6575881
5	428732	6575845
6	434545	6572433
7	435227	6572064
8	435272	6572040
9	436608	6571318
10	437118	6571316
11	437409	6571483
12	437413	6571485
13	437417	6571486
14	437421	6571486
15	437426	6571486
16	437430	6571484
17	437807	6571338
18	439381	6571160
19	439382	6571160
20	439387	6571159
21	439767	6571023
22	440422	6571008
23	441037	6571011
24	441137	6571011
25	443217	6571020
26	443734	6571021
27	444865	6571023
28	446220	6571032
29	447974	6571048
30	448498	6571046
31	448605	6571046
32	448678	6571046
33	449775	6571056
34	454616	6571085
35	456040	6571085
36	456103	6571085
37	456737	6571085

VERTEX	LOCATION (GDA94, Zone50)	
	mE	mN
38	456735	6571060
39	456732	6571035
40	454616	6571035
41	452312	6571021
42	452197	6571020
43	449775	6571006
44	448678	6570996
45	448110	6570997
46	447974	6570998
47	446221	6570982
48	444866	6570973
49	443878	6570971
50	443734	6570971
51	443217	6570970
52	440422	6570958
53	440421	6570958
54	439762	6570973
55	439758	6570973
56	439754	6570974
57	439372	6571111
58	437798	6571289
59	437797	6571289
60	437792	6571290
61	437424	6571433
62	437137	6571269
63	437133	6571267
64	437129	6571266
65	437125	6571266
66	436602	6571268
67	436597	6571268
68	436593	6571269
69	436590	6571271
70	434521	6572389
71	434520	6572390
72	432509	6573570
73	432422	6573621
74	428828	6575730
75	428699	6575806

Potential Borefield Survey Area

VERTEX	LOCATION (GDA94, Zone50)	
	mE	mN
0	404855	6583248
1	405210	6583554
2	405565	6583859
3	405930	6584175
4	406296	6584490
5	406326	6584516
6	406628	6584519
7	406930	6584521
8	407002	6584522
9	407167	6584523
10	407187	6584524
11	407219	6584272
12	407251	6584020
13	407254	6583996
14	407257	6583964
15	407258	6583931
16	407257	6583898
17	407255	6583866
18	407251	6583833
19	407245	6583801
20	407237	6583769
21	407227	6583738
22	407069	6583280
23	406912	6582822
24	406890	6582766
25	406866	6582710
26	406840	6582656
27	406811	6582601
28	406799	6582578
29	406789	6582554
30	406780	6582530
31	406773	6582505
32	406767	6582479
33	406763	6582454
34	406761	6582428
35	406760	6582402
36	406760	6582375
37	406763	6582349
38	406766	6582324

VERTEX	LOCATION (GDA94, Zone50)	
	mE	mN
39	406772	6582298
40	406779	6582273
41	406787	6582248
42	406797	6582224
43	406809	6582201
44	406821	6582178
45	407030	6581827
46	407168	6581596
47	407175	6581584
48	407239	6581477
49	407322	6581337
50	407448	6581127
51	407497	6581045
52	407639	6580807
53	407698	6580709
54	407780	6580570
55	407801	6580532
56	407821	6580493
57	407837	6580452
58	407852	6580411
59	407864	6580370
60	407874	6580327
61	407882	6580284
62	407887	6580241
63	407889	6580197
64	407889	6580154
65	407887	6580110
66	407860	6579782
67	407834	6579454
68	407810	6579163
69	407786	6578872
70	407784	6578841
71	407785	6578810
72	407787	6578779
73	407790	6578748
74	407796	6578717
75	407803	6578687
76	407812	6578657
77	407823	6578628

VERTEX	LOCATION (GDA94, Zone50)	
	mE	mN
78	407836	6578599
79	407850	6578572
80	407866	6578545
81	407883	6578519
82	407902	6578494
83	407923	6578470
84	407944	6578448
85	408118	6578278
86	408164	6578235
87	408212	6578195
88	408261	6578157
89	408559	6577943
90	408856	6577729
91	408956	6577658
92	408942	6577622
93	408805	6577569
94	408528	6577460
95	408269	6577459
96	408011	6577458
97	407863	6577380
98	407843	6577370
99	407506	6577197
100	407445	6577171
101	407351	6577150
102	407294	6577147
103	407288	6577147
104	407066	6577150
105	406874	6577133
106	406492	6577139
107	406099	6577145
108	405707	6577151
109	405295	6577158
110	404883	6577164
111	404582	6577169

VERTEX	LOCATION (GDA94, Zone50)	
	mE	mN
112	404280	6577174
113	404107	6577176
114	403662	6577183
115	403217	6577190
116	402772	6577197
117	402752	6577218
118	402748	6577696
119	402744	6578174
120	402741	6578653
121	402737	6579131
122	402737	6579151
123	402734	6579489
124	402733	6579579
125	402733	6579635
126	402731	6579826
127	402729	6580164
128	402726	6580566
129	402723	6580968
130	402719	6581370
131	402716	6581771
132	402714	6582115
133	402714	6582135
134	402713	6582225
135	402709	6582718
136	402709	6582776
137	402708	6582787
138	402705	6583211
139	402725	6583231
140	403151	6583234
141	403577	6583238
142	404003	6583241
143	404429	6583244
144	404855	6583248

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description

Vegetation map code: RB01

Vegetation community description

Eucalyptus rudis subsp. *rudis* low isolated clumps of trees over *Melaleuca viminea* subsp. *viminea*, *Melaleuca rhaphiophylla* tall sparse shrubland over *Tecticornia lepidosperma, *Cynodon dactylon, *Arctotheca calendula* low forbland

Statistically associated species

n/a

Occasional species:

**Cotula coronopifolia, *Oxalis pes-caprae, *Medicago polymorpha, *Briza maxima, *Ehrharta longiflora*

Soils and Landforms: grey clay soils on river banks

Surface rocks: laterite pebbles

Outcropping: not present

Condition: degraded – introduced species

Area: 2.98 ha

Proportion of survey area: 2.26%

Number of Quadrats: 2

Average species richness: 16.00 ± 5.50 (s.e.m.)

Range of species richness: 10 - 22

Similarity Percentage: 0.00 %

Representative Photograph

Quadrat KR10

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description	
Vegetation map code: S01	
Vegetation community description	
Allocasuarina campestris, Calothamnus quadrifidus subsp*. quadrifidus, Acacia blakelyi* tall open shrubland over *Lepidobolus preissianus, Melaleuca seriata, Acacia ericifolia* low open shrubland over *Triodia danthonioides* low sparse hummock grassland	
Statistically associated species	
n/a	
Occasional species:	
Verticordia densiflora var*. densiflora, Labichea lanceolata, Leptospermum oligandrum, Petrophile brevifolia, Eremaea beaufortioides and Leptospermum erubescens*	
Soils and Landforms: brown sandy loam on flats	
Surface rocks: not present	Outcropping: not present
Condition: excellent	
Area: 0.45ha	Proportion of survey area: 0.34%
Number of Quadrats: 1	Average species richness: n/a
Range of species richness: 43	Similarity Percentage: n/a

Representative Photograph

Quadrat KR07

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description

Vegetation map code: B01

Vegetation community description

Banksia attenuata, Banksia prionotes low open woodland over *Allocasuarina humilis, Melaleuca seriata, Conospermum stoechadis* subsp*. stoechadis* mid sparse shrubland over *Alexgeorgea nitens, Mesomelaena pseudostygia, Amphipogon turbinatus* low sparse rushland

Statistically associated species

Schoenus clandestinus, Gompholobium tomentosum, Stirlingia latifolia, Anigozanthos humilis subsp*. humilis, Conostylis aculeata* subsp*. aculeata, Desmocladus parthenicus, Neurachne alopecuroidea*

Occasional species:

*Eucalyptus todtiana, Xanthorrhoea brunonis, Banksia menziesii, Goodenia reinwardtii, Bossiaea eriocarpa, Xanthorrhoea preissii, Eremaea beaufortioides, *Ursinia anthemoides*

Soils and Landforms: Cream/ white sand on flats and slopes

Surface rocks: not present

Outcropping: not present

Condition: excellent

Area: 59.73ha

Proportion of survey area: 45.29%

Number of Quadrats: 3

Average species richness: 54.00 ± 3.79 (s.e.m.)

Range of species richness: 47 to 61

Similarity Percentage: 71.50 %

Representative Photograph

Quadrat KR02

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description	
Vegetation map code: E01	
Vegetation community description	
Eucalyptus wandoo mid open woodland over *Neurachne alopecuroidea* low grassland	
Statistically associated species:	
n/a	
Occasional species:	
**Vulpia myuros* forma *myuros, *Aira caryophyllea, *Bromus rubens, *Cotula coronopifolia, Rhodanthe chlorocephala* subsp*. rosea, * Hypochaeris glabra, Ptilotus humilis, * Hypochaeris radicata, Ptilotus polystachyus, Macrozamia fraseri, Desmocladus asper, Chamelaucium* sp. Wongan Hills (B.H. Smith 1140) (P3)	
Soils and Landforms: orange brown clay loam to clayey sand soils on floodplains	
Surface rocks: not present	Outcropping: not present
Condition: good – grazing/ introduced species	
Area: 32.42 ha	Proportion of survey area: 24.58%
Number of Quadrats: 4	Average species richness: 27 ± 3.2 (s.e.m.)
Range of species richness: 21 to 33	Similarity Percentage: 50.60 %

Representative Photograph

Quadrat KR16

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description

Vegetation map code: S02

Vegetation community description

Allocasuarina campestris tall sparse shrubland over *Calothamnus pachystachyus* (P4), *Banksia sclerophylla, Banksia serratuloides* subsp. *serratuloides* (T) mid open shrubland over *Hibbertia acerosa, Conostylis androstemma, Ericomyrtus serpyllifolia* low sparse shrubland

Statistically associated species:

Daviesia angulate, Hakea gilbertii

Occasional species:

Calytrix depressa, Opercularia vaginata, Melaleuca calyptroides, Petrophile plumosa (P3), *Adenanthos cygnorum, Calytrix leschenaultia, Glischrocaryon aureum, Isopogon dubius*

Soils and Landforms: gravelly orange to light brown clayey loam soils on flats

Surface rocks: laterite gravel

Outcropping: not present

Condition: pristine

Area: 2.00 ha

Proportion of survey area: 1.52 %

Number of Quadrats: 2

Average species richness: 42 ± 2.50 (s.e.m.)

Range of species richness: 38 to 46

Similarity Percentage: 57.62 %

Representative Photograph

Quadrat KR09

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description

Vegetation map code: S03

Vegetation community description

Melaleuca concreta mid sparse shrubland over *Acacia lasiocarpa* low sparse shrubland over *Borya sphaerocephala* low sparse forbland

Statistically associated species:

n/a

Occasional species:

Verticordia chrysanthella, Melaleuca marginata, Melaleuca acuminata subsp*. acuminata, Amphipogon caricinus, Hakea erinacea, Jacksonia angulate, Melaleuca radula, Levenhookia stipitate, Dodonaea Adenophora, Ericomyrtus serpyllifolia, Glischrocaryon aureum*

Soils and Landforms: grey to light brown clayey loam soils on flats

Surface rocks: surface gravel

Outcropping: not present

Condition: pristine

Area: 5.06 ha

Proportion of survey area: 3.83 %

Number of Quadrats: 2

Average species richness: 32 ± 1.50 (s.e.m.)

Range of species richness: n/a

Similarity Percentage: 30.90 %

Representative Photograph

Quadrat KR13

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description

Vegetation map code: A01

Vegetation community description

Eucalyptus wandoo subsp*. wandoo* mid open woodland over *Allocasuarina campestris* tall closed shrubland over *Melaleuca radula* mid isolated clumps of shrubs

Statistically associated species

n/a

Occasional species:

*Triodia danthonioides, *Aira caryophyllea, Banksia fraseri, *Hypochaeris glabra, Neurachne alopecuroidea, Desmocladus asper, Lepidobolus preissianus*

Soils and Landforms: orange brown clay loam on flats and slopes

Surface rocks: not present

Outcropping: not present

Condition: excellent

Area: 2.94 ha

Proportion of survey area: 2.23%

Number of Quadrats: 2

Average species richness: 21.5 ± 2.00 (s.e.m.)

Range of species richness: 21 to 22

Similarity Percentage: 40.33 %

Representative Photograph

Quadrat KR06

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description

Vegetation map code: L01

Vegetation community description

Casuarina obesa low open woodland over *Melaleuca viminea* subsp*. viminea, Melaleuca scalena* tall shrubland over *Lepidosperma* sp. tall closed sedgeland

Statistically associated species

n/a

Occasional species:

*Allocasuarina huegeliana, Machaerina juncea, Machaerina articulata, Triglochin minutissima, *Juncus acutus, Acacia acuminata, Brachyscome pusilla, Stypandra glauca*

Soils and Landforms: yellow to brown sandy clay loam soils in seasonally inundated wetland

Surface rocks: not present

Outcropping: few granite

Condition: good to excellent

Area: 30.39 ha

Proportion of survey area: 0.38%

Number of Quadrats: 4

Average species richness: 6.3 ± 1.97 (s.e.m.)

Range of species richness: 3 to 11

Similarity Percentage: 23.35 %

Representative Photograph

Quadrat MS59

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description	
Vegetation map code: C01	
Vegetation community description	
Casuarina obesa low open woodland over *Grevillea levis, Dodonaea pinifolia, Ericomyrtus serpyllifolia* mid open shrubland over *Styphelia serratifolia, Ecdeiocolea monostachya* low sparse shrubland	
Statistically associated species	
n/a	
Other species:	
Acacia neurophylla subsp*. neurophylla, Acacia dielsii, Lepidosperma asperatum*	
Soils and Landforms: pale brown to grey sandy loam on flats	
Surface rocks: surface gravel	Outcropping: few laterite
Condition: pristine	
Area: 2.44 ha	Proportion of survey area: 0.03 %
Number of Quadrats: 1	Average species richness: n/a
Range of species richness: 33	Similarity Percentage: n/a

Representative Photograph

Quadrat MS58

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description

Vegetation map code: Ca01

Vegetation community description

Callitris arenaria tall open shrubland over *Rhagodia preissii* subsp. *preissii*, *Hakea* ?*circumalata*, *Melaleuca* ?*halmaturorum* mid sparse shrubland over *Calandrinia granulifera, Eragrostis dielsii, Tecticornia lepidosperma* low sparse shrubland

Statistically associated species

n/a

Occasional species:

**Ursinia anthemoides*

Soils and Landforms: orange brown to white clayey sand on edge of salt lake

Surface rocks: not present

Outcropping: not present

Condition: excellent

Area: 2.06 ha

Proportion of survey area: 0.03 %

Number of Quadrats: 1

Average species richness: n/a

Range of species richness: 24

Similarity Percentage: n/a

Representative Photograph

Quadrat MS52

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description

Vegetation map code: T01

Vegetation community description

Eucalyptus loxophleba subsp*. loxophleba* low isolated clumps of mallee trees over *Thryptomene mucronulata, Rhagodia preissii* subsp*. preissii, Hakea* ?*circumalata* mid sparse shrubland over *Tecticornia lepidosperma, Tecticornia pergranulata* subsp*. pergranulata, Triglochin mucronata* tall samphire shrubland

Statistically associated species

n/a

Occasional species:

*Eragrostis dielsii. Melaleuca concreta, *Lolium rigidum, *Vulpia muralis, Tecticornia indica* subsp*. bidens, Austrostipa elegantissima, *Cotula bipinnata*

Soils and Landforms: brown to black loamy sand or white sand with pink/grey clay on seasonally inundated wetland/ salt lakes

Surface rocks: not present

Outcropping: not present

Condition: very good

Area: 782.29 ha

Proportion of survey area: 9.65%

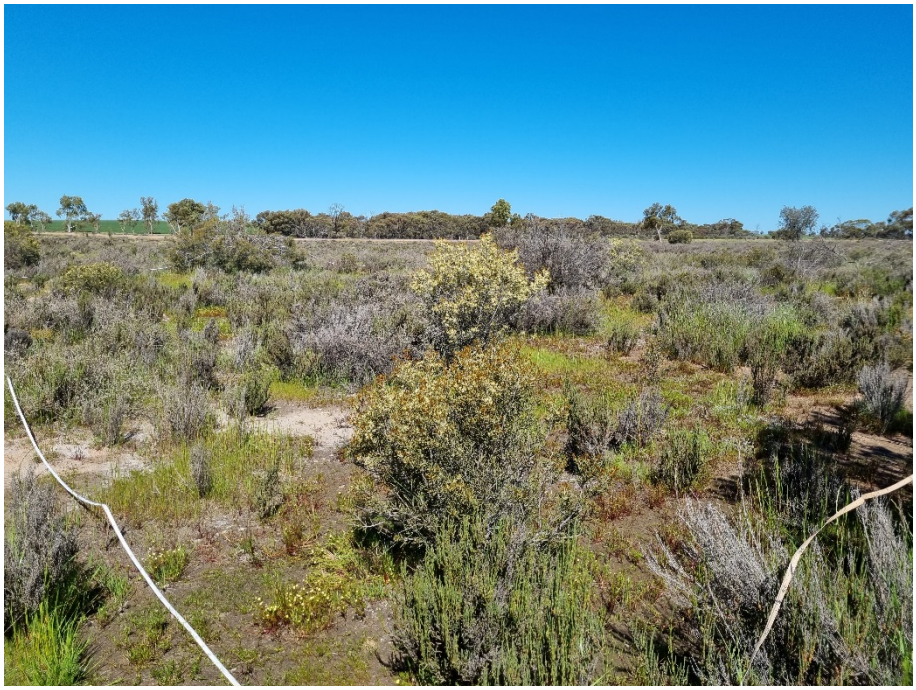
Number of Quadrats: 11

Average species richness: 16 ± 3.25 (s.e.m.)

Range of species richness: 6 to 42

Similarity Percentage: 24.18 %

Representative Photograph



Quadrat MS49

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description	
Vegetation map code: Ed01	
Vegetation community description	
Eucalyptus spp. mid to tall woodland over *Enchylaena lanata* low isolated clumps of shrubs	
Statistically associated species	
n/a	
Occasional species:	
Rhagodia preissii subsp. *preissii, Acacia lasiocarpa, *Lolium rigidum, * Ehrharta longiflora, * Brassica tournefortii, Calothamnus quadrifidus* subsp. *quadrifidus, Crassula colorata* var. *acuminata, Mesembryanthemum nodiflorum, *Arctotheca calendula, *Ehrharta calycina, Eucalyptus capillosa*	
Soils and Landforms: brown loamy sand on flats	
Surface rocks: not present	Outcropping: not present
Condition: degraded – introduced species	
Area: 10.76 ha	Proportion of survey area: 0.13 %
Number of Quadrats: 3	Average species richness: 19 ± 0.33 (s.e.m.)
Range of species richness: 16 to 21	Similarity Percentage: 5.74 %

Representative Photograph

Quadrat MS44

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description	
Vegetation map code: S04	
Vegetation community description	
Grevillea hookeriana subsp*. hookeriana* mid sparse shrubland over *Desmocladus asper* low open rushland	
Statistically associated species	
n/a	
Occasional species:	
*Pericalymma ellipticum, Acacia dilatata, Austrostipa elegantissima, Dianella revoluta, * Ehrharta calycina*	
Soils and Landforms: light grey to brown sand on flats	
Surface rocks: not present	Outcropping: not present
Condition: very good	
Area: 10.73 ha	Proportion of survey area: 0.13 %
Number of Quadrats: 2	Average species richness: 17.5 ± 3.00 (s.e.m.)
Range of species richness: 15 to 20	Similarity Percentage: 32.86 %

Representative Photograph

Quadrat MS47

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description	
Vegetation map code: S05	
Vegetation community description	
Melaleuca lateriflora tall sparse shrubland over *Rhagodia preissii* subsp*. preissii* low open shrubland	
Statistically associated species	
n/a	
Occasional species:	
Crassula sp*., Acacia neurophylla* subsp*. neurophylla, Brachyscome bellidioides, Calandrinia granulifera, * Vulpia muralis, Grevillea levis, Melaleuca halmaturorum, Siemssenia capillaris, Dianella revoluta, Melaleuca scalena, *Hypochaeris glabra, Aristida contorta, Dampiera lavandulacea, Calandrinia eremaea, * Aira caryophyllea*	
Soils and Landforms: grey brown sandy clay on flats	
Surface rocks: not present	Outcropping: not present
Condition: very good to excellent	
Area: 26.41 ha	Proportion of survey area: 0.33 %
Number of Quadrats: 2	Average species richness: 34 ± 2.00 (s.e.m.)
Range of species richness: 32 to 36	Similarity Percentage: 45.20 %

Representative Photograph

Quadrat MS53

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description	
Vegetation map code: Sw01	
Vegetation community description	
Melaleuca viminea subsp. *viminea, Acacia blakelyi* tall closed shrubland	
Statistically associated species	
n/a	
Occasional species:	
*Jacksonia fasciculata, *Juncus acutus, Rhagodia preissii* subsp. *preissii, Thryptomene mucronulata, Comesperma integerrimum*	
Soils and Landforms: grey to black sandy loam – seasonally inundated swampland	
Surface rocks: not present	Outcropping: not present
Condition: good to excellent	
Area: 5.01 ha	Proportion of survey area: 0.06 %
Number of Quadrats: 2	Average species richness: 6 ± 0.50 (s.e.m.)
Range of species richness: 4 to 8	Similarity Percentage: 51.21%

Representative Photograph

Quadrat MS62

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description	
Vegetation map code: M01	
Vegetation community description	
Maireana brevifolia low isolated clumps of chenopod shrubs over **Bromus rubens, *Brassica ×napus* low grassland	
Statistically associated species	
n/a	
Occasional species:	
*Eucalyptus virella, Eucalyptus armillata, *Sonchus oleraceus*	
Soils and Landforms: red brown clay loam on edge of salt lake	
Surface rocks: not present	Outcropping: not present
Condition: degraded – introduced species	
Area: 2.13 ha	Proportion of survey area: 0.03 %
Number of Quadrats: 1	Average species richness: n/a
Range of species richness: 6	Similarity Percentage: n/a

Representative Photograph

Quadrat MS30

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description

Vegetation map code: S06

Vegetation community description

Eucalyptus ebbanoensis subsp*. ebbanoensis, Eucalyptus loxophleba* low isolated clumps of trees over *Thryptomene racemulosa, Leptospermum roei* tall open shrubland over *Austrostipa hemipogon* tall sparse grassland

Statistically associated species

n/a

Occasional species:

Melaleuca sp.*, *Arctotheca calendula, Acacia nigripilosa* subsp. *nigripilosa, Acacia acuminata, Ericomyrtus serpyllifolia, Santalum acuminatum, Gastrolobium calycinum, Grevillea petrophiloides, Hypocalymma suave, Opercularia vaginata, Hakea meisneriana, Acacia oswaldii*

Soils and Landforms: grey brown sandy clay loam soils on flats

Surface rocks: surface gravel

Outcropping: not present

Condition: degraded to very good – introduced species

Area: 0.71 ha

Proportion of survey area: 0.01 %

Number of Quadrats: 2

Average species richness: 23.5 ± 4.50 (s.e.m.)

Range of species richness: 19 to 28

Similarity Percentage: 19.72 %

Representative Photograph

Quadrat MS91

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description

Vegetation map code: Ed02

Vegetation community description

Eucalyptus wandoo, Eucalyptus salmonophloia mid open woodland over *Acacia acuminata* tall sparse shrubland over *Austrostipa hemipogon* tall open grassland

Statistically associated species

n/a

Occasional species:

**Ehrharta calycina, Eucalyptus loxophleba* subsp*. loxophleba, *Arctotheca calendula, Eucalyptus yilgarnensis, *Moraea flaccida, Eucalyptus loxophleba, *Lolium rigidum, *Centaurea melitensis, *Cotula bipinnata, Neurachne alopecuroidea, *Vulpia muralis, Rhagodia preissii* subsp*. preissii, Acacia nigripilosa* subsp. *nigripilosa, Casuarina obesa*

Soils and Landforms: grey brown sandy clay loam soils on flats

Surface rocks: surface gravel

Outcropping: not present

Condition: degraded to good – road side/ introduced species

Area: 7.91 ha

Proportion of survey area: 0.10 %

Number of Quadrats: 5

Average species richness: 13.4 ± 1.67 (s.e.m.)

Range of species richness: 8 to 17

Similarity Percentage: 34.72 %

Representative Photograph

Quadrat MS86

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description

Vegetation map code: S07

Vegetation community description

Melaleuca scalena, Melaleuca hamulosa tall shrubland

Statistically associated species

n/a

Occasional species:

*Calandrinia calyptrate, Crassula exserta, Enchylaena lanata, *Hypochaeris glabra, Podotheca angustifolia, Rhagodia drummondii, Thryptomene mucronulata, Thysanotus patersonii*

Soils and Landforms: brown sand on flats

Surface rocks: not present

Outcropping: not present

Condition: very good

Area: 1.52 ha

Proportion of survey area: 0.02 %

Number of Quadrats: 1

Average species richness: n/a

Range of species richness: 10

Similarity Percentage: n/a

Representative Photograph

Quadrat MS63

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description	
Vegetation map code: B02	
Vegetation community description	
Banksia prionotes mid open woodland over *Rhagodia drummondii, Comesperma volubile, Scholtzia drummondii* mid sparse shrubland over *Ehrharta calycina* tall grassland	
Statistically associated species	
n/a	
Occasional species:	
*Dianella revoluta, * Hypochaeris glabra, *Ursinia anthemoides, *Sonchus oleraceus*	
Soils and Landforms: brown loamy sand soils on flats	
Surface rocks: not present	Outcropping: not present
Condition: poor – introduced species	
Area: 2.90 ha	Proportion of survey area: 0.04 %
Number of Quadrats: 1	Average species richness: n/a
Range of species richness: 10	Similarity Percentage: n/a

Representative Photograph

Quadrat MS64

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description	
Vegetation map code: C02	
Vegetation community description	
Casuarina obesa mid woodland over *Hakea preissii, Rhagodia drummondii, *Juncus acutus* tall open rushland over * *Bromus hordeaceus* low grassland	
Statistically associated species	
n/a	
Occasional species:	
**Romulea rosea, * Bromus diandrus, * Hordeum leporinum, Isolepis cernua, * Ursinia anthemoides*	
Soils and Landforms: black sandy loam soils on flats	
Surface rocks: not present	Outcropping: not present
Condition: good – introduced species	
Area: 4.24 ha	Proportion of survey area: 0.05 %
Number of Quadrats: 1	Average species richness: n/a
Range of species richness: 13	Similarity Percentage: n/a

Representative Photograph

Quadrat MS65

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description
Vegetation map code: E02
Vegetation community description
Eucalyptus loxophleba subsp*. loxophleba, Eucalyptus loxophleba* subsp*. supralaevis* mid open forest over *Acacia acuminata, Santalum acuminatum, Allocasuarina campestris* tall sparse shrubland over **Avena barbata, *Ehrharta calycina, Austrostipa scabra* subsp*. scabra* tall closed grassland
Statistically associated species
n/a
Occasional species:
**Arctotheca calendula, *Eragrostis curvula, Eucalyptus arachnaea* subsp*. arachnaea, Eucalyptus loxophleba, Eucalyptus wandoo* subsp*. wandoo, Ptilotus polystachyus, Acacia acuaria, *Hordeum leporinum, Melaleuca adnate, *Mesembryanthemum nodiflorum, Rhagodia preissii* subsp*. preissii, Brachyscome pusilla*
Soils and Landforms: orange brown sandy clay loam soils on flats and slopes
Surface rocks: laterite gravel — Outcropping: few laterite/ granite
Condition: degraded to very good – introduced species
Area: 18.11 ha — Proportion of survey area: 0.22 %
Number of Quadrats: 6 — Average species richness: 9.5 ± 3.08 (s.e.m.)
Range of species richness: 5 to 15 — Similarity Percentage: 17.97 %
Representative Photograph

Quadrat MS11

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description

Vegetation map code: S08

Vegetation community description

Santalum murrayanum, Melaleuca acuminata tall sparse shrubland over *Chamelaucium* sp. Wongan Hills (B.H. Smith 1140) (P3), *Melaleuca hamulosa, Rhagodia* sp. Watheroo (R.J. Cranfield & P.J. Spencer 8183) low open shrubland over *Austrostipa elegantissima* tall sparse grassland

Statistically associated species

n/a

Occasional species:

Grevillea hakeoides subsp*. hakeoides, Melaleuca vinnula, Melaleuca adnate, Siemssenia capillaris, Grevillea levis, Acanthocarpus canaliculatus, Conostylis aculeata* subsp*. bromelioides, Enchylaena lanata, Podotheca gnaphalioides, Melaleuca laxiflora*

Soils and Landforms: pale orange sandy clay loam on flats

Surface rocks: not present

Outcropping: not present

Condition: excellent

Area: 6.67 ha

Proportion of survey area: 0.08%

Number of Quadrats: 2

Average species richness: 14 ± 1.50 (s.e.m.)

Range of species richness: 12 to 16

Similarity Percentage: 37.08 %

Representative Photograph

Quadrat MS28

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description

Vegetation map code: A02

Vegetation community description

Allocasuarina campestris, Acacia acuminata tall shrubland over *Ecdeiocolea monostachya, Waitzia acuminata, Borya sphaerocephala* low forbland

Statistically associated species

n/a

Occasional species:

Allocasuarina huegeliana, Eucalyptus arachnaea subsp*. arrecta* (P3), *Eucalyptus loxophleba* subsp*. supralaevis, *Aira caryophyllea, * Avena barbata, Allocasuarina acutivalvis, Leptospermum erubescens, Acacia lasiocarpa, Dodonaea viscosa* subsp*. angustissima, Eucalyptus virella, Santalum spicatum, Eucalyptus wandoo* subsp*. wandoo, Enchylaena lanata, Calytrix depressa, Stylidium neglectum*

Soils and Landforms: red to brown sandy clay loam soils on flats

Surface rocks: occasional laterite gravel

Outcropping: moderate granite

Condition: poor to very good – introduced species/ waste dumping

Area: 33.08 ha

Proportion of survey area: 0.41 %

Number of Quadrats: 14

Average species richness: 16.9 ± 2.33 (s.e.m.)

Range of species richness: 9 to 43

Similarity Percentage: 18.74 %

Representative Photograph

Quadrat MS12

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description	
Vegetation map code: E03	
Vegetation community description	
Eucalyptus wandoo low open woodland over *Acacia brumalis, Banksia hewardiana* tall sparse shrubland	
Statistically associated species	
n/a	
Occasional species:	
**Brassica × napus, Acacia aculeiformis, Stenanthemum pomaderroides, *Pentameris airoides, Enchylaena lanata, *Mesembryanthemum nodiflorum, Santalum acuminatum*	
Soils and Landforms: grey brown clay loam soils on flats	
Surface rocks: laterite surface gravel	Outcropping: few laterite
Condition: degraded to good – introduced species	
Area: 3.35 ha	Proportion of survey area: 0.04 %
Number of Quadrats: 3	Average species richness: 13 ± 1.73 (s.e.m.)
Range of species richness: 10 to 15	Similarity Percentage: 30.81 %

Representative Photograph

Quadrat MS15

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description

Vegetation map code: E04

Vegetation community description

Eucalyptus salmonophloia tall open woodland over *Melaleuca marginata, Maireana brevifolia, Eremophila drummondii,* mid open shrubland over *Enchylaena lanata* tall sparse chenopod shrubland

Statistically associated species

Rhagodia preissii subsp*. preissii*

Occasional species:

Erymophyllum ramosum subsp*. ramosum, * Lolium perenne, Eucalyptus loxophleba* subsp*. supralaevis, Eucalyptus pileate, Atriplex semibaccata, *Mesembryanthemum nodiflorum, *Avena fatua, Rytidosperma caespitosum, Eucalyptus loxophleba*

Soils and Landforms: red brown clay loam soils on flats

Surface rocks: surface laterite gravel

Outcropping: few granite

Condition: good to very good

Area: 19.06 ha

Proportion of survey area: 0.24 %

Number of Quadrats: 6

Species richness: 12.2 ± 0.71 (s.e.m.)

Range of species richness: 10 to 14

Similarity Percentage: 24.55 %

Representative Photograph

Quadrat MS16

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description	
Vegetation map code: Ed03	
Vegetation community description	
Eucalyptus celastroides subsp. *virella* low woodland over *Enchylaena lanata, *Mesembryanthemum nodiflorum, Austrostipa elegantissima* low sparse forbland	
Statistically associated species	
n/a	
Occasional species:	
n/a	
Soils and Landforms: brown red clayey loam soils on flats and slopes	
Surface rocks: not present	Outcropping: few granite
Condition: degraded – introduced species	
Area: 1.02 ha	Proportion of survey area: 0.01 %
Number of Quadrats: 1	Average species richness: n/a
Range of species richness: 4	Similarity Percentage: n/a

Representative Photograph

Quadrat MS26

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description

Vegetation map code: E05

Vegetation community description

Eucalyptus horistes mid open woodland over *Rhagodia drummondii, Hakea preissii, Melaleuca scalena* mid sparse shrubland over *Triodia danthonioides, Eragrostis dielsii, Austrostipa nitida* tall sparse grassland

Statistically associated species

n/a

Occasional species:

**Vulpia muralis, *Brassica tournefortii, Calandrinia calyptrata, Acanthocarpus canaliculatus, Dianella revoluta*

Soils and Landforms: cream sandy soils on flats

Surface rocks: not present

Outcropping: not present

Condition: very good

Area: 8.30 ha

Proportion of survey area: 0.10 %

Number of Quadrats: 1

Average species richness: n/a

Range of species richness: 27

Similarity Percentage: n/a

Representative Photograph

Quadrat MS68

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description

Vegetation map code: C03

Vegetation community description

Casuarina obesa mid open woodland over *Grevillea hookeriana* subsp*. hookeriana, Rhagodia drummondii, *Juncus acutus* mid sparse shrubland over **Ehrharta calycina* tall sparse grassland

Statistically associated species

n/a

Occasional species:

Melaleuca viminea subsp*. viminea, *Romulea rosea, Grevillea levis, *Avena fatua, *Hypochaeris glabra, *Sonchus oleraceus*

Soils and Landforms: black sandy loam on edge of salt lake

Surface rocks: not present

Outcropping: not present

Condition: very good

Area: 7.25 ha

Proportion of survey area: 0.09 %

Number of Quadrats: 1

Average species richness: n/a

Range of species richness: 20

Similarity Percentage: n/a

Representative Photograph

Quadrat MS66

APPENDIX J: SUMMARY OF VEGETATION COMMUNITIES DEFINED WITHIN THE CALINGIRI COPPER PROJECT COMBINED SURVEY AREA, 2021

Vegetation Community Description

Vegetation map code: S09

Vegetation community description

Melaleuca lateriflora, Melaleuca adnata tall sparse shrubland over *Rhagodia drummondii, Enchylaena lanata, Tecticornia indica* subsp. *bidens* low open chenopod shrubland over **Lolium rigidum* tall sparse grassland

Statistically associated species

n/a

Occasional species:

*Tecticornia lepidosperma, Crassula exserta, *Hordeum leporinum, *Pentameris airoides, Pogonolepis stricta, Siemssenia capillaris*

Soils and Landforms: brown to black sandy loam on flats and edge of lakes

Surface rocks: not present

Outcropping: not present

Condition: poor to good – introduced species

Area: 13.12 ha

Proportion of survey area: 0.16 %

Number of Quadrats: 2

Average species richness: 22 ± 2.50 (s.e.m.)

Range of species richness: 20 to 24

Similarity Percentage: 51.98 %

Representative Photograph

Quadrat MS67

APPENDIX K: VASCULAR PLANT SPECIES RECORDED IN EACH VEGETATION COMMUNITY IN THE CARAVEL COPPER PROJECT AREA

Note: * denotes an introduced species; P1 - P4 denotes prioirity taxon (DBCA 2017a, WAH 1998-).

	SPECIES	A01	A02	B01	B02	C01	C02	C03	Ca01	E01	E02	E03	E04	E05	Ed01	Ed02	Ed03	L01	M01	Rb01	S01	S02	S03	S04	S05	S06	S07	S08	S09	Sw01	T01
	Abutilon cryptopetalum		X																												
	Acacia acuaria		X								X	X				X															
	Acacia aculeiformis		X								X	X																			
	Acacia acuminata		X								X					X		X							X						
	Acacia blakelyi																				X										
	Acacia ?blakelyi																							X						X	
	Acacia ?brumalis		X									X																			
	Acacia daviesioides					X																									
	Acacia dielsii					X																									
	Acacia dilatata																							X							
	Acacia ericifolia																				X										
	Acacia erinacea												X			X															
	Acacia ?jacksonioides															X															
	Acacia lasiocarpa																					X	X								
	Acacia ?lasiocarpa														X																
	Acacia lasiocarpa var. *sedifolia*		X																												
	Acacia microbotrya		X																												
	Acacia neurophylla subsp. *neurophylla*					X																			X						
	Acacia nigripilosa																												X		
	Acacia nigripilosa subsp nigripilosa															X										X					
	Acacia orbifolia															X															
	Acacia ?oswaldii																									X					
	Acacia pulchella			X																											
	Acacia shuttleworthii		X									X																			
	Acacia stenoptera			X																											
	Acacia ulicina										X																				
	Acacia sp.		X													X												X			
	Acanthocarpus canaliculatus		X											X						X					X			X			
	Actinobole uliginosum					X			X						X	X								X	X						X
	Adenanthos cygnorum																					X									
	?*Agrostocrinum* sp.			X																											
*	*Aira caryophyllea*	X	X	X						X										X	X		X		X						
	Alexgeorgea nitens			X																											
	Allocasuarina acutivalvis		X																												

APPENDIX K: VASCULAR PLANT SPECIES RECORDED IN EACH VEGETATION COMMUNITY IN THE CARAVEL COPPER PROJECT AREA

Note: * denotes an introduced species; P1 - P4 denotes prioirity taxon (DBCA 2017a, WAH 1998-).

	SPECIES	A01	A02	B01	B02	C01	C02	C03	Ca01	E01	E02	E03	E04	E05	Ed01	Ed02	Ed03	L01	M01	Rb01	S01	S02	S03	S04	S05	S06	S07	S08	S09	Sw01	T01
	Allocasuarina campestris	X	X								X					X					X	X	X								
	Allocasuarina huegeliana		X															X													
	Allocasuarina humilis			X																											
	Allocasuarina microstachya		X																												
	Alyogyne hakeifolia												X																		
	Amphipogon caricinus																						X								
	Amphipogon turbinatus			X																											
	Angianthus tomentosus												X																		
	Anigozanthos humilis subsp. *humilis*			X																											
	Aotus gracillima																						X								
	Apium annuum																														X
	Apium ?annuum																							X							
	Apium ?prostratum																								X						X
*	*Arctotheca calendula*		X					X	X	X				X	X	X				X		X		X	X	X			X		X
	Aristida contorta		X																					X	X						X
	Aristida holathera																				X										
	Aristida sp.		X																												
	Arthropodium curvipes		X																												
	Asteraceae sp.	X																X													
	Atriplex codonocarpa																														X
	Atriplex lindleyi subsp. *inflata*																			X											X
	Atriplex semibaccata												X																		
	Atriplex sp.								X				X		X																X
	Austrostipa elegantissima	X	X	X							X	X	X				X	X					X	X				X	X		X
	Austrostipa exilis									X																					
	Austrostipa hemipogon		X								X	X	X			X									X						
	Austrostipa macalpinei									X												X									
	Austrostipa ?macalpinei			X																	X										
	Austrostipa nitida													X						X											
	Austrostipa scabra subsp. *scabra*		X								X	X																			
	Austrostipa variabilis									X											X										
	Austrostipa sp.		X			X																			X						X
*	*Avena barbata*		X								X	X																X			
*	*Avena fatua*		X					X		X			X	X	X					X				X	X	X			X		

APPENDIX K: VASCULAR PLANT SPECIES RECORDED IN EACH VEGETATION COMMUNITY IN THE CARAVEL COPPER PROJECT AREA

Note: * denotes an introduced species; P1 - P4 denotes prioirity taxon (DBCA 2017a, WAH 1998-).

	SPECIES	A01	A02	B01	B02	C01	C02	C03	Ca01	E01	E02	E03	E04	E05	Ed01	Ed02	Ed03	L01	M01	Rb01	S01	S02	S03	S04	S05	S06	S07	S08	S09	Sw01	T01
	Banksia armata var. *armata*		X																							X					
	Banksia attenuata			X																											
	Banksia dallanneyi																				X										
	Banksia fraseri	X																				X									
	Banksia hewardiana		X									X																			
	Banksia menziesii			X																											
	Banksia prionotes			X	X																										
	Banksia sclerophylla																					X									
	Banksia serratuloides subsp. *serratuloides* (T)																					X									
*	*Bellardia trixago*		X																												
	Blennospora drummondii	X	X			X															X	X									
	Borya sphaerocephala	X	X			X																X	X								
	Bossiaea eriocarpa			X																											
	Bossiaea spinescens																									X					
*	*Brachypodium distachyon*									X																					
	Brachyscome bellidioides	X	X	X					X																X						X
	Brachyscome iberidifolia													X																	X
	Brachyscome perpusilla					X																									
	Brachyscome pusilla		X								X							X													
	Brachyscome sp.																														X
*	*Brassica ×napus*										X	X							X												
*	*Brassica tournefortii*		X										X	X	X																
*	*Brassica* sp.									X					X																
*	*Briza maxima*	X	X	X						X										X	X										
*	*Briza minor*									X																					
*	*Bromus diandrus*						X																								
*	*Bromus hordeaceus*						X			X																					
*	*Bromus rubens*									X			X		X				X						X						
*	*Bromus* sp.														X																
	Brunonia australis		X															X													
	Bulbine semibarbata																														X
	Burchardia congesta																					X									
	Caesia micrantha									X													X								
	Caladenia denticulata					X																									

APPENDIX K: VASCULAR PLANT SPECIES RECORDED IN EACH VEGETATION COMMUNITY IN THE CARAVEL COPPER PROJECT AREA

Note: * denotes an introduced species; P1 - P4 denotes prioirity taxon (DBCA 2017a, WAH 1998-).

SPECIES	A01	A02	B01	B02	C01	C02	C03	Ca01	E01	E02	E03	E04	E05	Ed01	Ed02	Ed03	L01	M01	Rb01	S01	S02	S03	S04	S05	S06	S07	S08	S09	Sw01	T01
Caladenia flava		X																												
Caladenia sp.	X		X																		X									
Calandrinia calyptrata													X	X												X		X		X
Calandrinia corrigioloides									X																					
Calandrinia eremaea		X						X						X									X	X						
Calandrinia granulifera								X															X	X						X
Calandrinia ?granulifera																							X							
Calandrinia sp.															X															
?*Calandrinia* sp.										X	X	X																		
Calectasia narragara			X																											
Callitris arenaria								X																						
Callitris roei																									X					
Calothamnus pachystachyus (P4)																					X									
Calothamnus quadrifidus subsp. *quadrifidus*														X						X										
Calytrix depressa		X																			X									
Calytrix flavescens			X																											
Calytrix leschenaultii					X																X	X								
Calytrix sapphirina																					X									
* *Carpobrotus* sp.													X													X		X		
Cassytha melantha												X																		
Cassytha sp.			X																	X	X	X	X							
Casuarina obesa					X	X	X								X		X													X
Caustis dioica																				X										
* *Centaurea melitensis*															X															
* *Centaurium erythraea*									X																					
Centrolepis aristata																														X
Centrolepis pilosa		X	X						X															X						
Chaetospora curvifolia			X																											
Chamaescilla corymbosa					X																									
Chamelaucium sp. Wongan Hills (B.H. Smith 1140) (P3)									X																		X			
Cheilanthes austrotenuifolia		X							X																					
Chenopodiaceae sp.																X										X				
Chordifex sinuosus			X																											
?*Chordifex sinuosus*																											X			

APPENDIX K: VASCULAR PLANT SPECIES RECORDED IN EACH VEGETATION COMMUNITY IN THE CARAVEL COPPER PROJECT AREA

Note: * denotes an introduced species; P1 - P4 denotes prioirity taxon (DBCA 2017a, WAH 1998-).

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	Comesperma integerrimum																					X								X	
	Comesperma scoparium																									X					
	Comesperma volubile				X									X							X		X						X		
	Comesperma sp.																								X						
	Conospermum stoechadis subsp. *stoechadis*			X																											
	Conostylis ?hiemalis									X																					
	Conostylis aculeata subsp. *aculeata*			X																											
	Conostylis aculeata subsp. *bromelioides*																											X			
	Conostylis androstemma																					X									
	Conostylis crassinerva subsp. *absens*	X																													
	Conostylis prolifera									X																					
	Conostylis setigera																					X									
	Conostylis teretifolia subsp. *teretifolia*			X																											
	Corynotheca sp.			X																											
*	*Cotula bipinnata*														X	X				X				X							X
*	*Cotula coronopifolia*									X										X									X		X
	Cotula cotuloides																														X
	Crassula colorata											X																			
	Crassula colorata var. *acuminata*														X																
	Crassula colorata var. *colorata*			X																											
	Crassula exserta							X						X													X		X		
	Crassula sp.		X						X			X			X									X	X					X
	Cryptandra nutans																					X									
	Cyanothamnus coerulescens subsp. *spicatus*																									X					
	Cymbopogon obtectus		X																												
*	*Cynodon dactylon*																			X											
	Dampiera lavandulacea	X	X			X										X						X			X	X					
	Dampiera ?lavandulacea		X									X																			
	Dampiera spicigera																				X										
	Daviesia ?divaricata																						X								
	Daviesia angulata																					X									
	Daviesia hakeoides subsp. *hakeoides*										X															X					
	Desmocladus asper	X								X														X	X						
	Desmocladus lateriticus											X																			

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Desmocladus parthenicus			X																											
Desmocladus sp.										X																				
Dianella revoluta		X		X	X						X	X	X	X						X	X		X	X	X			X	X
Dichopogon capillipes																						X								
Didymanthus roei								X																						X
Diplolaena velutina		X																												
Diuris picta					X																									
Dodonaea adenophora																						X								
Dodonaea divaricata																						X								
Dodonaea pinifolia					X																									
Dodonaea bursariifolia		X									X																			
Dodonaea pinifolia		X																												
Dodonaea viscosa subsp. *angustissima*		X																												
Dodonaea sp. (juvenile)																						X								
Drosera humilis			X																											
Drosera leucoblasta																						X								
Drosera menziesii			X																				X							
Drosera miniata	X				X				X					X										X						
Drosera spilos			X																		X	X								
Drosera subhirtella	X				X																X	X								
Drosera sp.	X																											X		
Drosera sp. (Climbing)			X																											
Drosera sp. (prostrate)	X																			X										
Ecdeiocolea monostachya		X			X																									
* *Ehrharta calycina*			X	X			X							X	X								X	X						
* *Ehrharta longiflora*									X					X					X									X		
* *Ehrharta* sp.																													X	
Elythranthera brunonis	X																													
Enchylaena lanata		X								X	X	X		X	X	X										X	X	X		X
Enteropogon ramosus		X																												
Eragrostis dielsii								X					X											X				X		X
Eragrostis sp.										X							X											X		
Eremaea beaufortioides			X																	X										
Eremophila drummondii												X																		

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	Eremophila lehmanniana															X														
	Eriachne ovata		X																											
	Ericomyrtus serpyllifolia		X			X						X										X	X			X				
	Erigeron sp.																												X	
*	*Erodium botrys*		X							X					X										X			X		
	Erymophyllum ramosum subsp. *ramosum*												X																	
	Eucalyptus arachnaea subsp. *arachnaea*										X																			
	Eucalyptus arachnaea subsp. *arrecta* (P3)		X																											
	Eucalyptus armillata												X						X											
	Eucalyptus capillosa														X															
	Eucalyptus celastroides subsp. *virella*																X													
	Eucalyptus ebbanoensis subsp. *ebbanoensis*																									X				
	Eucalyptus horistes		X											X																
	Eucalyptus leucoxylon															X														
	Eucalyptus ?litorea (Planted)														X															
	Eucalyptus loxophleba		X										X			X										X				
	Eucalyptus loxophleba subsp. *loxophleba*		X								X					X														X
	Eucalyptus loxophleba subsp. *supralaevis*		X								X		X																	
	Eucalyptus ?loxophleba subsp. *supralaevis*										X																			X
	Eucalyptus orthostemon																													X
	Eucalyptus pileata												X																	
	Eucalyptus rigidula												X																	
	Eucalyptus rudis subsp. *rudis*																			X										
	Eucalyptus salmonophloia			X									X			X														
	Eucalyptus ?salmonophloia		X																											
	Eucalyptus todtiana			X																										
	Eucalyptus virella		X																X											
	Eucalyptus wandoo		X								X	X				X														
	Eucalyptus wandoo subsp. *wandoo*	X	X							X	X	X																		
	Eucalyptus ?yilgarnensis															X														
	Eucalytpus sp. 1														X															
	Eucalytpus sp. 2														X															
	Eucalytpus sp. 3										X																			
	Eucalytpus sp. 4														X															

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	Eucalyptus sp. 5											X																			
	Eucalyptus sp. 6														X																
	Eucalyptus sp. 7																													X	
	Eucalyptus sp. 8																					X									
	Eucalyptus sp. 9							X																							
	Frankenia sp.																														X
	Gastrolobium callistachys		X																												
	Gastrolobium trilobum																						X								
	Gastrolobium calycinum																									X					
*	*Gladiolus caryophyllaceus*			X																		X									
	Glischrocaryon aureum		X																			X	X			X					
	Glischrocaryon flavescens		X																												
	Gnephosis angianthoides																														X
	Gnephosis drummondii																														X
	Gnephosis tenuissima							X										X			X										
	Gnephosis tridens																														X
	Gompholobium marginatum																						X								
	Gompholobium tomentosum			X																											
	Gonocarpus nodulosus									X																					
	Goodenia berardiana		X							X													X								X
	Goodenia coerulea																					X									
	Goodenia cycnopotamica		X			X																	X								
	Goodenia drummondii subsp. *drummondii*																						X								
	Goodenia micrantha	X																					X								
	Goodenia reinwardtii			X																											
	Goodenia sp.														X																
	Grevillea ?*eriostachya*																									X					
	Grevillea hakeoides subsp. *hakeoides*																											X			
	Grevillea hookeriana subsp. *hookeriana*							X																	X						
	Grevillea levis		X			X		X																		X		X			
	Grevillea petrophiloides															X										X					
	Grevillea petrophiloides subsp. *petrophiloides*		X																												
	Grevillea scabra																									X					
	Guichenotia micrantha		X									X																			

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	Haemodorum discolor									X																					
	Haemodorum laxum																					X									
	Haemodorum spicatum			X																		X	X								
	Haemodorum sp.		X																												
	Hakea ?circumalata								X																						X
	Hakea ?commutata															X															
	Hakea ?erinacea															X							X								
	Hakea gilbertii																					X									
	Hakea incrassata	X																				X									
	Hakea preissii						X							X																	X
	Hakea sp.																									X		X			
	Hakea meisneriana																									X					
	Helichrysum leucopsideum											X																			
	Helichrysum ?leucopsideum							X																							
	Hemigenia diplanthera																						X								
	Hibbertia acerosa																					X									
	Hibbertia ?exasperata		X									X																			
	Hibbertia rupicola		X																												
	Hibbertia striata			X																											
	Hibbertia subvaginata																					X									
	Hibbertia sp.			X																											
*	*Hordeum leporinum*						X	X		X										X									X		X
*	*Hordeum* sp.																			X											
	Hyalochlamys globifera																														X
	Hyalosperma cotula	X																				X									
	Hyalosperma demissum		X			X																	X	X							
	Hyalosperma glutinosum subsp. *glutinosum*		X																						X						
	Hydrocotyle callicarpa	X																					X								
	Hydrocotyle intertexta		X																												
	Hypocalymma angustifolium		X																												
	Hypocalymma suave																									X					
*	*Hypochaeris glabra*	X	X	X	X			X		X				X	X					X	X			X	X	X	X		X		X
*	*Hypochaeris radicata*			X						X																					
	Isolepis cernua						X								X																

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	Isolepis marginata								X																						X
	Isopogon dubius																					X									
	Isotropis cuneifolia subsp. *cuneifolia*			X																											
	Isotropis juncea																								X						
	Jacksonia angulata																						X								
	Jacksonia fasciculata																							X						X	
	Jacksonia floribunda																							X							
	Jacksonia nutans			X																											
	Jacksonia sp.		X																												
*	*Juncus acutus*						X	X										X												X	X
	Labichea lanceolata																				X										
	Lawrencella rosea	X																					X								
	Laxmannia ramosa			X																	X										
	Laxmannia sessiliflora subsp. *drummondii*																					X									
*	*Leontodon rhagadioloides*									X																					
	Lepidobolus preissianus	X		X																	X										
	Lepidobolus preissianus subsp. *preissianus*		X																			X									
	Lepidosperma asperatum					X												X						X							
	Lepidosperma costale sens lat.		X																												
	Lepidosperma longitudinale sens. lat.		X																												
	Lepidosperma ?tenue sens. lat.		X																												
	Lepidosperma sp.	X	X	X														X					X								
	Leptospermum erubescens		X																		X										
	Leptospermum oligandrum																				X										
	Leptospermum roei																									X					
	Leschenaultia floribunda		X																												
	Levenhookia pusilla																					X									
	Levenhookia stipitata	X		X																	X	X	X								X
	Lobelia heterophylla		X																												
	Lobelia ?rhytidosperma							X																							
	?*Lobelia* sp.	X																				X									
*	*Lolium perenne*												X																		
*	*Lolium rigidum*						X								X	X				X						X			X		X
	Lomandra caespitosa			X																											

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Lomandra collina																											X			
Lomandra sp.																								X						
* *Lupinus angustifolius*									X																					
* *Lupinus cosentinii*		X																												
Lyginia imberbis			X																											
* *Lysimachia arvensis*	X		X						X					X					X	X										X
Machaerina articulata																	X													
Machaerina juncea																	X													
Macrozamia fraseri									X																					
Maireana brevifolia		X								X	X	X						X												
Maireana carnosa												X																		
Maireana enchylaenoides										X																				
Maireana sp.							X							X	X															
Malvaceae sp.																									X					
* *Medicago polymorpha*														X	X				X											
* *Medicago truncatula*									X																					
Melaleuca ?acuminata																											X			
Melaleuca acuminata subsp. *acuminata*																						X								
Melaleuca adnata										X		X															X	X		
Melaleuca calyptroides																					X									
Melaleuca concreta		X																				X								X
Melaleuca cuticularis																														X
Melaleuca hamulosa										X														X		X	X			X
Melaleuca halmaturorum																								X						
Melaleuca ?halmaturorum								X																						
Melaleuca lateriflora																								X				X		X
Melaleuca laxiflora										X																	X			
Melaleuca marginata										X		X										X								
Melaleuca radula	X																					X								
Melaleuca rhaphiophylla																			X											
Melaleuca scalena													X				X							X		X				
Melaleuca seriata			X																	X										
Melaleuca viminea subsp. *viminea*							X										X		X										X	
Melaleuca ?vinnula																											X			

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Melaleuca sp.								X																	X		X			
* *Mesembryanthemum nodiflorum*								X		X	X	X		X		X	X							X			X			X
Mesomelaena pseudostygia			X																		X									
Mirbelia ramulosa					X																			X						
Mirbelia trichocalyx																									X					
* *Monoculus monstrosus*													X	X									X	X				X		X
* *Moraea flaccida*															X															
* *Moraea setifolia*																			X											
Morelotia octandra																				X										
Muehlenbeckia adpressa																							X		X				X	
Neurachne alopecuroidea	X	X	X		X			X	X	X	X				X					X	X	X								
Nuytsia floribunda			X																											
Olearia sp. eremicola (Diels & Pritzel s.n. PERTH 00449628)					X																									
Opercularia vaginata		X	X		X					X	X										X			X	X					
Ophioglossum lusitanicum																								X						
* *Orobanche minor*									X																					
Orthrosanthus laxus																					X									
* *Oxalis corniculata*														X																
* *Oxalis pes-caprae*									X										X											
Panaetia lessonii		X			X				X																X					
* *Parapholis incurva*									X																					X
* *Parentucellia latifolia*									X																					
* *Pentameris airoides*	X	X							X	X	X	X	X	X								X						X		
Pericalymma ellipticum																							X							
Petrophile brevifolia																				X	X									
Petrophile linearis			X																											
Petrophile macrostachya		X	X																											
Petrophile plumosa (P3)																					X									
Petrophile ?shuttleworthiana																									X					
* *Petrorhagia dubia*									X																					
Philydrella drummondii																						X								
Phyllangium paradoxum	X		X																											
Phyllangium ?sulcatum																						X								
Phyllanthus calycinus		X																												

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	Pimelea sp.	X																				X									
	Pimelea villifera		X																				X								
	Plantago debilis																						X						X		
	Platysace maxwellii																						X								
*	*Poaceae* sp.		X								X	X	X				X	X													X
*	*Poaceae* sp. 1		X																												X
*	*Poaceae* sp. 2		X																												X
	Podolepis aristata subsp. *aristata*		X																						X						
	Podotheca angustifolia		X	X						X											X	X		X	X		X		X		
	Podotheca gnaphalioides	X	X	X						X	X				X						X	X		X	X			X			
	Podotheca sp.													X																	
	Pogonolepis muelleriana														X																X
	Pogonolepis stricta																								X			X	X		X
	Poranthera microphylla			X						X												X									
	Pterochaeta paniculata																					X									
	Pterostylis sp.	X																													
	Ptilotus declinatus										X																	X			
	Ptilotus halophilus															X															
	Ptilotus holosericeus												X																		
	Ptilotus humilis									X																					
	Ptilotus manglesii	X									X											X									
	Ptilotus polystachyus		X	X						X	X			X	X					X	X					X					
	Ptilotus spathulatus													X																	
	Ptilotus sp.											X																			
	Quinetia urvillei								X																X						X
*	*Raphanus raphanistrum*										X					X															
	Rhagodia drummondii				X		X	X				X	X	X													X		X		X
	Rhagodia preissii subsp. *preissii*		X			X			X				X		X	X								X	X		X		X	X	X
	Rhagodia sp. Watheroo (R.J. Cranfield & P.J. Spencer 8183)										X																	X			
	Rhodanthe chlorocephala subsp. *rosea*									X																					
	Rhodanthe laevis																						X								
	Rhodanthe manglesii		X																												
*	*Romulea rosea*						X	X		X					X					X			X			X					X
	Rytidosperma acerosum									X																					

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Rytidosperma caespitosum		X								X		X																		
Rytidosperma setaceum			X												X															
Salsola australis																														
Santalum acuminatum		X									X														X				
Santalum murrayanum										X																	X			
Santalum ?spicatum		X						X																						
Santalum sp.													X																	
Scaevola ? spinescens															X															
Schoenus brevisetis			X																		X									
Schoenus clandestinus			X		X																									
Schoenus nanus	X																					X								
Schoenus ?nanus																						X								
Schoenus ?sp. smooth culms (K.R. Newbey 7823)																					X									
Scholtzia drummondii				X																										
Scholtzia laxiflora			X																											
Sclerolaena diacantha												X																		
Sclerolaena eurotioides																														X
Senecio lacustrinus																												X		X
Senecio pinnatifolius var. *pinnatifolius*								X																X						X
Seringia velutina															X										X					
Siemssenia capillaris		X						X					X	X									X	X			X	X		X
* *Silene gallica*									X																					
* *Silene gallica* var. *gallica*									X																					
* *Solanum nigrum*									X																					
* *Sonchus oleraceus*				X		X	X					X		X				X	X					X				X		X
Sowerbaea laxiflora									X													X								
Spartochloa scirpoidea		X																												
Spergularia marina																			X											X
* *Spergula pentandra*									X																					
* *Spergularia rubra*														X					X									X		X
Sphaerolobium medium																					X									
Stenanthemum pomaderroides		X									X											X			X					
Stenopetalum sphaerocarpum								X																						
Stirlingia latifolia			X																											

APPENDIX K: VASCULAR PLANT SPECIES RECORDED IN EACH VEGETATION COMMUNITY IN THE CARAVEL COPPER PROJECT AREA

Note: * denotes an introduced species; P1 - P4 denotes prioirity taxon (DBCA 2017a, WAH 1998-).

SPECIES	A01	A02	B01	B02	C01	C02	C03	Ca01	E01	E02	E03	E04	E05	Ed01	Ed02	Ed03	L01	M01	Rb01	S01	S02	S03	S04	S05	S06	S07	S08	S09	Sw01	T01
Stylidium adpressum			X																											
Stylidium neglectum		X																				X								
Stylidium piliferum			X																											
Stylidium purpureum			X																		X									
Stylidium repens			X																		X									
Stylidium sp.	X																				X									X
Stylidium sp. Moora (J.A. Wege 713) (P2)	X																				X									
Stylobasium australe										X																				
Stypandra glauca	X	X							X								X					X								
Styphelia ?conostephioides			X																											
Styphelia ?macrocalyx			X																											
Styphelia pallida																									X					
Styphelia serratifolia					X																X	X								
Synaphea ?acutiloba																					X									
Synaphea spinulosa subsp. *spinulosa*			X																											
Tecticornia indica subsp. *bidens*																												X		X
Tecticornia lepidosperma								X											X					X				X		X
Tecticornia pergranulata subsp. *pergranulata*																														X
Tecticornia sp. 1																			X											X
Tecticornia sp. 2																			X											
Tecticornia sp. 3																														X
Templetonia sulcata												X																		
Thryptomene cuspidata		X																												
Thryptomene mucronulata																										X			X	X
Thryptomene racemulosa																									X					
Thysanotus dichotomus		X								X	X																X			
Thysanotus manglesianus	X																				X									
Thysanotus patersonii		X	X										X							X				X	X					
Thysanotus ?triandrus																				X										
Thysanotus sp.	X																							X						
Thysanotus sp. (climbing)			X																											
Trachymene cyanopetala		X			X			X									X					X								
Trachymene ornata	X	X																			X	X								
Trachymene ?ornata																						X								

APPENDIX K: VASCULAR PLANT SPECIES RECORDED IN EACH VEGETATION COMMUNITY IN THE CARAVEL COPPER PROJECT AREA

Note: * denotes an introduced species; P1 - P4 denotes prioirity taxon (DBCA 2017a, WAH 1998-).

	SPECIES	A01	A02	B01	B02	C01	C02	C03	Ca01	E01	E02	E03	E04	E05	Ed01	Ed02	Ed03	L01	M01	Rb01	S01	S02	S03	S04	S05	S06	S07	S08	S09	Sw01	T01
	Trachymene pilosa	X	X	X						X											X	X									X
	Tricoryne tenella		X																												
	?*Tricoryne* sp.		X								X																	X			
*	*Trifolium arvense*																												X		
*	*Trifolium glomeratum*																												X		
*	*Trifolium subterraneum*														X																
*	*Trifolium* sp.																			X											
	Triglochin calcitrapa								X																X						X
	Triglochin isingiana														X																
	Triglochin longicarpa														X																X
	Triglochin minutissima & Centrolepis humillima																	X													X
	Triglochin mucronata																								X						X
	Triglochin sp.													X															X		X
	Triodia danthonioides	X												X							X										
	Trymalium ?*daphnifolium*		X								X																				
	?*Trymalium* sp.											X																			
*	*Ursinia anthemoides*	X	X	X	X		X	X	X	X				X	X			X		X	X			X	X						X
	Utricularia violacea																														X
	Verticordia chrysanthella																					X	X								
	Verticordia densiflora var. *densiflora*																				X										
	Verticordia huegelii var. *stylosa*																						X								
*	*Vulpia muralis*		X						X					X	X	X								X	X				X		X
*	*Vulpia myuros forma myuros*	X		X						X											X								X		
*	*Wahlenbergia capensis*			X																	X										
	Wahlenbergia gracilenta							X													X										
	Wahlenbergia sp.									X																					
	Waitzia acuminata		X																												
	Waitzia acuminata var. *acuminata*		X								X	X	X					X													
	Waitzia acuminata var. *albicans*	X		X																	X										
	Waitzia nitida		X																												
	Wilsonia humilis																														X
	Xanthorrhoea brunonis			X																											
	Xanthorrhoea preissii			X																		X									
	Xanthosia sp.		X																												
*	*Zaluzianskya divaricata*					X	X								X										X						