



Detailed Flora and Vegetation Survey

**Western Power Corridor to Service Cracking and Leaching Plant
at Lot 500 Great Eastern Highway, Yilkari**

**Prepared for Lynas Kalgoorlie Pty Ltd
17th June 2021**



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EXECUTIVE SUMMARY

Lynas Kalgoorlie Pty Ltd (Lynas) commissioned Onshore Environmental Consultants (Onshore Environmental) to undertake a detailed flora and vegetation survey of a 3.2 kilometre (km) linear infrastructure corridor, herein referred to as the 'study area', that will service the Cracking and Leaching Plant constructed at Lot 500 Great Eastern Highway, Yilkari. The study area is situated to the west of Kalgoorlie in the Goldfields region of Western Australia.

A single season detailed flora and vegetation survey was completed under good seasonal conditions in May 2021. A total of 125 plant taxa from 28 families and 73 genera were recorded from the study area, with species representation greatest among the Poaceae, Chenopodiaceae, Scrophulariaceae, Fabaceae and Asteraceae families. The most speciose genera were *Eremophila*, *Eucalyptus*, *Maireana*, *Acacia* and *Sida*.

None of the plant taxa recorded from the study area were gazetted as Threatened Flora pursuant to the *Biodiversity Conservation Act 2016* (BC Act) or listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). Based on the database searches completed as part of the desktop assessment, no Threatened flora species were likely to occur within the study area.

One plant species recorded from the study area was listed as a Priority flora taxon by the Department of Biodiversity Conservation and Attractions (DBCA); *Eremophila praecox* (Priority 2). *Eremophila praecox* was recorded as two individuals from two separate locations within the study area. Plants reached a maximum height of 1.8 metres (m) and were found on sandy/stony plains. Targeted searches recorded plants at nine additional locations situated outside the study area boundary.

Twenty-one introduced species were recorded from the study area. None of these weed species were Declared Plants listed under the *Biosecurity and Agriculture Management Act 2007* (BAM Act 2007).

A total of six vegetation types were described and mapped from the study area. None of the vegetation types were aligned with any commonwealth or state listed Threatened Ecological Communities (TECs) or state listed Priority Ecological Communities (PECs) known to occur in the Goldfields region. Vegetation within the study area was determined to be well represented at all levels (state-wide, bioregional [IBRA region and IBRA sub-region] and local), with approximately 98% of the pre-European extent remaining for the sole Beard (1978) vegetation association represented within the study area. Approximately 1.6% of the current known distribution of this vegetation association (at the state level) occurs within secure (Class I-IV) reserves.

Vegetation condition was rated as *good* or *degraded* with disturbances including access tracks, roads (including a major highway), artificial drains, carparks, clearing, ground disturbance, timber cutting and rubbish.

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1.0 INTRODUCTION

1.1 Preamble

Onshore Environmental was commissioned by Lynas (on behalf of Western Power) to undertake a detailed flora and vegetation survey along a 3.2 km linear infrastructure corridor that will service the Cracking and Leaching Plant proposed for Lot 500 Great Eastern Highway, Yilkari. The total area of the corridor is approximately 11 hectares (ha).

1.2 Site Overview

The study area is located on the western outskirts of the Kalgoorlie townsite in the Goldfields region of Western Australia (Figure 1). Kalgoorlie is the main regional urban and industrial centre within the region, with surrounding land uses including grazing of rangelands (pastoral stations), crown reserves and mining. Mining occurs immediately adjacent to the larger regional centres of Kalgoorlie and Coolgardie, along with many other smaller towns in the Goldfields.

1.3 Biogeographic Regions

The latest version of the Interim Biogeographic Regionalisation for Australia (IBRA7) divides Australia into 89 bioregions based on climate, geology, landform, native vegetation and species information. These bioregions are further divided into 419 sub-regions (Department of Environment 2013). The bioregions and sub-regions are the reporting unit for assessing the status of native ecosystems and their level of protection in the National Reserve System.

The study area is within the Eastern Goldfields subregion (COO003) of the Coolgardie bioregion, and close to the southern boundary of the Murchison bioregion. The Eastern Murchison subregion (MUR01) of the Murchison bioregion occurs to the north west of the study area.

The Eastern Goldfields sub-region covers over 5.1 million hectares (CALM 2002). The sub-region comprises vegetation dominated by mallee, *Acacia* thickets and shrub heaths on sandplains, diverse *Eucalyptus* woodlands fringing salt lakes, on ranges and in valleys, while salt lakes support dwarf shrublands of samphire. Woodlands and *Dodonaea* shrubland occur on basic granulites of the Fraser Range. The subregion is rich in endemic *Acacias* (CALM 2002).

The Eastern Murchison subregion is characterised by internal drainage and extensive areas of elevated red desert sandplain with minimal dune development. Broad plains of red-brown soils and breakaway complexes occur as well as red sandplains. Vegetation is dominated by Mulga Woodlands (often rich in ephemerals), hummock grasslands, saltbush shrublands and *Halosarcia* (samphire) shrublands (Cowan 2001).

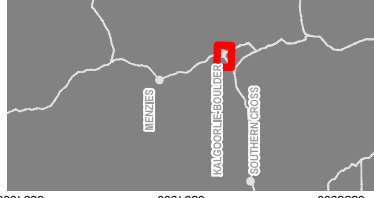
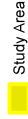


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FIGURE 1

Study Area
Location

Legend



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Projection: MGA Zone 51

Date: 14/06/2021
Scale: 1:100,000
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Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

1.4 Climate

The Kalgoorlie region has an arid to semi-arid climate. The closest weather station is at the Kalgoorlie-Boulder Airport situated 3 km east of the study area. Average annual rainfall is 265 mm with a bimodal rainfall pattern (Bureau of Meteorology (BOM) 2021). Rainfall peaks in February with another smaller peak in June. Summer rainfall originates from deteriorating tropical cyclones that cross the coast of northern Western Australia and dissipate to the south east. Winter rainfall results from cold fronts crossing the southern coastline and moving inland. Mean maximum summer temperatures reach 33 degrees with mean minimum winter temperatures of 5 degrees.

Rainfall prior to the May 2021 field survey was above average with 139.4 mm recorded in the four months prior to the field survey, compared to the long term average of 104.6 mm (Figure 1). This period included monthly falls of 95.2 mm and 32.4 mm during February and March 2021. Seasonal conditions at the time of the survey were rated as *very good*.

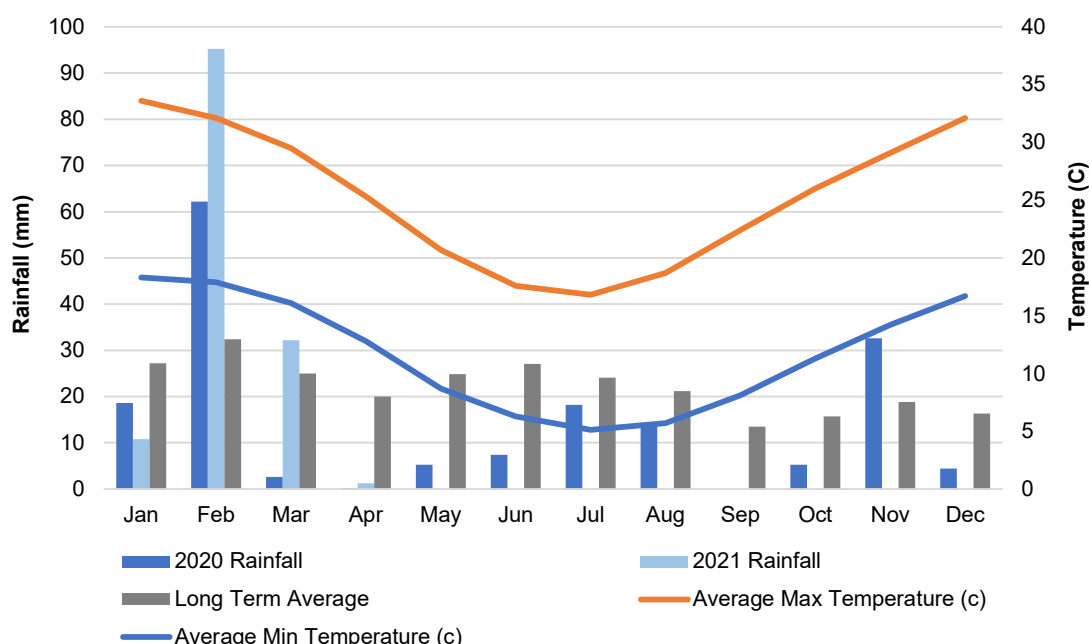


Figure 1 Rainfall data recorded at the Kalgoorlie-Boulder Airport station for 2020 and January to April 2021, with long term average rainfall and temperature data (Bureau of Meteorology 2021).

1.5 Soils

Tille (2007) classified the most recent and detailed mapping of Western Australia's rangelands and arid interior into a hierarchy of soil-landscape mapping units. The study area is located within the Kalgoorlie Province, which has been divided into six soil-landscape zones. The study area lies within the Kambalda Zone.

The Kambalda Zone comprises flat to undulating plains with hills, ranges and some salt lakes and stony plains on greenstone and granitic rocks of the Yilgarn Craton. Soils are calcareous loamy earths and red loamy earths with salt lake soils, and some red-brown hardpan shallow loams and red sandy duplexes. Vegetation is described as red mallee, blackbutt, salmon gum and gimlet woodlands, with mulga and halophytic shrublands (and some spinifex grasslands).

1.6 Landforms

The Kalgoorlie Province consists of an extensive plateau of low relief; flat to undulating plains with small valleys (occasionally broken by low narrow rocky hills, ridges, tors and bosses) most commonly found on granitic terrain. These plains support silcrete duricrust, claypans, salt lakes with dunes and lunettes, gilgai areas, small remnants of sand plain, and small dune tracts. Low breakaways with short saline footslopes are occasionally present. Below these plains are some broad, flat to undulating, shallow valley plains formed on quaternary alluvium and colluvium. These plains have little defined drainage with seasonal lakes and claypans and isolated granitic and basic rock outcrops. Slightly lower down in the landscape are broad, flat valleys with chains of salt lakes. Also present on these valley floors are saline flats, claypans, kopi dunes, sand dunes, and sometimes tors and bosses of outcropping granites.

Higher up in the landscape are gently sloping to gently undulating plateau areas on granites and gneisses. These have long gentle slopes and, in places, abrupt erosional scarps. Some granitic bosses and tors are present. Rocky ranges, hills and ridges have formed on the greenstone, along with some undulating to low hilly country. Associated with this hilly terrain are gently undulating stony plains and low rises on limonite. Level to gently undulating sandplains and gravelly sandplains are mostly found over lateritic residuals and granitic basement. There are also some extensive loamy plains with sandy surfaces.

The study area is topographically flat, set on predominantly orange and yellow sands with the dominant landform being hardpan plain. The study area is situated on road verges and is dissected by tracks, artificial drains and parking areas, particularly in the north eastern sector which closer to Kalgoorlie.

1.7 Land Systems

The Department of Agriculture (now the Department of Primary Industries and Regional Development [DPIRD]) has conducted 14 rangeland surveys since 1972. These inventory and condition surveys used an integrated survey method involving the land system approach to rangeland description and evaluation. The primary objective of the surveys was to provide comprehensive descriptions and mapping of the biophysical resources of the region, as well as an evaluation of the condition of soils and vegetation. The mapping was based on patterns in topography, soils and vegetation.

Two rangeland surveys have been completed in the vicinity of the study area. The land systems of the Kambalda area were described by Payne *et al* (1998) and a survey of the north-eastern Goldfields was undertaken by Pringle *et al* (1994). The mapping from these two surveys covers areas to the east and south of the study area, with no land system maps available for the immediate study area. A total of six land systems occur within a 20 km radius of the study area (Table 1). The Gumland Land System is the most representative on the basis

of landforms and vegetation occurring within the study area, and is described as 'extensive pedepains supporting eucalypt woodlands with halophytic and non-halophytic shrub understoreys' (Payne *et al* 1998). Additional land systems occurring in the general area include basalt and greenstone rises, low hills, stony plains, and saline or seasonally inundated lakes (Table 1).

Table 1 Land systems occurring within a 20km radius of the study area.

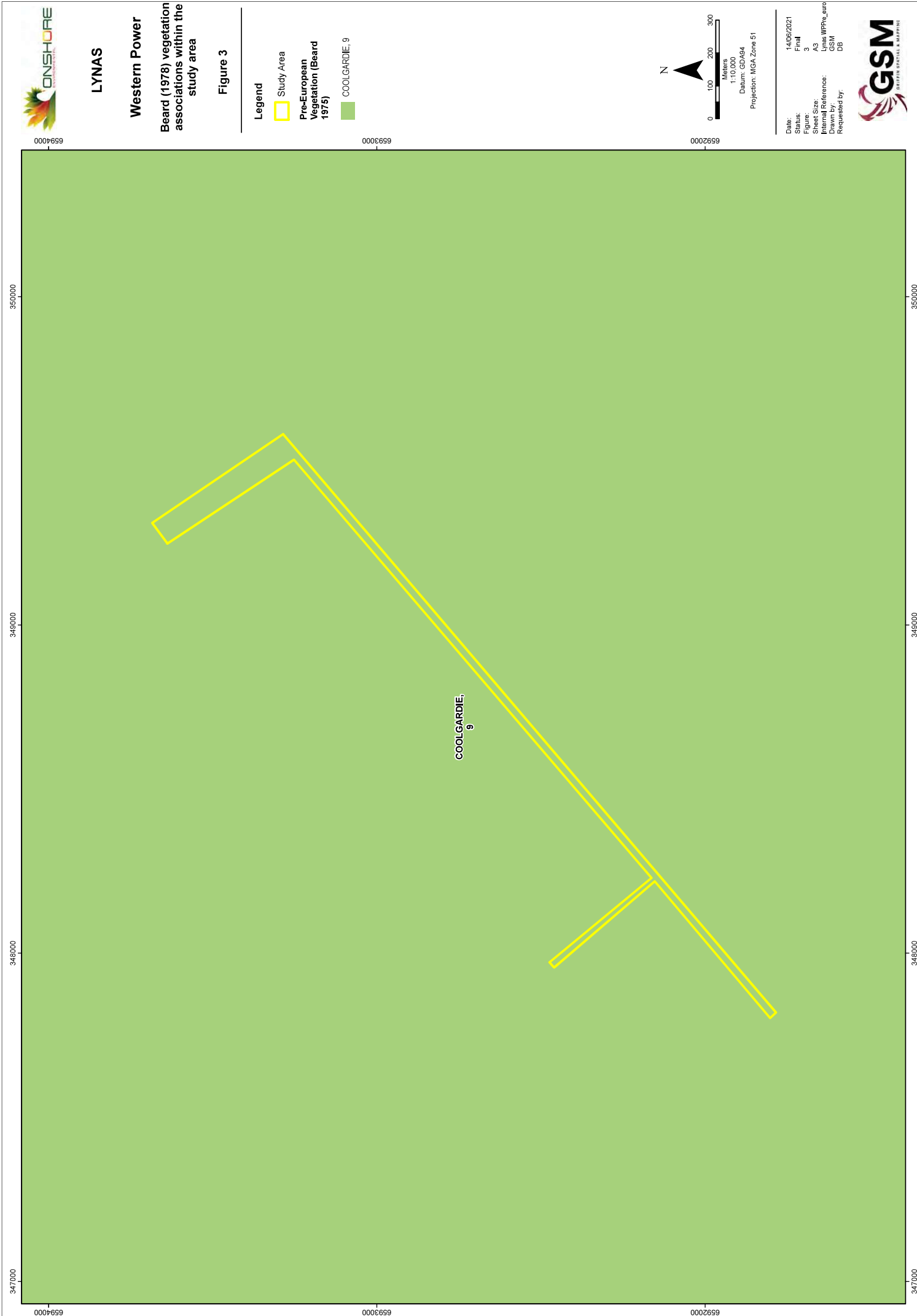
Land System	Description
Gumland	Extensive pedepains supporting eucalypt woodlands with halophytic and non-halophytic shrub understoreys.
Graves	Basalt and greenstone rises and low hills supporting eucalypt woodlands with prominent saltbush and bluebush understoreys.
Moriarty	Low greenstone rises and stony plains supporting chenopod shrublands with patchy eucalypt overstoreys.
Zed	Low hills, rises and gently undulating stony plains based on metasedimentary rocks supporting acacia shrublands.
Lake Bed	Bare lake beds inundated for short periods after rain.
Lefroy	Salt lakes and fringing saline plains, sandy plains and dunes with halophytic shrublands.

1.8 Flora and Vegetation

The study area is located on the border of the Coolgardie and Murchison IBRA regions of the South-west Interzone and Eremaean Botanical Provinces (Beard 1990). Beard (1978) described and mapped vegetation of the Kalgoorlie area at a scale of 1:250,000 differentiating eight vegetation systems. The original vegetation mapping undertaken by Beard (1978) was later refined by Shepherd *et al.* (2002), with one vegetation association represented within the study area (Figure 3). The Pre-European extent currently remaining for the vegetation association represented within the study area is 97.8%, with 1.6% of the current distribution occurring within secure Class I-IV reserves (Table 2).

Table 2 Pre-European extent of vegetation associations occurring within the study area (Shepherd *et al.* 2002).

Vegetation Association	System	Description	Pre-European Extent (ha)	% Remaining	% Current Extent in Class I-IV Reserves
9	Coolgardie	Medium woodland; coral gum (<i>Eucalyptus torquata</i>) & goldfields blackbutt (<i>E. leuocarpa</i>)	240,509.33	97.78	1.56



2.0 METHODOLOGY

2.1 Legislation and Guidance Statements

The detailed flora and vegetation survey was carried out in a manner that was compliant with Environmental Protection Authority (EPA) requirements for the environmental surveying and reporting of flora and vegetation in Western Australia:

- Technical Guidance Flora and Vegetation Surveys for Environmental Impact Assessment (EPA 2016a);
- Environmental Factor Guideline: Flora and Vegetation (EPA 2016b); and
- Statement of Environmental Principles, Factors and Objectives (EPA 2020).

2.2 Desktop Assessment

2.2.1 Literature Review

Regional scale reports relevant to the study area locality were reviewed, including:

- a summary of bioregional data (Cowen 2001);
- land systems mapping (Pringle *et al* 1994, Curry *et al* 1994, Payne *et al* 1998); and
- vegetation description and mapping by Beard (1976).

In addition, there was a review of all publicly available literature. While no previous flora and vegetation surveys have been completed within the study area, a number of previous surveys associated with mining projects have been undertaken within the wider Kalgoorlie area.

2.2.2 Database Searches

Desktop searches included information relating to significant flora, TECs, and PECs previously collected or described within, or in close proximity to, the study area. For this report the search was extended beyond the study area to place flora values into a local and regional context. The following databases were searched:

- NatureMap: This database represents the most comprehensive source of information on the distribution of Western Australia's flora, comprising records from the DBCA database and the Western Australian (WA) Herbarium Specimen Database (40 km radial search) (DBCA 2021a);
- DBCA's Threatened and Priority flora database was searched to confirm the NatureMap results (50 km radial search; May 2020) (DBCA 2020a);
- DBCA's TEC, PEC and Environmentally Sensitive Areas (ESAs) database was searched to identify significant communities (100 km radial search; May 2020) (DBCA 2020b);
- EPBC Act Protected Matters Database (50 km radial search) (DAWE 2021a); and
- International Union for Conservation of Nature (IUCN) database (IUCN 2021).

2.2.3 Assessment of Likelihood of Occurrence in the Study Area

A list of conservation significant species occurring within a 50 km radius of the study area was compiled during the desktop searches. The likelihood of each taxon occurring within the study area was assessed using a set of rankings and criteria based on presence of suitable landform (inferred from aerial imagery with contours overlaid and knowledge of the adjacent areas) and distance to known records (Table 3).

Table 3 Ranking system used to assign the likelihood that a species would occur in the study area.

Rank	Criteria
Recorded	The species has been recorded in the study area.
Likely to occur	The species has previously been recorded from a landform which is present within the study area, and there are previous records within a 20 km radius of the study area.
Possible to occur	The species has previously been recorded from a landform which is present within the study area, and there are previous records within a 50 km radius of the study area.
Unlikely to occur	The landform from which the species has previously been recorded is absent within the study area, and/or there are no previous records within a 50 km radius of the study area.

2.2.4 Assessment of Conservation Significance

The conservation significance of flora and ecological communities are classified at a Commonwealth, State and Local level on the basis of various Acts and Agreements, including: International Level:

- IUCN: The IUCN 'Red List' lists species at risk under nine categories (status codes) (Appendix 1).

Commonwealth Level:

- EPBC Act: The Department of Agriculture, Water and the Environment (DAWE) lists Threatened flora and ecological communities, which are determined by the Threatened Species Scientific Committee according to criteria set out in the Act. The Act lists flora that are considered to be of conservation significance under one of six categories (Appendix 1).

State Level:

- BC Act: At a State level, native flora species are protected under the BC Act - Wildlife Conservation Notice. A number of species are assigned an additional level of conservation significance based on a limited number of known populations and the perceived threats to these locations (Appendix 1); and
- DBCA Priority list: DBCA produces a list of Priority species and ecological communities that have not been assigned statutory protection under the BC Act. Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added under Priorities 1, 2 or 3. Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been removed from the threatened species list for other taxonomic reasons, are placed in Priority 4. These species require regular monitoring (see Appendix 1). The list of PECs identifies those that need further investigation before nomination for TEC status at a State level.

Local Level:

- Species may be considered of local conservation significance because of their patterns of distribution and abundance. Although not formally protected by legislation, such species are acknowledged to be in decline as a result of threatening processes, primarily habitat loss through land clearing.

2.3 Survey Methodology

2.3.1 Timing and Personnel

The flora and vegetation survey was completed by Principal Botanist Dr Jerome Bull between the 7th and 9th of May 2021.

2.3.2 Sampling of Study Sites

The field survey involved systematic sampling using quadrats (referred to as study sites). Relevé vegetation descriptions were made to increase the accuracy of vegetation mapping and targeted searches were completed in habitats where it was anticipated that significant flora might occur. The study sites were 20 m by 20 m in dimension which is standard for the Coolgardie and Murchison bioregions. A total of 18 quadrats were formally assessed. The locations of all quadrats are provided in Figure 4.

The sampling sites were assessed to provide a list of the total flora occurring within the study area and a description of the vegetation structure. Data collected covered a range of environmental parameters including:

- Landform and habitat;
- Aspect;
- Soil colour and soil type;
- Rock type;
- Slope (angle);
- Vegetation condition;
- Disturbance (caused by fire, clearing, grazing etc.);
- Age since fire;
- Broad floristic formation;
- Vegetation type description; and
- Height and percentage ground cover provided by individual plant taxa.

Other parameters recorded for each study site were:

- Study site number and date of assessment;
- Names of the botanists undertaking the assessment;
- Location description - a waypoint and GPS coordinate (GDA94) using a handheld GPS; and
- Photograph number.

Vegetation condition for each of the study sites was determined using a recognised rating scale (based on Keighery 1994, see Appendix 2).



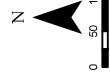
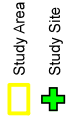
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Western Power

Location of Study Sites

Figure 4

Legend



Datum: GDA94
1:7,500
Projection: MGA Zone 51

Date: 15/04/2021
Scale: 1:7,500
Figure: 4
Sheet Size: A3
Internal Reference: Lynas_SS
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2.3.3 Targeted Surveys for Conservation Significant Species

Targeted searches for flora species of conservation significance were completed within the study area and immediate surrounds. Ground truthing provided an opportunity to record opportunistic locations for Threatened and Priority listed flora, and undertake closer examination of specific landforms where conservation significant flora may be expected to occur.

2.3.4 Weed Survey

Introduced flora species were recorded from the formal study sites assessed within the study area. Opportunistic collections were also made while moving throughout the study area, with targeted weed searches completed in any high moisture habitats or highly disturbed areas encountered.

2.3.5 Floristic Analysis

A multivariate statistical analysis of the floristic quadrat data (18 quadrats) was completed to assist in understanding the vegetation-habitat relationships within the study area. Statistical analysis of quadrat data can support delineation of vegetation types within the study area, and provide comparison against locally significant communities (TECs and PECs) where quadrat data is available.

A two-way classification (Agglomerative Hierarchical Fusion) of the presence/absence quadrat data was carried out on the 112 taxa x 18 quadrat dataset using the program PATN (Belbin 2003). The flexible unweighted pair group method with arithmetic mean (UPGMA) classification strategy was used ($\beta = -0.1$), together with the Bray-Curtis site similarity measure. The number of groups to be determined was set at seven. The primary output of the classification was in the form of a dendrogram (Appendix 3).

The results from the statistical analysis need to be appropriately analysed by an experienced botanist, and effects such as fire disturbance, ephemeral taxa, and spatial distribution of quadrats taken into consideration when interpreting the results. Plant taxa that occupy a range of vegetation types can obscure vegetation patterning and influence statistical outputs. It must be acknowledged that the results of multivariate statistical analysis may not always align with the delineated vegetation types; in these instances, an explanation for the differences will be provided.

2.3.6 Vegetation Type Mapping

The classification of vegetation types within the study area follows the height, life form and density classes of Muir (1997) (see Appendix 4). This is largely a structural classification suitable for broader scale mapping, but taking all ecologically significant strata into account.

The description of vegetation types leads with the most dominant strata (based on percent cover) and flora species listed start with the most dominant (Table 4). Table 5 further describes and categorises these strata and gives examples of potential growth forms for each, e.g. over-storey (U), mid-storey (M) and under-storey (G) vegetation strata.

Vegetation types recorded within the study area are grouped according to 'broad floristic formation' (refer to Table 4). A broad floristic formation describes the dominant growth form, cover and height as well as the dominant genus for the dominant stratum (Department of Environment and Heritage (DEH) 2003).

The vegetation mapping utilised high-resolution aerial photography of the entire study area at a scale of 1:7,500, with definition of vegetation polygons based on contrasting shading patterns. Ground-truthing of the study area was completed during the survey with vegetation descriptions made within selected vegetation polygons to confirm dominant structural layers and associated plant taxa. The 18 study sites and numerous relevé plots were overlaid on the aerial photography, and associated flora and vegetation data was used to provide vegetation type descriptions for individual polygons defined.

2.3.7 Vegetation Coding

A vegetation code was applied to each vegetation type mapped. This code is comprised of the dominant landform on which the vegetation type occurs and the characteristic plant taxa represented.

2.3.8 Vouchering

At least one voucher specimen was taken for each species collected to verify identification. Taxonomy was completed by Dr Jerome Bull at the Western Australian Herbarium (WAH) with use made of the WAH for confirmation of species identification.

Table 4 Vegetation type descriptions (based on the methods used under the National Vegetation Information System, DEH 2003).

Description	Species	Cover	Soils	Landscape Position	Example
Broad Floristic Formation	The one dominant genus name for the dominant stratum, e.g. <i>Acacia</i>	One cover class for the dominant stratum, e.g. Low Woodland. If two strata have the same cover range, the taller stratum is listed	Not relevant	Not relevant	<i>Acacia</i> Low Woodland
Vegetation Type (describe three strata - refer to Table 5)	Up to three dominant species listed for each stratum, e.g. <i>Acacia incurvaneura</i> , <i>Acacia pruinocarpa</i> and <i>Acacia pteraneura</i>	One cover class code for each stratum, e.g. Low Open Woodland, Open Shrubland, Low Open Shrubland	State soil colour and type, e.g. red sandy loam	Include the landscape position, e.g. stony plain	Low Open Woodland of <i>Acacia incurvaneura</i> , <i>A.pruinocarpa</i> and <i>A.pteraneura</i> over Open Shrubland of <i>Eremophila spathulata</i> over Low Open Shrubland of <i>Ptilotus schwartzii</i> , <i>P.obovatus</i> and <i>Solanum lasiophyllum</i> on red sandy loam on stony plains

Table 5 Vegetation Stratum Levels (modified from DEH 2003).

Stratum Description	Example Growth Forms
Over-storey (U)	
Tallest tree sub-stratum; for forests and woodlands this will generally be the dominant stratum	Trees, tree mallee, and vines (mallee shrubs)
Sub-canopy layer; second tree layer	
Sub-canopy layer; third tree layer	
Mid-storey (M)	
Tallest shrub layer	Shrubs, low trees, mallee shrubs, grass-trees, tree-ferns, cycads, palms, and vines (low shrubs, tall grasses, tall forbs, tall sedges)
Second shrub layer	
Third shrub layer	
Under-storey (U)	
Tallest ground species	Grasses, forbs, sedges, rushes, lichens, epiphytes, low shrubs, ferns, bryophytes, cycads, grass-trees, and vines
Other ground species	

2.3.9 Field Survey Constraints

The EPA Technical Guidance for Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (EPA 2016a) list seven potential limitations that field surveys may encounter. These limitations are addressed in Table 6.

Table 6 Relevance of limitations, as identified by EPA (2016a), to the flora and vegetation survey.

Constraint	Relevance
Availability of contextual information at a regional and local scale	No previous flora and vegetation surveys had been completed within the study area, however there are numerous surveys from the Kalgoorlie area that provide an excellent local database.
Proportion of flora recorded and/or collected, any identification issues	High intensity sampling was completed across the study area. A large proportion of the flora was likely recorded given the intensity of the survey and the very good seasonal conditions. Furthermore, the majority of species collected during the field survey were able to be fully identified to species level.
Survey timing, rainfall, season of survey	The field survey work was completed in early May 2021. Significant rainfall was received in February and March 2021 resulting in very good seasonal conditions during the field survey.
Disturbance that may have affected the results of the survey such as fire, flood or clearing	There were no disturbances recorded within the study area that influenced survey outcomes. Disturbances within the study area included extensive access tracks, dumping of rubbish, weeds, timber cutting, powerlines and industrial areas. Disturbances did not impact on the ability to complete the field survey.

Constraint	Relevance
Was the appropriate area fully surveyed (effort and extent)	<p>A Principal Botanist spent three field days covering the entire study area. A total of 18 quadrats supplemented by numerous relevé sites were assessed within the study area. This represented an extensive survey effort.</p> <p>The latest EPA technical guidelines (EPA 2016a) recommends that a minimum of three quadrats be sampled within each vegetation unit. All vegetation types recorded within the study area were sampled with at least three quadrats with the exception of two vegetation types which covered very small areas within the study area. For these two vegetation units, the entire area of each unit was intensively ground truthed during the field survey.</p> <p>Adequate sampling was confirmed by the species accumulation curve, which reached an asymptote.</p>
Access restrictions within the survey area	<p>The study area was accessed on foot, noting that vegetation mapping was facilitated by high-resolution aerial photography. Access did not pose any restrictions to undertaking the field survey.</p>
Competency/experience of the team carrying out the survey, including experience in the bioregion surveyed	<p>The Principal Botanist working on the survey (Dr Jerome Bull) has more than 15 years' experience working in the region. The Principal Botanist has completed a number of surveys in close proximity to the study area.</p>

3.0 RESULTS

3.1 Desktop Review

3.1.1 Previous Baseline Flora Surveys

Broad scale vegetation mapping of the Kalgoorlie area was first carried out by Gardner (1942) and later refined by Beard (1975). Beard (1978) described and mapped vegetation at a scale of 1:250 000, differentiating eight vegetation systems. Vegetation complexes consisted predominantly of low woodlands dominated by eucalypts in the south, with Mulga becoming increasingly dominant in the north. Vegetation within the study area was mapped as Mulga, *Allocasuarina cristata* and *Eucalyptus* low woodland, and Salmon Gum and Goldfields Blackbutt Medium Woodland. In terms of its floristic richness, the Goldfields region includes species from both the south-west (Merchant 1973, Hopper 1979) and the arid interior, as well as species which are either endemic to the Goldfields or have restricted geographic distributions.

The first detailed flora and vegetation survey of the Kurnalpi-Kalgoorlie area was undertaken as part of the 'Biological Survey of the Eastern Goldfields of Western Australia' by Keighery, Milewski and Hnatiuk (in McKenzie and Hall 1992). They describe the main vegetation as woodland and low woodland transitional between the Southwestern Interzone (dominated by *Eucalyptus*) and the Austin Botanical District (dominated by *Acacia aneura*). Many of the 45 vegetation complexes described feature *Casuarina cristata* with the total flora list comprising three species of ferns, two conifers and 486 species of flowering plants.

Further north of the study area, flora and vegetation of the Murchison has been assessed at a broad scale by Gardner (1942) and Beard (1976). More recently, the Department of Agriculture (now DPIRD) completed inventory and condition surveys of the Murchison and Sandstone-Yalgoo-Paynes Find area based on land system mapping (Curry *et al* 1994, Payne *et al* 1998). In addition to the larger broad scale surveys, a number of smaller intensive flora and vegetation surveys have been completed in recent years associated with resource development projects. These surveys have resulted in the collection of a significant amount of site-specific biological survey data, most of which has been undertaken for formal environmental impact assessment.

While no previous surveys have been completed within the boundary of the study area, a number of surveys have been undertaken nearby including Lynas' proposed cracking and leaching plant site at the eastern end of the study area (Onshore Environmental 2020), the proposed by-product storage site less than 10 km north-east of Kalgoorlie (Onshore Environmental 2021), the Black Swan Nickel Mine north-east of Kalgoorlie (Onshore Environmental 1995), and associated expansions around the Black Swan Nickel Mine (Onshore Environmental 2004a, 2004b). Findings from these local surveys are summarised in Appendix 5.

3.1.2 Threatened Flora listed under the EPBC Act

A search of the EPBC Act Protected Matters database was undertaken for a 50 km radius around the study area (DAWE 2021). Three Threatened Flora taxa listed under the EPBC Act

have been recorded as occurring or having suitable habitat within a 50 km radius of the study area; *Gastrolobium graniticum* (Endangered), *Tecticornia flabelliformis* (Vulnerable) and *Thelymitra stellata* (Endangered).

Gastrolobium graniticum is an erect open shrub reaching 2.5 m in height. It is known from seven populations occurring between Coolgardie and Southern Cross and is associated with granite outcrops and surrounding drainage lines. Due to the absence of suitable habitat this species is considered unlikely to occur within the study area.

Tecticornia flabelliformis is a small perennial succulent shrub growing to 0.3 m in height. It has a broad distribution occurring across southern Australia including Victoria, South Australia and Western Australia. In Western Australia it is known from several populations south and east of Kalgoorlie and one location to the north-west of Southern Cross. This species occurs around the edge of salt lakes and salt marshes (Carter 2010). Due to the absence of suitable habitat this species is considered unlikely to occur within the study area.

Thelymitra stellata is a sun orchid with a single leaf and a robust stem reaching 0.25 m in height. It is known from 23 populations occurring between Three Springs and Pinjarra (DEWHA 2008). The nearest records to the study area are approximately 500 km to the west, and the result from the database search is likely erroneous. Hence this species is considered unlikely to occur within the study area.

3.1.3 Threatened Flora listed under the IUCN Red List

A search of the IUCN database (IUCN 2021) determined that no Threatened Flora taxon was likely to occur within the study area.

3.1.4 Threatened Flora listed under the BC Act

No Threatened Flora taxon was identified from the DBCA's rare flora and NatureMap database searches (DBCA 2020a, DBCA 2021a) for a 50 km radius of the study area.

3.1.5 Priority Flora recognised by the DBCA

A total of 39 Priority flora taxa were identified from the DBCA's rare flora and Nature Map searches within a 50 km radius of the study area (Table 7). Three of these taxa were considered 'likely' to occur within the study area based on occurrence of habitat and proximity of previous records (Table 7). It was considered 'possible' that nine additional taxa may occur within the study area (Table 7). A further 27 taxa were determined as 'unlikely' to occur within the study area.

Table 7 Significant flora previously recorded from a 50 km search radius of the study area.

Taxon	Code	Habitat	Likelihood
<i>Acacia coatesii</i>	P1	Shallow, red, sandy clay on flat or gently sloping ground towards the base of a low greenstone ridge.	Unlikely
<i>Acacia epedunculata</i>	P1	Sand plains	Unlikely
<i>Acacia websteri</i>	P1	Red sand, clay or loam. Low-lying areas, flats.	Possible
<i>Alyxia tetanifolia</i>	P3	Sandy clay, loam, concretionary gravel; drainage lines, near lakes.	Unlikely

Taxon	Code	Habitat	Likelihood
<i>Angianthus prostratus</i>	P3	Red clay or loamy soils. Saline depressions.	Unlikely
<i>Austrostipa blackii</i>	P3	Unknown	Possible
<i>Austrostipa</i> sp. Carlingup Road (S. Kern & R. Jasper LCH 18459)	P1	Unknown	Possible
<i>Austrostipa</i> sp. Dowerin (G. Wiehl F 8004)	P2	Unknown	Unlikely
<i>Calandrinia lefroyensis</i>	P1	Flat plain, orange clayey sand with fine quartz.	Possible
<i>Cyathostemon verrucosus</i>	P3	Pale brown/yellowish deep sand over granite.	Unlikely
<i>Chrysocephalum apiculatum</i> subsp. <i>norsemanense</i>	P3	Deep sand	Unlikely
<i>Dampiera plumosa</i>	P1	Red sandy soils	Unlikely
<i>Elachanthus pusillus</i>	P2	Gentle upper slope, red clay soils with greenstone and granite gravel.	Unlikely
<i>Eremophila caerulea</i> subsp. <i>merrallii</i>	P4	Sand, clay or loam. Undulating plains.	Possible
<i>Eremophila praecox</i>	P2	Red/brown sandy loam. Undulating plains.	Likely
<i>Eremophila xantholaema</i>	P1	Stony, brown loam soils in <i>Eucalyptus-Casuarina</i> woodland on the upper slopes of low rocky hills.	Unlikely
<i>Eucalyptus jutsonii</i> subsp. <i>jutsonii</i>	P4	Red, yellow or orange deep sand, sandplains and dunes.	Unlikely
<i>Eucalyptus x brachyphylla</i>	P4	Sandy loam, granite rocks and outcrops.	Unlikely
<i>Frankenia glomerata</i>	P4	Low sandy rise within broad braided saline drainage line, saline sand.	Unlikely
<i>Goodenia salina</i>	P2	Well-drained, saline, grey or brown loamy clay. Low gypseous dunes near salt pans.	Unlikely
<i>Gompholobium cinereum</i>	P3	Yellow sand, clayey sand, brown loam, sandy gravel, laterite. Well-drained open sites, slopes, plains, roadsides	Possible
<i>Grevillea georgeana</i>	P3	Stony loam/clay. Ironstone hilltops & slopes.	Unlikely
<i>Hakea rigida</i>	P2	Sandy soils, yellow sand	Unlikely
<i>Isolepis australiensis</i>	P3	Silty sand, sandy clay. Lake margins, pools.	Unlikely
<i>Lepidium fasciculatum</i>	P3	Red earth soils, flats.	Likely
<i>Lepidium merrallii</i>	P3	Clay loam	Possible
<i>Melaleuca coccinea</i>	P3	Sandy loam over granite. Granite outcrops, sandplain, river valleys.	Unlikely
<i>Notisia intonsa</i>	P3	Gently inclined slopes of weathered basalt hills, red- brown shallow loam soils.	Unlikely
<i>Ptilotus chortophytus</i>	P1	Breakaway. Rocky brown loam with shale.	Unlikely
<i>Ptilotus procumbens</i>	P1	Wash away in deep red clay; broad flat, red cracking clay.	Unlikely
<i>Ptilotus rigidus</i>	P1	Small quartz and ironstone hill on the outer edge of salt lake.	Possible
<i>Phebalium appressum</i>	P1	Yellow sandplain.	Unlikely
<i>Phlegmatospermum eremaeum</i>	P3	Stony loam	Unlikely
<i>Rhodanthe uniflora</i>	P1	Brown earth. Open eucalyptus woodland.	Likely
<i>Ricinocarpos</i> sp. Eastern Goldfields (A. Williams 3)	P1	Rocky hillslope. Rocky surface. Red-brown sand-loam over felsic and mafic volcanics. Archean bedrock.	Unlikely
<i>Tecticornia flabelliformis</i>	P1, VU	Clay. Saline flats.	Unlikely
<i>Thryptomene</i> sp. Coolgardie (E. Kelso s.n. 1902)	P1	Unknown	Possible
<i>Thryptomene planiflora</i>	P1	Plains with yellow or brown to red sandy soils, in shrublands often dominated by <i>Acacias</i>	Unlikely
<i>Xanthoparmelia dayiana</i>	P3	Granite rock	Unlikely

3.1.6 TECs listed under State and Federal Legislation

A search of the EPBC Act Protected Matters database (DAWE 2021) confirmed there were no commonwealth listed TECs previously recorded from within, or adjacent to, the study area. Similarly, a search of the DBCA ecological community database (DBCA 2020b) confirmed there were no state listed TEC records for the immediate study area.

3.1.7 PECs recognised by DBCA

A search of DBCA's ecological community database (DBCA 2020b) confirmed that no PECs were known to occur within a 50 km radius of the study area.

3.2 Flora Species

A total number of 125 plant taxa (including varieties and subspecies) from 28 families and 73 genera were recorded from the study area (Table 8, Appendix 6). Species representation was greatest among the Poaceae, Chenopodiaceae, Scrophulariaceae, Fabaceae and Asteraceae families (Table 8). The most speciose genera were *Eremophila* (11 taxa), *Eucalyptus* (nine taxa), *Maireana* (eight taxa), *Acacia* (six taxa) and *Sida* (four taxa). The most common species encountered in the study area were *Acacia hemiteles* and *Senna artemisioides* subsp. *filifolia*, each recorded from 18 quadrats.

Table 8 Statistics for total flora recorded from the study area.

Overview	No. Taxa
Families	28
Genera	71
Taxa (species, subspecies, varieties)	125
Native Taxa	104
Introduced Taxa	21
Threatened Flora	0
Priority Flora	1
Range Extensions	1 (introduced taxa)
Speciose Families	No. Taxa
Poaceae	19
Chenopodiaceae	19
Scrophulariaceae	12
Fabaceae	11
Asteraceae	10
Myrtaceae	9
Speciose Genera	No. Taxa
<i>Eremophila</i>	11
<i>Eucalyptus</i>	9
<i>Maireana</i>	8
<i>Acacia</i>	6
<i>Sida</i>	4
<i>Atriplex</i>	3
<i>Enneapogon</i>	3
<i>Ptilotus</i>	3

The species accumulation curve reached an asymptote confirming that the study area was adequately sampled (Figure 5).

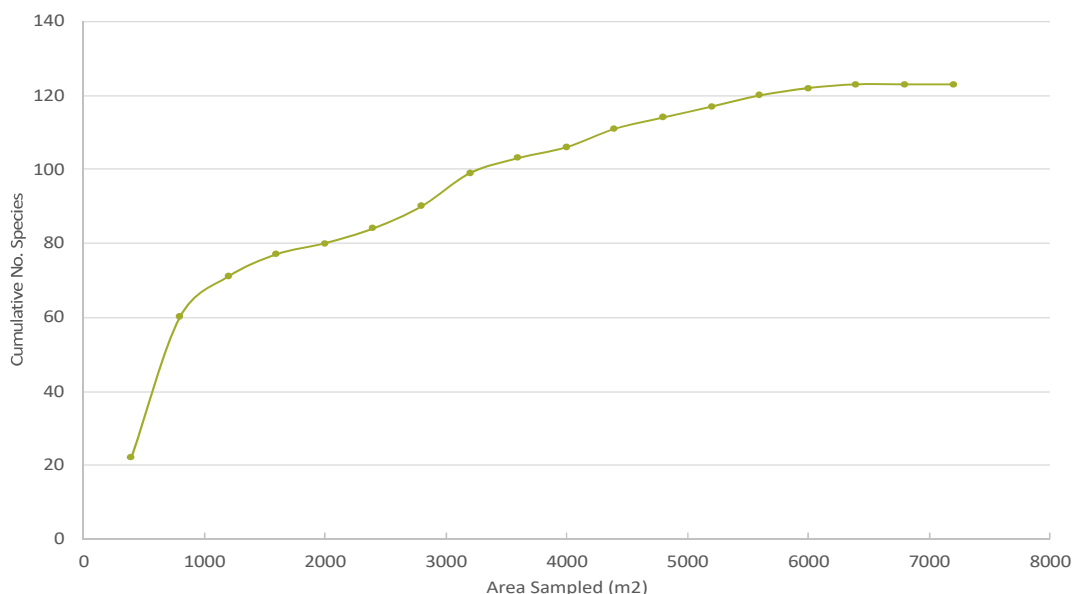


Figure 5 Species accumulation curve for the 18 quadrats formally assessed within the study area.

3.3 Significant Flora

3.3.1 Threatened Flora listed under the BC Act and EPBC Act

None of the plant taxa recorded from the study area were gazetted as Threatened Flora (T) under the EPBC Act or the BC Act.

3.3.2 Significant Flora

One Priority flora species was recorded from the study area; *Eremophila praecox* (Figure 6, Appendix 7). *Eremophila praecox* (Priority 2) is a broom shaped shrub reaching up to 3 m in height (Plate 1). Flowers are purple and appear in October or December. *Eremophila praecox* was recorded as a total of two plants from two locations within the study area (Figure 6). It reached a maximum height of 1.8 m and was recorded on sandy/stony plains.



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Conservation significant flora
recorded from the
study area and surrounds

Figure 6

Legend

Study Area

Significant Flora

Eremophila praecox (E.p)

N

0 50 100 150
Meters

1:7,500

Datum: GDA94

Projection: MGA Zone 51

Date: 15/04/2021

Scale: Full

Figure: 6

Sheet Size: A3

Internal Reference: Lynas_SS

Drawn by: GSM

Requested by: DB





Plate 1 *Eremophila praecox* within the study area.

3.3.3 *Eremophila praecox* - Regional Distribution

Eremophila praecox has a bimodal geographic distribution, occurring in the Goldfields region of Western Australia (Coolgardie bioregion) and the western part of the Eyre Peninsula in South Australia (Nullarbor, Eyre, Yorke Block bioregions). In the Goldfields of Western Australia, it has been documented growing on red brown sandy loam soils on undulating plains around the Coolgardie-Widgiemooltha-Kalgoorlie area (WAH 2020, Brown and Burchell 2011, Chinnock 2007). The database searches identified several *Eremophila praecox* locations occurring within close proximity of the study area, including one location 200 m north of the study area. Total plant numbers were generally low at each location. Habitat was described as red sand or clay with *Eucalyptus* woodlands.

Targeted searches extending outside the study area in May 2021 recorded *Eremophila praecox* from an additional nine locations (Figure 6, Appendix 7). The additional points were located north and south of the study area and within similar habitat to that represented within the study area.

3.4 Introduced Flora

A total of 21 introduced species were recorded from the study area:

- **Asphodelus fistulosus*;
- **Brassica* cf. *tournefortii*;
- **Carrichtera annua*;
- **Cenchrus ciliaris*;
- **Cenchrus setaceus*;
- **Centaurea melitensis*;
- **Chloris virgata* ;
- **Cuscuta* sp. indet;

- **Cynodon dactylon*;
- **Eragrostis curvula*;
- **Erigeron bonariensis*;
- **Gazania linearis*;
- **Lycium ferocissimum*;
- **Lysimachia arvensis*;
- **Medicago laciniata*;
- **Oligocarpus calendulaceus*;
- **Rumex vesicarius*;
- **Salvia verbenaca*;
- **Sonchus oleraceus*;
- **Tribulus terrestris*; and
- **Urochloa mosambicensis*.

No Declared Plants listed under the BAM Act 2007 were recorded from the study area. **Urochloa mosambicensis* has not previously been recorded from the Kalgoorlie area. It occurs in the Kimberley region of Western Australia, the Northern Territory, Queensland and northern New South Wales. Scattered records also occur in South Australia and southern New South Wales. The occurrence of **Urochloa mosambicensis* is likely facilitated by the close proximity of the Great Eastern Highway which supports a high density of intrastate and interstate traffic.

3.5 Vegetation Condition

Vegetation condition within the study area was rated as *good* or *degraded* using the Keighery (1994) scale, noting that 0.21 ha (2.1%) of the study area has previously been cleared of native vegetation (Figure 7). There were multiple disturbances present within the study area including access tracks, edge effects of the highway, roads, artificial drains, carparks, clearing, ground disturbance, timber cutting and rubbish.



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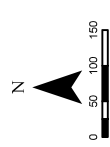
Western Power

Vegetation Condition
within the Study Area

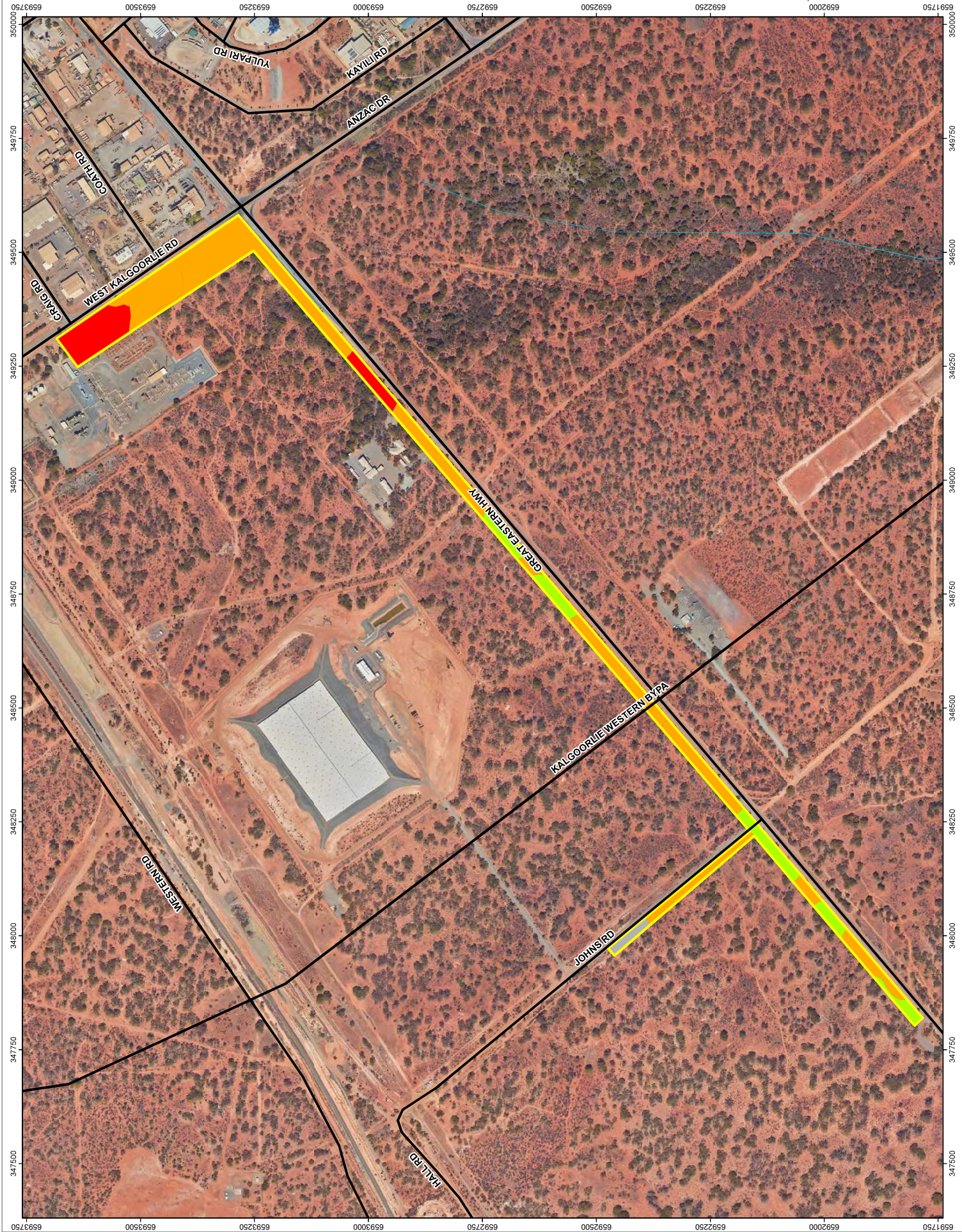
Figure 7

Legend

- Study Area
- Vegetation Types
 - Cleared
 - Degraded
 - Good-Degraded
 - Good



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Scale: Full
Figure: 7
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Drawn by: GSM
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3.6 Vegetation Types

A total of six vegetation types, classified as six broad floristic formations and occurring on two landform features were described and mapped from the study area (Figure 8, Table 9). A species by site matrix and raw data for the 18 study sites is presented in Appendices 8 and 9 respectively.

The latest EPA technical guidelines (EPA 2016a) recommend that a minimum of three quadrats should be sampled within each vegetation unit. All vegetation types complied with this recommendation with the exception of two vegetation types which covered small parts of the study area. For each of the two smaller units, targeted searches were conducted across the entire extent to ensure all flora were captured.

None of the vegetation types described and mapped from the study area were found to be aligned with any known TECs or PECs documented from the Coolgardie or Murchison bioregions.

The vegetation of the study area consisted predominantly of hardpan plains (sandy/stony plains) supporting Woodland of *Eucalyptus salmonophloia*, *Eucalyptus transcontinentalis* and *Eucalyptus lesouefii* with areas of Mallee (*Eucalyptus griffithsii* and *Eucalyptus oleosa* subsp. *oleosa*). Common shrubs species within the study area included *Eremophila scoparia*, *Acacia hemiteles*, *Senna artemisioides* subsp. *filifolia* and *Scaevola spinescens*. Vegetation types are described in more detail below.

Table 9 Vegetation types mapped from the study area.

Code	Broad Floristic Formation	Vegetation Type Description	Area (ha)	% of Study Area
FP EtEIEs SafAh	<i>Eucalyptus</i> Forest	Forest of <i>Eucalyptus transcontinentalis</i> , <i>Eucalyptus lesouefii</i> and <i>Eucalyptus salmonophloia</i> over Open Low Scrub A of <i>Senna artemisioides</i> subsp. <i>filifolia</i> and <i>Acacia hemiteles</i> on brown clay loam on drainage areas and floodplains	0.38	3.84
SP Es EscAh SafEsc	<i>Eucalyptus</i> Woodland	Woodland of <i>Eucalyptus salmonophloia</i> over Open Scrub of <i>Eremophila scoparia</i> and <i>Acacia hemiteles</i> over Low Scrub A of <i>Senna artemisioides</i> subsp. <i>filifolia</i> and <i>Eremophila scoparia</i> on brown clay loam on sandy/stony plains	3.12	31.19
SP Et EscEcAh SsOmSaf	<i>Eucalyptus</i> Open Low Woodland A	Open Low Woodland A of <i>Eucalyptus transcontinentalis</i> (<i>Eucalyptus lesouefii</i>) over Open Scrub of <i>Eremophila scoparia</i> , <i>Eremophila caperata</i> and <i>Acacia hemiteles</i> over Open Dwarf Scrub C of <i>Scaevola spinescens</i> , <i>Olearia muelleri</i> and <i>Senna artemisioides</i> subsp. <i>filifolia</i> on orange sandy loam on sandy/stony plains	1.41	14.15
SP Eg EscAh SsPo	<i>Eucalyptus</i> Open Tree Mallee	Open Tree Mallee of <i>Eucalyptus griffithsii</i> (<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>) over Open Scrub of <i>Eremophila scoparia</i> , <i>Acacia hemiteles</i> over Open Dwarf Scrub D of <i>Scaevola spinescens</i> and <i>Ptilotus obovatus</i> on orange loamy sand on sandy/stony plains	1.47	14.70

Code	Broad Floristic Formation	Vegetation Type Description	Area (ha)	% of Study Area
SP EoaEscAh AhSafEg PoMtEd	<i>Eremophila</i> Scrub	Scrub of <i>Eremophila oldfieldii</i> subsp. <i>angustifolia</i> , <i>Eremophila scoparia</i> and <i>Acacia hemiteles</i> over Low Scrub A of <i>Acacia hemiteles</i> , <i>Senna artemisioides</i> subsp. <i>filifolia</i> and <i>Eremophila glabra</i> over Open Dwarf Scrub D of <i>Ptilotus obovatus</i> , <i>Maireana triptera</i> and <i>Eremophila decipiens</i> on orange loamy sand on sandy/stony plains	2.20	22.00
SP PoMtMtr EIEsa EscAh	<i>Ptilotus</i> Open Dwarf Scrub D	Open Dwarf Scrub of <i>Ptilotus obovatus</i> , <i>Maireana</i> cf. <i>trichoptera</i> and <i>Maireana triptera</i> with Open Low Woodland A of <i>Eucalyptus lesouefii</i> and <i>Eucalyptus salubris</i> over Open Scrub of <i>Eremophila scoparia</i> and <i>Acacia hemiteles</i> on orange loamy sand on sandy/stony plains	1.20	12.05

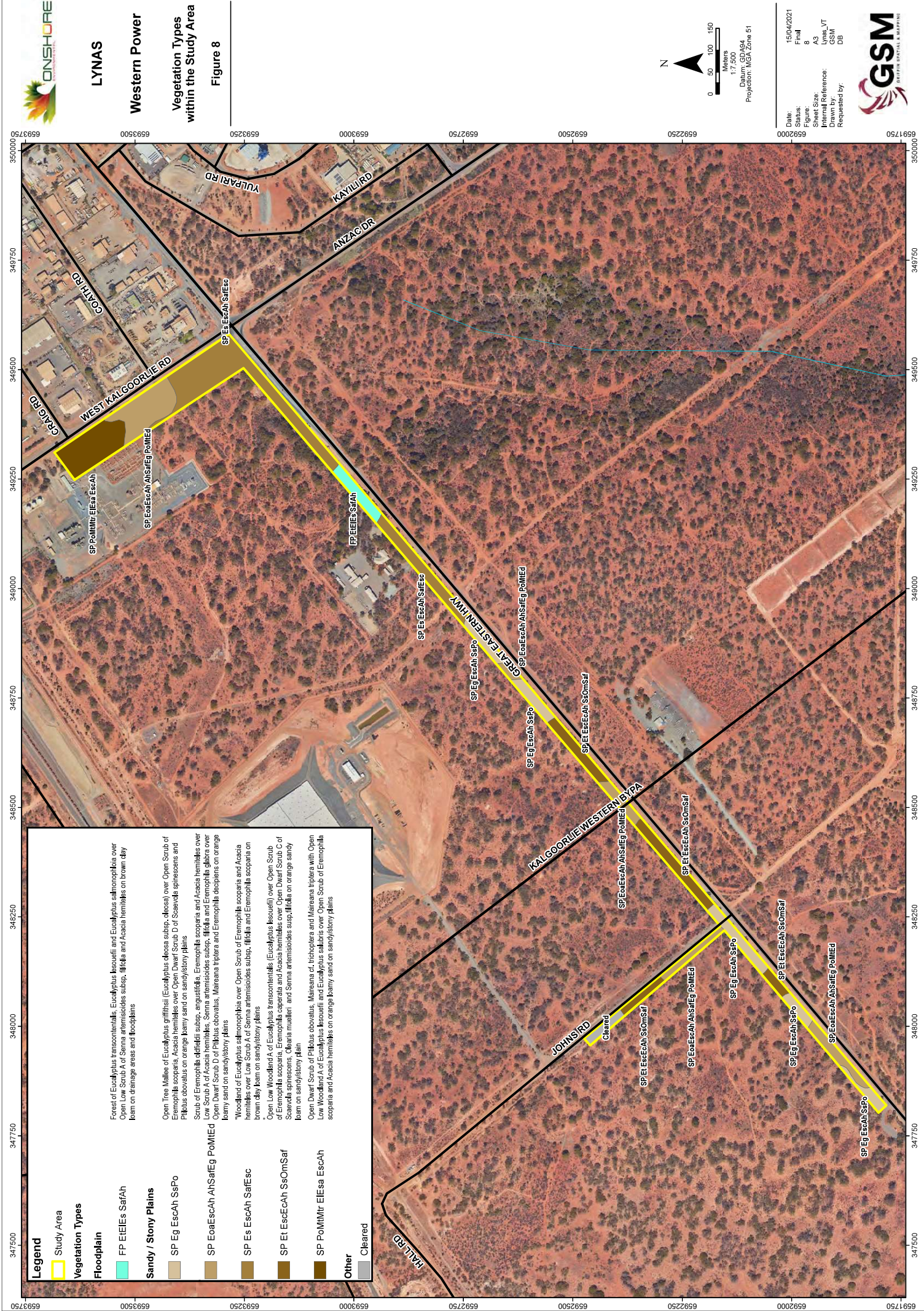


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Vegetation Types
within the Study Area

Figure 8



Legend

Study Area

Vegetation Types

Floodplain

FF EIEIES SstAh

Sandy / Stony Plains

SP EoEscAh SstPo

SP EoEscAh SstEsc

SP EtEscAh SstOnSst

SP PoMMtr EIEESa EscAh

Other

Cleared

Forest of *Eucalyptus transcendentalis*, *Eucalyptus leucolepis* and *Eucalyptus salmonophila* over
Open Low Scrub A of *Senna artemisioides* subsp. *afflicta* and *Acacia hemiletes* on brown clay
loam on drainage areas and floodplains

Open Tree Mallee of *Eucalyptus griffithii* (*Eucalyptus decora* subsp. *obsoleta*) over Open Scrub of
Eremophila scoparia, *Acacia hemiletes* over Open Dwarf Scrub D of *Scaevola spinescens* and
Ptilotus cuneatus on orange loamy sand on sandy/stony plains

Scrub of *Eremophila afflicta* subsp. *angustifolia*, *Eremophila scoparia* and *Acacia hemiletes* over
Low Scrub A of *Acacia hemiletes*, *Senna artemisioides* subsp. *afflicta* and *Eremophila glabra* over
Open Dwarf Scrub D of *Ptilotus cuneatus*, *Marsippospora triptera* and *Eremophila decipiens* on orange
loamy sand on sandy/stony plains

"Woodland of *Eucalyptus salmonophila* over Open Scrub of *Eremophila scoparia* and *Acacia*
hemiletes over Low Scrub A of *Senna artemisioides* subsp. *afflicta* and *Eremophila scoparia* on
brown clay loam on sandy/stony plains

Open Low Woodland A of *Eucalyptus transcendentalis* (*Eucalyptus leucolepis*) over Open Scrub
of *Eremophila scoparia*, *Eremophila scoparia* and *Acacia hemiletes* over Open Dwarf Scrub C of
Scaevola spinescens, *Clusia muelleri* and *Senna artemisioides* subsp. *afflicta* on orange sandy
loam on sandy/stony plain

Open Dwarf Scrub of *Ptilotus cuneatus*, *Marsippospora triptera* and *Marsippospora triptera* with Open
Low Woodland A of *Eucalyptus leucolepis* and *Eucalyptus saligna* over Open Scrub of *Eremophila*
scoparia and *Acacia hemiletes* on orange loamy sand on sandy/stony plains

Code	FP EtEIEs SafAh
Broad Floristic Formation	<i>Eucalyptus</i> Forest
Vegetation Type	Forest of <i>Eucalyptus transcontinentalis</i> , <i>Eucalyptus lesouefii</i> and <i>Eucalyptus salmonophloia</i> over Open Low Scrub A of <i>Senna artemisioides</i> subsp. <i>filifolia</i> and <i>Acacia hemiteles</i> on brown clay loam on drainage areas and floodplains



Quadrats Sampled	Li-14
Area (ha)	0.38 ha (3.84% of the study area)
Soils and Geology	Brown clay loam
Land Form	Drainage areas and floodplains
Priority Ecological Community	No
Conservation Significant Flora	None
Introduced (Weed) Species	None
Vegetation Condition	Degraded
Disturbances	Roads, access tracks, rubbish, altered drainage area due to road verge and drains
Average Fire Age	Old (6+ years)

Code	SP Es EscAh SafEsc
Broad Floristic Formation	<i>Eucalyptus</i> Woodland
Vegetation Type	Woodland of <i>Eucalyptus salmonophloia</i> over Open Scrub of <i>Eremophila scoparia</i> and <i>Acacia hemiteles</i> over Low Scrub A of <i>Senna artemisioides</i> subsp. <i>filifolia</i> and <i>Eremophila scoparia</i> on brown clay loam on sandy/stony plains



Quadrats Sampled	Li-11, Li-12, Li-15
Area (ha)	3.12 ha (31.20% of the study area)
Soils and Geology	Brown clay loam
Land Form	Sandy/stony plains
Priority Ecological Community	No
Conservation Significant Flora	None
Introduced (Weed) Species	* <i>Carrichtera annua</i> , * <i>Cenchrus ciliaris</i> , * <i>Oligocarpus calendulaceus</i> , * <i>Tribulus terrestris</i>
Vegetation Condition	Good-Degraded
Disturbances	Roads, access tracks, weeds, parking areas, powerline, ground disturbance, altered drainage
Average Fire Age	Old (6+ years)

Code	SP Et EscEcAh SsOmSaf
Broad Floristic Formation	<i>Eucalyptus</i> Open Low Woodland A
Vegetation Type	Open Low Woodland A of <i>Eucalyptus transcontinentalis</i> (<i>Eucalyptus lesouefii</i>) over Open Scrub of <i>Eremophila scoparia</i> , <i>Eremophila caperata</i> and <i>Acacia hemiteles</i> over Open Dwarf Scrub C of <i>Scaevola spinescens</i> , <i>Olearia muelleri</i> and <i>Senna artemisioides</i> subsp. <i>filifolia</i> on orange sandy loam on sandy/stony plains



Quadrats Sampled	Li-01, Li-06, Li-08, Li-17, Li-07, Li18
Area (ha)	0.38 ha (3.84% of the study area)
Soils and Geology	Orange sandy loam
Land Form	Sandy/stony plains
Priority Ecological Community	No
Conservation Significant Flora	<i>Eremophila praecox</i> (Priority 2)
Introduced (Weed) Species	* <i>Oligocarpus calendulaceus</i> , * <i>Carrichtera annua</i> , * <i>Salvia verbenaca</i>
Vegetation Condition	Good-Degraded
Disturbances	Roads/highway, access track, weeds, soil disturbance, rubbish
Average Fire Age	Old (6+ years)

Code	SP Eg EscAh SsPo
Broad Floristic Formation	<i>Eucalyptus</i> Open Tree Mallee
Vegetation Type	Open Tree Mallee of <i>Eucalyptus griffithsii</i> (<i>Eucalyptus oleosa</i> subsp. <i>oleosa</i>) over Open Scrub of <i>Eremophila scoparia</i> and <i>Acacia hemiteles</i> over Open Dwarf Scrub D of <i>Scaevola spinescens</i> and <i>Ptilotus obovatus</i> on orange loamy sand on sandy/stony plains



Quadrats Sampled	Li-02, Li-04, Li-10, Li-16
Area (ha)	1.47 ha (14.70% of the study area)
Soils and Geology	Orange loamy sand
Land Form	Sandy/stony plains
Priority Ecological Community	No
Conservation Significant Flora	None
Introduced (Weed) Species	* <i>Asphodelus fistulosus</i> , * <i>Carrichtera annua</i> , * <i>Medicago laciniata</i> , * <i>Oligocarpus calendulaceus</i> , * <i>Urochloa mosambicensis</i>
Vegetation Condition	Good
Disturbances	Road, access tracks, highway, rubbish, weeds, fenceline, ground disturbance
Average Fire Age	Old (6+ years)

Code	SP EoaEscAh AhSafEg PoMtEd
Broad Floristic Formation	<i>Eremophila</i> Scrub
Vegetation Type	Scrub of <i>Eremophila oldfieldii</i> subsp. <i>angustifolia</i> , <i>Eremophila scoparia</i> and <i>Acacia hemiteles</i> over Low Scrub A of <i>Acacia hemiteles</i> , <i>Senna artemisioides</i> subsp. <i>filifolia</i> and <i>Eremophila glabra</i> over Open Dwarf Scrub D of <i>Ptilotus obovatus</i> , <i>Maireana triptera</i> and <i>Eremophila decipiens</i> on orange loamy sand on sandy/stony plains



Quadrats Sampled	Li-03, Li-05, Li-09
Area (ha)	2.20 ha (22.00% of the study area)
Soils and Geology	Orange loamy sand
Land Form	Sandy/stony plain
Priority Ecological Community	No
Conservation Significant Flora	None
Introduced (Weed) Species	<i>*Asphodelus fistulosus</i> , <i>*Carrichtera annua</i> , <i>*Cuscuta</i> sp. indet, <i>*Lysimachia arvensis</i> , <i>*Medicago laciniata</i> , <i>*Oligocarpus calendulaceus</i> , <i>*Sonchus oleraceus</i>
Vegetation Condition	Good- Degraded
Disturbances	Roads, access tracks, rubbish, weeds, historic ground disturbance, drainage sumps, fence lines
Average Fire Age	Old (6+ years)

Code	SP PoMtMtr EIEsa EscAh
Broad Floristic Formation	<i>Ptilotus</i> Open Dwarf Scrub D
Vegetation Type	Open Dwarf Scrub of <i>Ptilotus obovatus</i> , <i>Maireana</i> cf. <i>trichoptera</i> and <i>Maireana triptera</i> with Open Low Woodland A of <i>Eucalyptus lesouefii</i> and <i>Eucalyptus salubris</i> over Open Scrub of <i>Eremophila scoparia</i> and <i>Acacia hemiteles</i> on orange loamy sand on sandy/stony plains



Quadrats Sampled	Li-13
Area (ha)	1.20 ha (12.05% of the study area)
Soils and Geology	Orange loamy sand
Land Form	Sandy/stony plains
Priority Ecological Community	No
Conservation Significant Flora	None
Introduced (Weed) Species	<i>*Carrichtera annua</i> , <i>*Cenchrus ciliaris</i> , <i>*Cenchrus setaceus</i> , <i>*Centaurea melitensis</i> , <i>*Eragrostis curvula</i> , <i>*Gazania linearis</i> , <i>*Oligocarpus calendulaceus</i> , <i>*Rumex vesicarius</i> , <i>*Sonchus oleraceus</i>
Vegetation Condition	Degraded
Disturbances	Roads, rubbish, weeds, rabbits, powerline, ground disturbance, tree logging
Average Fire Age	Old (6+years)

3.7 Representation and Reservation of Vegetation

Regional vegetation mapping completed by Beard (1978) was utilised to assess the representation of vegetation within the study area. One Beard vegetation association was represented within the study area (Table 10, Figure 3). In terms of representation, the Western Australian Government is committed to the National Objectives Targets for Biodiversity Conservation which includes a target that prevents clearance of ecological communities with an extent below 30% of that present at pre-European settlement (Department of Natural Resources and Environment 2002, EPA 2000).

When considering representation at the state level, the Beard vegetation association represented within the study area currently has 97.8% of the pre-European extent remaining (Table 10, Government of Western Australia 2018). The study area is located within the Coolgardie bioregion, specifically within the Eastern Goldfields subregion (as discussed in Section 1.3). When considering the representation of vegetation at the IBRA regional level and IBRA system level, >97.7% of the pre-European extent remains for the vegetation association represented (Table 10). The study area falls entirely within the City of Kalgoorlie-Boulder. At this local level 96.2% of the pre-European extent remains for the vegetation association represented (Table 10). Vegetation within the study area is therefore determined to be well represented at all levels (state-wide, bioregional [IBRA region and IBRA sub-region] and local).

In terms of reservation, there is a benchmark for a minimum of 15% of each Beard vegetation association to be protected in Class I-IV reserves (Commonwealth of Australia 1997). For the sole vegetation association represented within the study area, 1.56% of the current extent occurs within Class I-IV reserves, noting that 8.07% is within DBCA managed lands (Table 10). Hence the reservation status is determined to be of least concern for biodiversity conservation.

Table 10 Pre-European extent of vegetation represented on the basis of identified datasets (Government of Western Australia 2018).

Vegetation System / Association	Pre-European Extent (ha)	Current Extent (ha)	% Pre-European Extent Remaining	Current Extent in Class I-IV Reserves (ha)	% Current Extent in Class I-IV Reserves	Current Extent DBCA Managed Lands (ha)	% Current Extent DBCA Managed Lands
State-wide							
9 Medium woodland; coral gum (<i>Eucalyptus torquata</i>) & goldfields blackbutt (<i>E. leucaeifolia</i>)	240,509.33	235,161.94	97.78	3,669.89	1.56	18,984.28	8.07
Beard Vegetation System							
9 (Coolgardie)	98,770.16	95,687.65	96.88	520.65	0.54	10,831.59	11.32
IBRA Region							
9 - Coolgardie (COO)	240,441.99	235,100.97	97.78	3,669.89	1.56	18,984.28	8.07
IBRA Sub-Region							
9 - Eastern Goldfields (COO3)	235,047.15	229,757.07	97.75	3,669.89	1.60	18,981.18	8.26
Local Government - City of Kalgoorlie-Boulder							
9	38,706.67	37,223.28	96.17				

3.8 Conservation Significance of Vegetation

3.8.1 National Significance

None of the six vegetation types recorded from the study area support Threatened Flora listed under the EPBC Act, or are aligned with any commonwealth listed TECs. Therefore, vegetation within the study area is not considered to be of national significance.

3.8.2 State Significance

None of the six vegetation types recorded from the study area support Threatened Flora listed under the BC Act or are aligned with any state listed TECs or PECs. However, one vegetation type supported one species of Priority flora as currently listed by the DBCA; *Eremophila praecox* (Priority 2). Hence this vegetation type is considered to be of state significance (refer to Figure 8):

- SP Et EscEcAh SsOmSaf.

3.8.3 Local Significance

None of the vegetation types support plant taxa considered to represent range extensions or occurring at the extent of their known distribution. Hence, none of the vegetation types were determined to be of local conservation significance.

4.0 SUMMARY

The single season detailed flora and vegetation survey of the Western Power corridor proposed to service Lynas' Cracking and Leaching Plant was completed between the 7th and 9th of May 2021 under very good seasonal conditions.

A total number of 125 plant taxa (including varieties and subspecies) from 28 families and 73 genera were recorded from the study area. Species representation was greatest among the Poaceae, Chenopodiaceae, Scrophulariaceae, Fabaceae and Asteraceae families. The most speciose genera were *Eremophila*, *Eucalyptus*, *Maireana*, *Acacia* and *Sida*.

None of the plant taxa recorded from the study area were gazetted as Threatened Flora under the EPBC Act or the BC Act. One Priority flora taxon, as listed by the DBCA, was recorded as two plants from within the study area; *Eremophila praecox* (Priority 2). Targeted searches recorded *Eremophila praecox* from an additional nine points outside the northern and southern boundary of the study area.

The total flora included 21 introduced species, noting that none of these were listed as Declared Plants under the BAM Act.

Six vegetation types classified as six broad floristic formations were described and mapped from the study area. None of the vegetation types were aligned with known TECs or PECs documented from the Murchison or Coolgardie bioregions.

Vegetation condition within the study area was rated as *good* or *degraded*, with vegetation altered by obvious signs of disturbance that included access tracks, roads (including a major highway), artificial drains, carparks, clearing, ground disturbance, timber cutting and rubbish.

Vegetation within the study area was determined to be well represented at all levels (state-wide, bioregional [IBRA region and IBRA sub-region] and local), with approximately 98% of the pre-European extent remaining for the sole vegetation association.

5.0 STUDY TEAM

The detailed flora and vegetation survey was planned, co-ordinated and executed by the following personnel:

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Project Staff

Dr Darren Brearley	PhD	Project Manager and Principal Botanist
Dr Jerome Bull	PhD	Principal Botanist
Ms Jessica Waters	BSc	Senior Ecologist
Mrs Kerry Keenan		Data Analyst
Mr Todd Griffin		GIS Specialist

6.0 BIBLIOGRAPHY

- AECOM Australia (2014) Square Kilometre Array Ecological Assessment. Report prepared for the Department of Industry.
- Beard J.S. (1975) Vegetation Survey of Western Australia: Nullarbor. 1:1,000,000 Vegetation Series. UWA Press, Nedlands.
- Beard, J. S. (1976) Murchison. Explanatory Notes and Map Sheet 6, 1:1 000 000 series Vegetation Survey of Western Australia. University of Western Australia Press: Nedlands.
- Beard J.S. (1978) Vegetation of the Kalgoorlie Area, Western Australia. Vegetation Survey of Western Australia, 1:250 000 Series (2nd edition). Vegmap Publications, Perth, Australia.
- Beard, J.S. (1979) Vegetation Survey of Western Australia. Kimberley 1:1 000 000 Vegetation Series. University of Western Australia Press, Nedlands.
- Beard J.S. (1990) *Plant Life of Western Australia*. Kangaroo Press, Perth.
- Belbin, Lee. (2003) PATN - A Revised User's Guide. Blatant Fabrications Pty Ltd.
- Biological Surveys Committee (1984) Biological Survey of the Eastern Goldfields of Western Australia: Part 1 Introduction and Methods, Western Australian Museum, Perth WA
- Brown, A. and Buirchell, B.J. (2011) A Field Guide to the Eremophilas of Western Australia. Simon Nevill Publications.
- Bureau of Meteorology (2021) Climate Statistics for Australian Locations: Kalgoorlie-Boulder. <http://www.bom.gov.au/climate/averages/tables.shtml>
- Chinnock, R.J. (2007) Eremophila and allied genera: a monograph of the plant family Myoporaceae. Rosenberg Publishing.
- Conservation and Land Management (CALM) (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002- Coolgardie (COO03 – Eastern Goldfields synopsis), Department of Conservation and Land Management.
- Cowen, M. (2001) Murchison 1 (MUR1 – East Murchison subregion). A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions in 2002.
- CSIRO (2006) Australian Soil Resource Information System Website: http://www.asris.csiro.au/themes/Atlas.html#Atlas_Digital
- Curry P.J., Payne A.L., Leighton K.A., Hennig P. and Blood D.A. (1994) An inventory and condition survey of the Murchison River catchment, Western Australia, Department of Agriculture and Food.
- Department of Biodiversity Conservation and Attractions (DBCA) (2021a) NatureMap: Mapping Western Australia's biodiversity. <https://naturemap.dpaw.wa.gov.au>
- Department of Biodiversity, Conservation and Attractions (2020a) Threatened and Priority Flora Database Search. Request for Threatened and Priority Flora Information, letter from Threatened Flora Database Officer, May 2020.
- Department of Biodiversity, Conservation and Attractions (2020b) List of Threatened Ecological Communities on the Department of Parks and Wildlife's Threatened Ecological Community (TEC) Database endorsed by the Minister for the Environment. WA Threatened Species and Communities Unit, Department of Parks and Wildlife. Email received from TEC Ecologist of the Species and Communities Branch of DBCA, May 2020.

- Department of Environment (DoE) (2013) Interim Biogeographic Regionalisation for Australia, Revision 7. Online at: <http://www.environment.gov.au/parks/nrs/science/bioregion-framework/ibra/index.html>
- Department of Environment and Heritage (2003) Australian Vegetation Attributes Manual, Version 6.0.
- Department of Natural Resources and Environment (2002) Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local. Department of Natural Resources and Environment, Victoria.
- Department of the Agriculture, Water and Environment (DAWE) (2021a) Protected Matters Search Tool, accessed May 2021. <http://www.environment.gov.au/epbc/pms/>
- Department of the Environment, Water, Heritage and the Arts (2008). Approved Conservation Advice for *Thelymitra stellata* (Star Sun-orchid). Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/7060-conservation-advice.pdf>. In effect under the EPBC Act from 01-Oct-2008.
- Environmental Protection Authority (2000) Environmental Protection of Native Vegetation in Western Australia: Clearing of Native Vegetation with Particular Reference to Agricultural Areas, Position Statement No. 2, EPA, Perth.
- Environmental Protection Authority (2016a) Technical Guidance Flora and Vegetation Surveys for Environmental Impact Assessment, EPA, Perth.
- Environmental Protection Authority (2016b) Environmental Factor Guideline Flora and Vegetation, EPA, Perth.
- Environmental Protection Authority (2020) Statement of Environmental Principles, Factors and Objectives, EPA, Perth.
- Gardner, C.A. (1942) The vegetation of Western Australia. *J. Roy. Soc. W. Aust.* 28, 11-37.
- GHD (2011) Main Roads Western Australia, Report for Goldfields Highway, SLK 737-748 Biological Survey. Report prepared for Main Roads Western Australia.
- GHD (2016) Main Roads Western Australia, Goldfield Highway Material Sources SLK 748 to 781 Biological Survey. Report prepared for Main Roads Western Australia.
- Government of Western Australia. (2018) 2017 South West Vegetation Complex Statistics. Current as of October 2017. WA Department of Biodiversity, Conservation and Attractions, Perth. <https://catalogue.data.wa.gov.au/dataset/dbca>
- International Union for Conservation of Nature (IUCN) (2021) *Interactive Environmental Database Reporting Tool Search*. <http://www.iucnredlist.org>
- Keighery, B. J. (1994) Bushland Plant Survey: a Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc.), Nedlands, Western Australia.
- Keighery, G.J., Milewski, A.V. and Hnatiuk, R.J. (1992) Vegetation and flora. In: N.L. McKenzie and N.J. Hall (eds), The Biological Survey of the Eastern Goldfields of Western Australia: Part 8 Kurnalpi-Kalgoorlie Study Area. Records of the Western Australian Museum, Supplement No. 41.
- McKenzie, N.L. and Hall N.J. (1992). (eds) The Biological Survey of the Eastern Goldfields of Western Australia: Part 8 Kurnalpi-Kalgoorlie Study Area. Records of the Western Australian Museum, Supplement No. 41.
- Muir, B.G. (1977) Biological Survey of the Western Australian Wheatbelt. Records Western Australian Museum, Supplement No. 3.

- Onshore Environmental (1995) Outline for Biological and Environmental Components of a Notice of Intent, M27/39 and M27/200 Leases, Black Swan Nickel Project. Report prepared for Mining Project Investors.
- Onshore Environmental Consultants (2003a) Flora and Vegetation, Leinster - Wiluna Optic Fibre Cable Route. Report prepared for Sinclair Knight Merz Pty Ltd.
- Onshore Environmental Consultants (2003a) Flora and Vegetation, Meekatharra - Wiluna Optic Fibre Cable Route. Report prepared for Sinclair Knight Merz Pty Ltd.
- Onshore Environmental (2004a) Proposed Miscellaneous License Low Salinity Exploration Targets. Report prepared for Mining Project Investors.
- Onshore Environmental (2004b) Flora and Vegetation Survey - Federal Pit – Black Swan Pipeline Route. Report prepared for Mining Project Investors.
- Onshore Environmental Consultants (2007) Oakover Gold Ltd Mt Magnet Tenement Targeted Significant Flora Survey. Report prepared for Oakover Gold Ltd.
- Onshore Environmental Consultants (2020) Detailed Flora and Vegetation Survey Lot 500 Great Eastern Highway, Yilkari. Prepared for Lynas Pty Ltd
- Onshore Environmental Consultants (2021) Detailed Flora and Vegetation Survey By-product Storage Site. Prepared for Lynas Pty Ltd
- Carter, O. (2010) National Recovery Plan for the Bead Glasswort *Tecticornia flabelliformis*. Department of Sustainability and Environment, Melbourne
- Payne A.L., van Vreeswyk A.M.E., Leighton K.A., Pringle H.J. and Hennig P. (1998) An inventory and condition survey of the Sandstone-Yalgoo-Paynes Find area, Western Australia, Department of Agriculture and Food.
- Pringle HJR (1994) Pastoral resources and their management in the north-eastern Goldfields, Western Australia. Department of Agriculture Miscellaneous Publication 22/94.
- Pringle, H.J.R., Van Vreeswyk A.M.E. and Gilligan, S.A. (1994) An inventory and condition survey of rangelands in the North-eastern Goldfields, Western Australia (K.M.W. Howes, ed). Technical Bulletin No. 87, Department of Agriculture, Western Australia, ISBN 0 7309 5997 X.
- Shepherd, D.P., Beeston, G.R. and Hopkins A.J.M. (2002) Resource Management Technical Report 249, Native Vegetation in Western Australia: Extent, Type and Status. Prepared for the Government of Western Australia Department of Agriculture.
- Thackway and Cresswell (1995) An Interim Biogeographic Regionalisation for Australia: A framework for setting priorities in the National Reserves System Cooperative Program Version 4. Australian Nature Conservation Agency, Canberra.
- Tille, P. (2007) Resource Management Technical Report 313. *Soil-Landscapes of Western Australia's Rangelands and Arid Interior*. Department of Agriculture and Food Government of Western Australia.
- Western Australian Herbarium (2020) *Florabase - Information on the Western Australian flora*. Department of Biodiversity Conservation and Attractions.

APPENDIX 1

Conservation codes for species and communities of conservation significance

Categories used under the EPBC Act		
Status	Code	Description
Critically Endangered	Cr	Taxa considered to be facing an extremely high risk of extinction in the wild in the immediate future
Endangered	En	Taxa considered to be facing a very high risk of extinction in the wild in the near future
Vulnerable	Vu	Taxa considered to be facing a high risk of extinction in the wild in the medium-term future
Migratory	Mi	Species that migrate to, over and within Australia and its external territories

Conservation Codes used under the BC Act		
Status	Code	Description
Critically Endangered	CR	Taxa rare or likely to become extinct, as critically endangered taxa
Endangered	EN	Taxa rare or likely to become extinct, as endangered taxa
Vulnerable	VU	Taxa rare or likely to become extinct, as vulnerable taxa
Presumed Extinct	EX	Taxa presumed to be extinct
Migratory	IA	Birds subject to international agreements relating to the protection of migratory birds
Conservation Dependent	CD	Taxa of special conservation need, being species dependent on ongoing conservation intervention
Special Protection	OS	Taxa in need of special protection

Priority Flora and Fauna Under the BC Act		
Status	Code	Description
Priority 1: Poorly-known Species	P1	Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
Priority 2: Poorly-known Species	P2	Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.
Priority 3: Poorly-known Species	P3	Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.
Priority 4: Rare, Near Threatened and other species in need of monitoring	P4	<p>(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.</p> <p>(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable, but are not listed as Conservation Dependent.</p> <p>(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.</p>

Definitions, Categories and Criteria for Threatened and Priority Ecological Communities	
General Definitions	
Ecological Community	A naturally occurring biological assemblage that occurs in a particular type of habitat. Note: The scale at which ecological communities are defined will often depend on the level of detail in the information source, therefore no particular scale is specified.
Threatened Ecological Community (TEC)	A threatened ecological community (TEC) is one which is found to fit into one of the following categories; "presumed totally destroyed", "critically endangered", "endangered" or "vulnerable". Possible threatened ecological communities that do not meet survey criteria are added to DEC's Priority Ecological Community (PEC) Lists under Priorities 1, 2 and 3. Ecological Communities that are adequately known, are rare but not threatened, or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.
Assemblage	An assemblage is a defined group of biological entities.
Habitat	Habitat is defined as the areas in which an organism and/or assemblage of organisms lives. It includes the abiotic factors (e.g. substrate and topography), and the biotic factors.
Occurrence	A discrete example of an ecological community, separated from other examples of the same community by more than 20 meters of a different ecological community, an artificial surface or a totally destroyed community. By ensuring that every discrete occurrence is recognised and recorded future changes in status can be readily monitored.
Adequately Surveyed	An ecological community that has been searched for thoroughly in most likely habitats, by relevant experts.
Community structure	The spatial organisation, construction and arrangement of the biological elements comprising a biological assemblage (e.g. <i>Eucalyptus salmonophloia</i> woodland over scattered small shrubs over dense herbs; structure in a faunal assemblage could refer to trophic structure, e.g. dominance by feeders on detritus as distinct from feeders on live plants).

Definitions and Criteria for Presumed Totally Destroyed, Critically Endangered, Endangered and Vulnerable Ecological Communities	
Presumed Totally Destroyed (PD)	<p>An ecological community that has been adequately searched for but for which no representative occurrences have been located. The community has been found to be totally destroyed or so extensively modified throughout its range that no occurrence of it is likely to recover its species composition and/or structure in the foreseeable future.</p> <p>An ecological community will be listed as presumed totally destroyed if there are no recent records of the community being extant and either of the following applies (A or B):</p> <ul style="list-style-type: none"> A) Records within the last 50 years have not been confirmed despite thorough searches of known or likely habitats or B) All occurrences recorded within the last 50 years have since been destroyed
Critically Endangered (CR)	<p>An ecological community that has been adequately surveyed and found to have been subject to a major contraction in area and/or that was originally of limited distribution and is facing severe modification or destruction throughout its range in the immediate future, or is already severely degraded throughout its range but capable of being substantially restored or rehabilitated.</p> <p>An ecological community will be listed as Critically Endangered when it has been adequately surveyed and is found to be facing an extremely high risk of total destruction in the immediate future. This will be determined on the basis of the best available information, by it meeting any one or more of the following criteria (A, B or C):</p> <ul style="list-style-type: none"> A) The estimated geographic range, and/or total area occupied, and/or number of discrete occurrences since European settlement have been reduced by at least 90% and either or both of the following apply (i or ii): <ul style="list-style-type: none"> i) geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is imminent (within approximately 10 years); ii) modification throughout its range is continuing such that in the immediate future (within approximately 10 years) the community is unlikely to be capable of being substantially rehabilitated. B) Current distribution is limited, and one or more of the following apply (i, ii, iii) <ul style="list-style-type: none"> i) geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the immediate future (within approximately 10 years); ii) there are few occurrences, each of which is small and/or isolated and extremely vulnerable to known threatening processes; iii) there may be many occurrences but total area is very small and each occurrence is small and/or isolated and extremely vulnerable to known threatening processes. C) The ecological community exists only as highly modified occurrences that may be capable of being rehabilitated if such work begins in the immediate future (within approximately 10 years).

Definitions and Criteria for Presumed Totally Destroyed, Critically Endangered, Endangered and Vulnerable Ecological Communities	
Endangered (EN)	<p>An ecological community that has been adequately surveyed and found to have been subject to a major contraction in an area and/or was originally of limited distribution and is in danger of significant modification throughout its range or severe modification or destruction over most of its range in the near future</p> <p>An ecological community will be listed as Endangered when it has been adequately surveyed and is not Critically Endangered but is facing a very high risk of total destruction in the near future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B, or C):</p> <p>A) Geographic range, and/or total area occupied, and/or number of discrete occurrences have been reduced by at least 70% since European settlement and either or both of the following apply (i or ii):</p> <ol style="list-style-type: none"> the estimated geographic range, and/or total area occupied and/or number of discrete occurrences are continuing to decline such that total destruction of the community is likely in the short term future (within approximately 20 years); modification throughout its range is continuing such that in the short term future (within approximately 20 years) the community is unlikely to be capable of being substantially restored or rehabilitated. <p>B) Current distribution is limited, and one or more of the following apply (i, ii, iii)</p> <ol style="list-style-type: none"> geographic range and/or number of discrete occurrences, and/or area occupied is highly restricted and the community is currently subject to known threatening processes which are likely to result in total destruction throughout its range in the short term future (within approximately 20 years); There are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes; There may be many occurrences but total area is small and all or most occurrences are small and/or isolated and very vulnerable to known threatening processes. <p>C) The ecological community exists only as very modified occurrences that may be capable of being substantially restored or rehabilitated if such work begins in the short-term future (within approximately 20 years).</p>
Vulnerable (VU)	<p>An ecological community that has been adequately surveyed and is found to be declining and/or has declined in distribution and/or condition and whose ultimate security has not yet been assured and/or a community that is still widespread but is believed likely to move into a category of higher threat in the near future if threatening processes continue or begin operating throughout its range.</p> <p>An ecological community will be listed as Vulnerable when it has been adequately surveyed and is not Critically Endangered or Endangered but is facing a high risk of total destruction or significant modification in the medium (within approximately 50 years) to long-term future. This will be determined on the basis of the best available information by it meeting any one or more of the following criteria (A, B or C):</p> <p>A) The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated.</p> <p>B) The ecological community may already be modified and would be vulnerable to threatening processes, is restricted in area and/or range and/or is only found at a few locations.</p> <p>C) The ecological community may be still widespread but is believed likely to move into a category of higher threat in the medium to long-term future because of existing or impending threatening processes.</p>

Definitions and Criteria for Priority Ecological Communities	
Possible threatened ecological communities that do not meet survey criteria or that are not adequately defined are added to the Priority Ecological Community List under priorities 1, 2 and 3. These three categories are ranked in order of priority for survey and/or definition of the community. Ecological communities that are adequately known, and are rare but not threatened or meet criteria for Near Threatened, or that have been recently removed from the threatened list, are placed in Priority 4. These ecological communities require regular monitoring. Conservation Dependent ecological communities are placed in Priority 5.	
Priority 1 Poorly-known ecological communities	Ecological communities that are known from very few occurrences with a very restricted distribution (generally ≤ 5 occurrences or a total area of ≤ 100 ha). Occurrences are believed to be under threat either due to limited extent, or being on lands under immediate threat (e.g. within agricultural or pastoral lands, urban areas, active mineral leases) or for which current threats exist. May include communities with occurrences on protected lands. Communities may be included if they are comparatively well-known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under immediate threat from known threatening processes across their range.
Priority 2 Poorly-known ecological communities	Communities that are known from few occurrences with a restricted distribution (generally ≤ 10 occurrences or a total area of ≤ 200 ha). At least some occurrences are not believed to be under immediate threat (within approximately 10 years) of destruction or degradation. Communities may be included if they are comparatively well known from one or more localities but do not meet adequacy of survey requirements, and/or are not well defined, and appear to be under threat from known threatening processes.
Priority 3 Poorly-known ecological communities	<ul style="list-style-type: none"> i) Communities that are known from several to many occurrences, a significant number or area of which are not under threat or habitat destruction or degradation ii) 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; iii) 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 by domestic and/or feral stock, and inappropriate fire regimes <p>Communities may be included if they are comparatively well known from several localities but do not meet adequacy of survey requirements and/or are not well defined, and known threatening processes exist that could affect them</p>
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	<ul style="list-style-type: none"> a) Rare. Ecological communities known from few occurrences 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 communities are usually represented on conservation lands. b) Near Threatened. Ecological communities 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) Ecological communities that have been removed from the list of threatened communities during the past five years
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 2

**Vegetation condition scale
(as developed by Keighery 1994)**

Condition	Code	Description
Pristine	1	Pristine or nearly so, no obvious signs of disturbance.
Excellent	2	Vegetation structure intact, disturbance affecting individual species and weeds are non-aggressive species.
Very Good	3	Vegetation structure altered; obvious signs of disturbance.
Good	4	Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it.
Degraded	5	Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching Very Good condition without intensive management.
Completely Degraded	6	The structure of the vegetation is no longer intact and the area is completely or almost completely without native species.

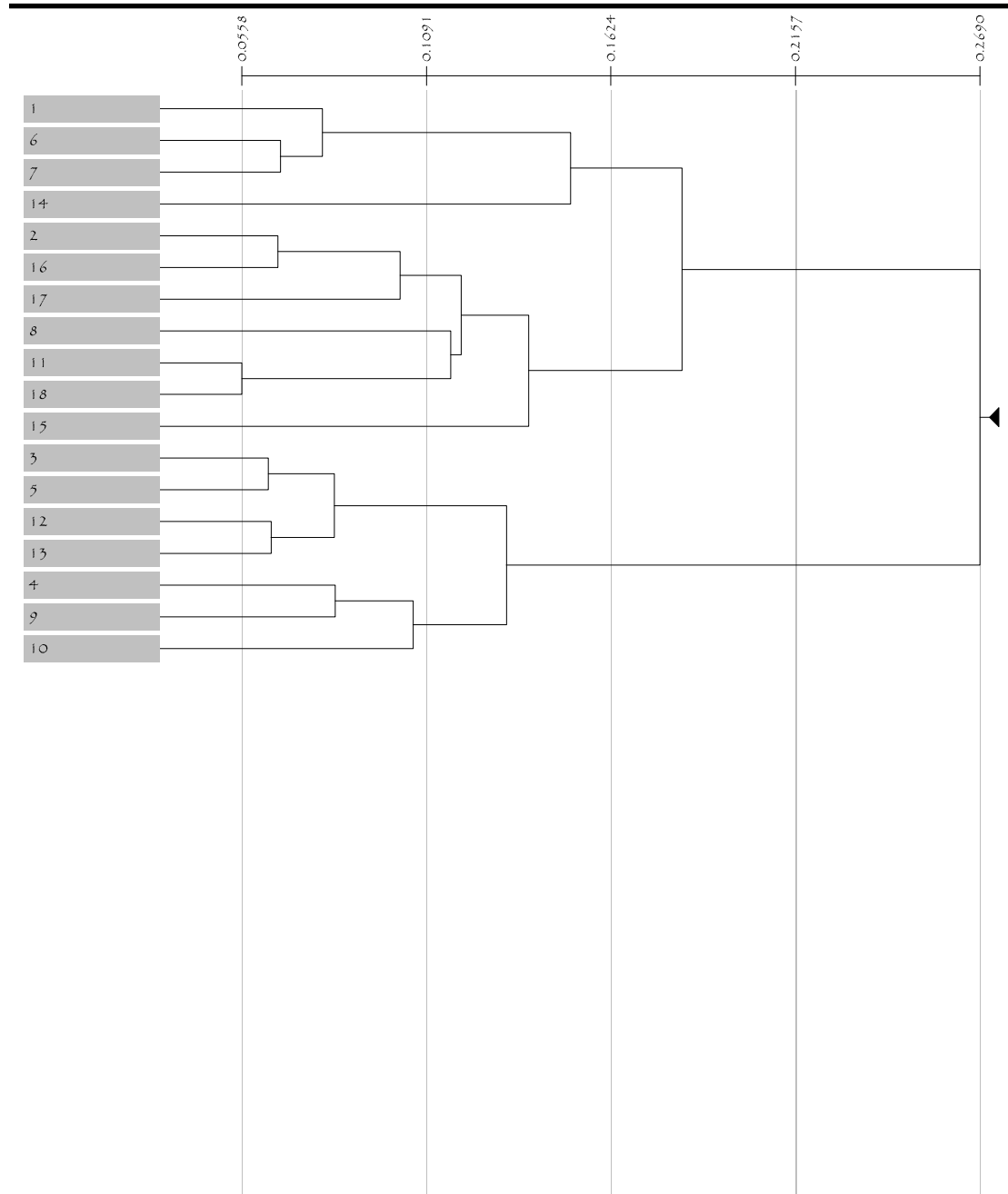
APPENDIX 3

Column Fusion Dendrogram

Table 1

Fusion Type: Flexible UPGMA Beta = -0.10
On Association: Two-Step (Columns) Created on: 11:28:57, June 14, 2021

Column Fusion Dendrogram



APPENDIX 4

Vegetation classifications for the study area based on Muir (1997).

LIFE FORM / HEIGHT CLASS	Canopy Cover			
	DENSE 70 % - 100%	MID DENSE 30% - 70%	SPARSE 10% - 30%	VERY SPARSE 2% - 10%
Trees > 30 m	Dense Tall Forest	Tall Forest	Tall Woodland	Open Tall Woodland
Trees 15 - 30 m	Dense Forest	Forest	Woodland	Open Woodland
Trees 5 - 15 m	Dense Low Forest A	Low Forest A	Low Woodland A	Open Low Woodland A
Trees < 5 m	Dense Low Forest B	Low Forest B	Low Woodland B	Open Low Woodland B
Mallee tree form	Dense Tree Mallee	Tree Mallee	Open Tree Mallee	Very Open Tree Mallee
Mallee shrub form	Dense Shrub Mallee	Shrub Mallee	Open Shrub Mallee	Very Open Shrub Mallee
Shrubs > 2 m	Dense Thicket	Thicket	Scrub	Open Scrub
Shrubs 1.5 - 2 m	Dense Heath A	Heath A	Low Scrub A	Open Low Scrub A
Shrubs 1 - 1.5 m	Dense Heath B	Heath B	Low Scrub B	Open Low Scrub B
Shrubs 0.5 - 1 m	Dense Low Heath C	Low Heath C	Dwarf Scrub C	Open Dwarf Scrub C
Shrubs 0 - 0.5 m	Dense Low Heath D	Low Heath D	Dwarf Scrub D	Open Dwarf Scrub D
Mat plants	Dense Mat Plants	Mat Plants	Open Mat Plants	Very Open Mat Plants
Hummock grass	Dense Hummock Grass	Mid-Dense Hummock Grass	Hummock Grass	Open Hummock Grass
Bunch grass > 0.5 m	Dense Tall Grass	Tall Grass	Open Tall Grass	Very Open Tall Grass
Bunch grass < 0.5 m	Dense Low Grass	Low Grass	Open Low Grass	Very Open Low Grass
Herbaceous spp.	Dense Herbs	Herbs	Open Herbs	Very Open Herbs
Sedges > 0.5 m	Dense Tall Sedges	Tall Sedges	Open Tall Sedges	Very Open Tall Sedges
Sedges < 0.5 m	Dense Low Sedges	Low Sedges	Open Low Sedges	Very Open Low Sedges
Ferns	Dense Ferns	Ferns	Open Ferns	Very Open Ferns
Mosses, liverworts	Dense Mosses	Mosses	Open Mosses	Very Open Mosses

APPENDIX 5

**Summary of results from previous flora and vegetation surveys within
or in close proximity to the study area**

Report	Survey Timing & Intensity	Vegetation Associations & Landform	Taxon Summary	Significant Flora
Onshore Environmental (2021) Detailed Flora and Vegetation Survey By-product Storage Site	12 th - 18 th of June 2020, 27 th October - 2 nd November 2020, 10 th - 14 th March 2020	12 vegetation associations	160 plant taxa from 37 families and 91 genera	<i>Eremophila praecox</i> (Priority 2)
Onshore Environmental (2020) Detailed Flora and Vegetation Survey Lot 500 Great Eastern Highway, Yilkari	20 th - 24 th of November 2019	10 vegetation associations	104 plant taxa from 25 families and 51 genera	<i>Eremophila praecox</i> (Priority 2)
Onshore Environmental (1995) Outline for Biological and Environmental Components of a Notice of Intent, M27/39 and M27/200 Leases, Black Swan Nickel Project	9-11 October 1995	10 vegetation associations	108 taxa, 28 families, 49 genera, 2 introduced species	No Threatened or Priority Flora recorded
Onshore Environmental (2004a) Proposed Miscellaneous License Low Salinity Exploration Targets	13 quadrats 29-30 October 2004	5 vegetation associations	97 taxa, 26 families, 50 genera, 1 introduced species	No Threatened or Priority Flora recorded
Onshore Environmental (2004b) Flora and Vegetation Survey – Federal Pit – Black Swan Pipeline Route	38 quadrats 25-26 October 2004	17 vegetation associations	119 taxa, 24 families, 48 genera, 8 introduced species	No Threatened or Priority Flora recorded

Report	Survey Timing & Intensity	Vegetation Associations & Landform	Taxon Summary	Significant Flora
Onshore Environmental (2003a) Flora and Vegetation, Leinster – Wiluna Optic Fibre Cable Route	No quadrats 15 – 19 September 2003	20 vegetation associations	188 taxa, 33 families, 73 genera, 4 introduced species	No Threatened Flora Three Priority Flora ¹ : <i>Eremophila pungens</i> (P4), <i>Grevillea inconspicua</i> (P4) and <i>Hemigenia exilis</i> (P4)
Onshore Environmental (2003b) Flora and Vegetation, Meekatharra – Wiluna Optic Fibre Cable Route	No quadrats 8 – 10 February 2003	11 vegetation associations	Total recorded taxa not provided; 3 introduced species	No Threatened Flora One Priority Flora: <i>Micromyrtus mucronulata</i> ² (P1)
Onshore Environmental (2007) Oakover Gold Ltd Mt Magnet Tenement Targeted Significant Flora Survey	No quadrats 21 – 24 February 2007	Four vegetation associations	Total recorded taxa not provide; no introduced species	No Threatened or Priority Flora recorded
GHD (2011) Main Roads Western Australia, Report for Goldfields Highway, SLK 737-748 Biological Survey	No quadrats 8 – 11 November 2010	Eight vegetation associations	98 taxa, 24 families, 50 genera, 2 introduced species	No Threatened or Priority Flora recorded

¹ *Baeckea* sp. Melita Station (H. Pringle 2738), *Calytrix erosipetala* and *Calytrix uncinata* were recorded as P3 species, and *Acacia balsamea* as a P4 species at the time of the survey, but are no longer listed as a Priority species

² Recorded as *Micromyrtus racemosa* var. *mucronata* at the time of the survey

Report	Survey Timing & Intensity	Vegetation Associations & Landform	Taxon Summary	Significant Flora
AECOM Australia (2014) Square Kilometre Array Ecological Assessment	65 quadrats September 2014	15 vegetation associations	199 taxa, 36 families, 82 genera, 4 introduced species	No Threatened Flora Six Priority Flora: <i>Gunnioopsis divisa</i> (P3), <i>Hemigenia tysonii</i> (P3), <i>Ptilotus beardie</i> (P3), <i>Sauropus</i> sp. Woolgorong (M. Officer s.n. 10/8/94) (P3), <i>Verticordia jamiesonii</i> (P3) and <i>Frankenia confuse</i> (P4); additional <i>Eremophila simulans</i> subsp. <i>megacalyx</i> (P3) was previously recorded in the area
GHD (2016) Main Roads Western Australia, Goldfield Highway Material Sources SLK 748 to 781 Biological Survey	20 quadrats 9 – 12 November 2015	Nine vegetation associations	114 taxa, 24 families, 55 genera, 1 introduced species	No Threatened or Priority Flora recorded

APPENDIX 6

Total flora list from the study area

FAMILY	GENUS	SPECIES	INFRA RANK	INFRA NAME
Amaranthaceae	<i>Ptilotus</i>	<i>exaltatus</i>		
Amaranthaceae	<i>Ptilotus</i>	<i>holosericeus</i>		
Amaranthaceae	<i>Ptilotus</i>	<i>obovatus</i>		
Apocynaceae	<i>Alyxia</i>	<i>buxifolia</i>		
Apocynaceae	<i>Leichhardtia</i>	<i>australis</i>		
Apocynaceae	<i>Vincetoxicum</i>	<i>lineare</i>		
Asphodelaceae	* <i>Asphodelus</i>	<i>fistulosus</i>		
Asteraceae	* <i>Centaurea</i>	<i>melitensis</i>		
Asteraceae	* <i>Erigeron</i>	<i>bonariensis</i>		
Asteraceae	* <i>Gazania</i>	<i>linearis</i>		
Asteraceae	* <i>Oligocarpus</i>	<i>calendulaceus</i>		
Asteraceae	* <i>Sonchus</i>	<i>oleraceus</i>		
Asteraceae	<i>Brachyscome</i>	<i>ciliaris</i>		
Asteraceae	<i>Cratystylis</i>	<i>microphylla</i>		
Asteraceae	<i>Olearia</i>	<i>muelleri</i>		
Asteraceae	<i>Taraxis</i>		sp.	indet
Asteraceae	<i>Vittadinia</i>	<i>humeralata</i>		
Boraginaceae	<i>Halgania</i>	<i>andromedifolia</i>		
Brassicaceae	* <i>Brassica</i>		cf.	<i>tournefortii</i>
Brassicaceae	* <i>Carrichtera</i>	<i>annua</i>		
Brassicaceae	<i>Lepidium</i>		cf.	<i>rotundum</i>
Casuarinaceae	<i>Casuarina</i>	<i>pauper</i>		
Chenopodiaceae	<i>Atriplex</i>		cf.	<i>semilunaris</i>
Chenopodiaceae	<i>Atriplex</i>	<i>stipitata</i>		
Chenopodiaceae	<i>Atriplex</i>	<i>vesicaria</i>		
Chenopodiaceae	<i>Chenopodium</i>	<i>gaudichaudianum</i>		
Chenopodiaceae	<i>Enchylaena</i>	<i>tomentosa</i>		
Chenopodiaceae	<i>Eriochiton</i>	<i>sclerolaenoides</i>		
Chenopodiaceae	<i>Maireana</i>		cf.	<i>trichoptera</i>
Chenopodiaceae	<i>Maireana</i>	<i>brevifolia</i>		
Chenopodiaceae	<i>Maireana</i>	<i>pentatropis</i>		
Chenopodiaceae	<i>Maireana</i>	<i>sedifolia</i>		
Chenopodiaceae	<i>Maireana</i>	<i>suaedifolia</i>		
Chenopodiaceae	<i>Maireana</i>	<i>thesioides</i>		
Chenopodiaceae	<i>Maireana</i>	<i>tomentosa</i>		
Chenopodiaceae	<i>Maireana</i>	<i>triptera</i>		
Chenopodiaceae	<i>Rhagodia</i>	<i>preissii</i>	subsp.	<i>preissii</i>
Chenopodiaceae	<i>Rhagodia</i>	<i>spinescens</i>		
Chenopodiaceae	<i>Salsola</i>	<i>australis</i>		
Chenopodiaceae	<i>Sclerolaena</i>	<i>diacantha</i>		
Chenopodiaceae	<i>Sclerolaena</i>	<i>obliquicuspis</i>		
Convolvulaceae	* <i>Cuscuta</i>		sp.	indet
Convolvulaceae	<i>Convolvulus</i>	<i>remotus</i>		
Euphorbiaceae	<i>Euphorbia</i>	<i>philochalix</i>		
Fabaceae	* <i>Medicago</i>	<i>laciniata</i>		
Fabaceae	<i>Acacia</i>	<i>acuminata</i>		
Fabaceae	<i>Acacia</i>	<i>calcarata</i>		
Fabaceae	<i>Acacia</i>	<i>collettioides</i>		

FAMILY	GENUS	SPECIES	INFRA RANK	INFRA NAME
Fabaceae	<i>Acacia</i>	<i>hemiteles</i>		
Fabaceae	<i>Acacia</i>	<i>jennerae</i>		
Fabaceae	<i>Acacia</i>	<i>tetragonophylla</i>		
Fabaceae	<i>Senna</i>	<i>artemisioides</i>	subsp.	<i>filifolia</i>
Fabaceae	<i>Senna</i>	<i>cardiosperma</i>		
Fabaceae	<i>Swainsona</i>		cf.	<i>colutoides</i>
Fabaceae	<i>Templetonia</i>	<i>incrassata</i>		
Geraniaceae	<i>Erodium</i>		sp.	indet
Goodeniaceae	<i>Scaevola</i>	<i>spinescens</i>		
Lamiaceae	* <i>Salvia</i>	<i>verbenaca</i>		
Loranthaceae	<i>Amyema</i>	<i>preissii</i>		
Malvaceae	<i>Abutilon</i>	<i>cryptopetalum</i>		
Malvaceae	<i>Lawrenzia</i>	<i>repens</i>		
Malvaceae	<i>Malva</i>		sp.	indet
Malvaceae	<i>Radyera</i>	<i>farragei</i>		
Malvaceae	<i>Sida</i>	<i>calyxhymenia</i>		
Malvaceae	<i>Sida</i>	<i>fibulifera</i>		
Malvaceae	<i>Sida</i>	<i>intricata</i>		
Malvaceae	<i>Sida</i>	<i>spodochroma</i>		
Myrtaceae	<i>Eucalyptus</i>	<i>celastroides</i>		
Myrtaceae	<i>Eucalyptus</i>	<i>griffithsii</i>		
Myrtaceae	<i>Eucalyptus</i>	<i>lesouefii</i>		
Myrtaceae	<i>Eucalyptus</i>	<i>oleosa</i>	subsp.	<i>oleosa</i>
Myrtaceae	<i>Eucalyptus</i>	<i>ravida</i>		
Myrtaceae	<i>Eucalyptus</i>	<i>salmonophloia</i>		
Myrtaceae	<i>Eucalyptus</i>	<i>salubris</i>		
Myrtaceae	<i>Eucalyptus</i>	<i>transcontinentalis</i>		
Myrtaceae	<i>Eucalyptus</i>	<i>ylgarnensis</i>		
Pittosporaceae	<i>Pittosporum</i>	<i>angustifolium</i>		
Poaceae	* <i>Cenchrus</i>	<i>ciliaris</i>		
Poaceae	* <i>Cenchrus</i>	<i>setaceus</i>		
Poaceae	* <i>Chloris</i>	<i>virgata</i>		
Poaceae	* <i>Cynodon</i>	<i>dactylon</i>		
Poaceae	* <i>Eragrostis</i>	<i>curvula</i>		
Poaceae	* <i>Urochloa</i>	<i>mosambicensis</i>		
Poaceae	<i>Aristida</i>	<i>contorta</i>		
Poaceae	<i>Austrostipa</i>	<i>elegantissima</i>		
Poaceae	<i>Austrostipa</i>	<i>platychaeta</i>		
Poaceae	<i>Dactyloctenium</i>	<i>radulans</i>		
Poaceae	<i>Enneapogon</i>	<i>avenaceus</i>		
Poaceae	<i>Enneapogon</i>	<i>caerulescens</i>		
Poaceae	<i>Enneapogon</i>	<i>polyphyllus</i>		
Poaceae	<i>Enteropogon</i>	<i>ramosus</i>		
Poaceae	<i>Eragrostis</i>		cf.	<i>leptocarpa</i>
Poaceae	<i>Panicum</i>	<i>effusum</i>		
Poaceae	<i>Paspalidium</i>	<i>basicladum</i>		
Poaceae	<i>Paspalidium</i>	<i>gracile</i>		
Poaceae	<i>Triodia</i>	<i>scariosa</i>		

FAMILY	GENUS	SPECIES	INFRA RANK	INFRA NAME
Polygonaceae	<i>*Rumex</i>	<i>vesicarius</i>		
Primulaceae	<i>*Lysimachia</i>	<i>arvensis</i>		
Santalaceae	<i>Exocarpos</i>	<i>aphyllus</i>		
Santalaceae	<i>Santalum</i>	<i>acuminatum</i>		
Santalaceae	<i>Santalum</i>	<i>spicatum</i>		
Sapindaceae	<i>Alectryon</i>	<i>oleifolius</i>		
Sapindaceae	<i>Dodonaea</i>	<i>lobulata</i>		
Sapindaceae	<i>Dodonaea</i>	<i>viscosa</i>	subsp.	<i>angustissima</i>
Scrophulariaceae	<i>Eremophila</i>	<i>alternifolia</i>		
Scrophulariaceae	<i>Eremophila</i>	<i>caperata</i>		
Scrophulariaceae	<i>Eremophila</i>	<i>decipiens</i>		
Scrophulariaceae	<i>Eremophila</i>	<i>glabra</i>		
Scrophulariaceae	<i>Eremophila</i>	<i>granitica</i>		
Scrophulariaceae	<i>Eremophila</i>	<i>interstans</i>	subsp.	<i>interstans</i>
Scrophulariaceae	<i>Eremophila</i>	<i>ionantha</i>		
Scrophulariaceae	<i>Eremophila</i>	<i>oldfieldii</i>	subsp.	<i>angustifolia</i>
Scrophulariaceae	<i>Eremophila</i>	<i>oppositifolia</i>	subsp.	<i>angustifolia</i>
Scrophulariaceae	<i>Eremophila</i>	<i>parvifolia</i>	subsp.	<i>auricampi</i>
Scrophulariaceae	<i>Eremophila</i>	<i>praecox</i>		
Scrophulariaceae	<i>Eremophila</i>	<i>scoparia</i>		
Scrophulariaceae	<i>Myoporum</i>	<i>montanum</i>		
Solanaceae	<i>Lycium</i>	<i>australe</i>		
Solanaceae	<i>Lycium</i>	<i>ferocissimum</i>		
Solanaceae	<i>Solanum</i>	<i>lasiophyllum</i>		
Solanaceae	<i>Solanum</i>	<i>nummularium</i>		
Thymelaeaceae	<i>Pimelea</i>	<i>microcephala</i>		
Zygophyllaceae	<i>*Tribulus</i>	<i>terrestris</i>		
Zygophyllaceae	<i>Roepera</i>		sp.	indet
Zygophyllaceae	<i>Roepera</i>	<i>eremaea</i>		

APPENDIX 7

Conservation significant flora recorded from the study area

Genus	Species	Conservation Code	No. Plants	Easting	Northing
Records from within the study area					
<i>Eremophila</i>	<i>praecox</i>	Priority 2	1	348082	6592031
<i>Eremophila</i>	<i>praecox</i>	Priority 2	1	348511	6592376
Records from outside the study area					
<i>Eremophila</i>	<i>praecox</i>	Priority 2	1	349117	6593134
<i>Eremophila</i>	<i>praecox</i>	Priority 2	1	348882	6592921
<i>Eremophila</i>	<i>praecox</i>	Priority 2	1	348881	6592921
<i>Eremophila</i>	<i>praecox</i>	Priority 2	2	349679	6592281
<i>Eremophila</i>	<i>praecox</i>	Priority 2	1	349284	6592545
<i>Eremophila</i>	<i>praecox</i>	Priority 2	1	348963	6593123
<i>Eremophila</i>	<i>praecox</i>	Priority 2	2	348884	6593258
<i>Eremophila</i>	<i>praecox</i>	Priority 2	1	348822	6593418
<i>Eremophila</i>	<i>praecox</i>	Priority 2	1	348792	6593643

APPENDIX 8

Species by site matrix for the study area

GENUS	SPECIES	INF_RANK	INF_NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
*Asphodelus	<i>fistulosus</i>					X	X	X													
*Carrichtera	<i>annua</i>					X	X	X	X						X	X					
*Cenchrus	<i>ciliaris</i>														X	X					
*Cenchrus	<i>setaceus</i>															X					
*Centaura	<i>melitensis</i>															X					
*Cuscuta	sp.					X															
*Eragrostis	<i>curvula</i>															X					
*Gazania	<i>linearis</i>															X					
*Lysimachia	<i>arvensis</i>					X															
*Medicago	<i>lacinata</i>					X	X	X													
*Oligocarpus	<i>calendulaceus</i>			X		X	X	X	X	X					X	X					
*Rumex	<i>vesicarius</i>															X					
*Salvia	<i>verbenaca</i>							X	X	X											
*Sonchus	<i>oleraceus</i>															X					
*Tribulus	<i>terrestris</i>					X									X						
*Urochloa	<i>mosambicensis</i>																	X			
Abutilon	<i>cryptopetalum</i>					X															
Acacia	<i>acuminata</i>						X	X		X							X				
Acacia	<i>calcarata</i>						X	X													
Acacia	<i>colleioides</i>											X									
Acacia	<i>hemiteles</i>			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Acacia	<i>jennerae</i>						X														
Acacia	<i>tetragonophylla</i>																X				
Alectryon	<i>oleifolius</i>																X				
Alyxia	<i>buxifolia</i>											X					X				
Amyema	<i>preissii</i>						X	X	X	X	X	X					X				
Aristida	<i>contorta</i>											X									
Asteraceae																					
Atriplex	<i>stipitata</i>					X	X	X								X			X	X	X
Atriplex	<i>vesicaria</i>			X		X						X									
Austrostipa	<i>elegantissima</i>														X						
Austrostipa	<i>platychaeta</i>							X	X									X			

GENUS	SPECIES	INF_RANK	INF_NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<i>Austrostipa</i>		sp.	indet			X				X	X	X	X	X		X	X		X		X
<i>Brachyscome</i>	<i>ciliaris</i>													X							
<i>Casuarina</i>	<i>pauper</i>											X									
<i>Chenopodium</i>	<i>gaudichaudianum</i>					X						X	X								
<i>Convolvulus</i>	<i>remotus</i>					X									X	X					
<i>Dactyloctenium</i>	<i>radicans</i>						X								X						
<i>Dodonaea</i>	<i>lobulata</i>							X													
<i>Dodonaea</i>	<i>viscosa</i>	subsp.	<i>angustissima</i>	X																	
<i>Enchylaena</i>	<i>tomentosa</i>					X	X	X				X	X		X	X	X				
<i>Enneapogon</i>	<i>avenaceus</i>					X		X	X	X		X			X						
<i>Enneapogon</i>	<i>caerulescens</i>					X	X									X					
<i>Enteropogon</i>	<i>ramosus</i>					X	X	X				X				X					
<i>Eragrostis</i>		cf.	<i>leptocarpa</i>			X															
<i>Eremophila</i>	<i>alternifolia</i>							X	X	X		X									
<i>Eremophila</i>	<i>caperata</i>							X	X	X	X							X	X		
<i>Eremophila</i>	<i>decipiens</i>											X		X		X	X				
<i>Eremophila</i>	<i>glabra</i>			X	X	X		X	X	X		X		X		X	X	X			X
<i>Eremophila</i>	<i>interstans</i>	subsp.	<i>interstans</i>	X	X					X								X			X
<i>Eremophila</i>	<i>ionantha</i>																X	X			
<i>Eremophila</i>	<i>oldfieldii</i>	subsp.	<i>angustifolia</i>					X					X			X					
<i>Eremophila</i>	<i>parvifolia</i>	subsp.	<i>auricampi</i>	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X		X
<i>Eremophila</i>	<i>scoparia</i>			X	X	X	X	X	X	X		X	X	X			X	X	X		X
<i>Eriochiton</i>	<i>sclerolaenoides</i>							X	X	X		X	X								
<i>Erodium</i>		sp.	indet			X															
<i>Eucalyptus</i>	<i>griffithsii</i>				X		X				X		X					X			
<i>Eucalyptus</i>	<i>lesouefii</i>			X	X			X								X	X	X	X		
<i>Eucalyptus</i>	<i>oleosa</i>	subsp.	<i>oleosa</i>	X	X						X						X	X			
<i>Eucalyptus</i>	<i>salmonophloia</i>													X	X		X	X			
<i>Eucalyptus</i>	<i>salubris</i>															X					
<i>Eucalyptus</i>	<i>transcontinentalis</i>			X				X	X	X							X			X	X
<i>Eucalyptus</i>	<i>yilgarnensis</i>									X							X		X		X
<i>Euphorbia</i>	<i>philochalix</i>					X						X				X					

GENUS	SPECIES	INF_RANK	INF_NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<i>Exocarpus</i>	<i>aphyllus</i>			X		X	X	X	X	X	X	X	X	X			X	X			X
<i>Haigania</i>	<i>andromedifolia</i>			X						X											
<i>Leichhardtia</i>	<i>australis</i>					X			X	X											
<i>Lepidium</i>		cf.	<i>rotundum</i>					X													
<i>Lycium</i>	<i>australe</i>						X										X				
<i>Maireana</i>	<i>brevifolia</i>														X						
<i>Maireana</i>	<i>pentatropis</i>			X																	
<i>Maireana</i>	<i>sedifolia</i>			X		X	X	X	X	X	X	X	X	X		X		X			X
<i>Maireana</i>	<i>suaedifolia</i>														X						
<i>Maireana</i>	<i>thesioides</i>															X					
<i>Maireana</i>	<i>tomentosa</i>										X										
<i>Maireana</i>	<i>triptera</i>					X	X	X				X	X			X					
<i>Maireana</i>		cf.	<i>trichoptera</i>		X	X		X	X	X	X	X	X	X	X	X				X	X
<i>Maireana</i>		sp.	indet			X		X				X			X	X				X	
<i>Myoporum</i>	<i>montanum</i>														X	X					
<i>Olearia</i>	<i>muelleri</i>			X	X		X	X	X	X	X	X	X	X		X	X	X			X
<i>Panicum</i>	<i>effusum</i>														X						
<i>Paspalidium</i>	<i>basiladum</i>						X														
<i>Paspalidium</i>	<i>gracile</i>															X					
<i>Pimelea</i>	<i>microcephala</i>					X															
<i>Pittosporum</i>	<i>angustifolium</i>							X	X		X	X	X				X				
<i>Poaceae</i>		sp.	indet				X														
<i>Ptilotus</i>	<i>exaltatus</i>							X								X				X	
<i>Ptilotus</i>	<i>holosericeus</i>					X						X			X						
<i>Ptilotus</i>	<i>obovatus</i>			X	X	X	X	X	X	X	X	X	X	X	X	X		X			X
<i>Radyera</i>	<i>farragei</i>			X																	
<i>Rhagodia</i>	<i>preissii</i>	subsp.	<i>preissii</i>												X		X				
<i>Rhagodia</i>	<i>spinescens</i>				X	X	X	X	X	X		X	X		X		X		X	X	
<i>Roepora</i>	<i>eremaea</i>			X			X	X	X						X	X		X		X	
<i>Roepora</i>		sp.	indet	X	X			X	X	X				X	X	X					X
<i>Salsola</i>	<i>australis</i>			X			X								X	X					
<i>Santalum</i>	<i>acuminatum</i>			X					X												

GENUS	SPECIES	INF_RANK	INF_NAME	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<i>Santalum</i>	<i>spicatum</i>											X									
<i>Scaevola</i>	<i>spinescens</i>											X						X		X	
<i>Sclerolaena</i>	<i>diacantha</i>												X						X		
<i>Sclerolaena</i>	<i>obliquicuspis</i>											X									
<i>Senna</i>	<i>artemisioides</i>	subsp.	<i>filifolia</i>	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Senna</i>	<i>cardiosperma</i>				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
<i>Sida</i>	<i>calyxhymenia</i>															X					
<i>Sida</i>	<i>fibulifera</i>						X	X													
<i>Sida</i>	<i>intricata</i>								X												
<i>Sida</i>	<i>spodochroma</i>														X						
<i>Solanum</i>	<i>lasiophyllum</i>				X	X			X	X		X	X			X					
<i>Solanum</i>	<i>nummularium</i>				X	X	X	X	X	X		X	X					X			
<i>Swainsona</i>		cf.	<i>colutooides</i>				X						X								
<i>Templetonia</i>	<i>incrassata</i>			X		X	X	X	X	X	X		X	X			X		X		X
<i>Vincetoxicum</i>	<i>lineare</i>								X												
<i>Vittadinia</i>	<i>humerata</i>					X		X													

APPENDIX 9

**Representative photographs, raw data and total flora spreadsheets
recorded for the 18 quadrats assessed within the study area**

Study Sites

Site	Landform	Broad Floristic Formation	Vegetation Association	Condition	Slope	Last Fire	Easting	Northing
LI-01	Sandy/ Stony Plain	Eucalyptus Open Woodland	Open Woodland of Eucalyptus transcintentalis and (Eucalyptus lesouefii) over Open Scrub of Eremophila scoparia and Eremophila interstans over Open Low Scrub B of Eremophila scoparia, Senna artemisioides subsp. filifolia and (Acacia hemiteles) over Open Dwarf Scrub C of Scaevola spinescens, Maireana sedifolia and (Halgania andromedifolia)	Good	Low	Old (6+ yr)	348080	6592031
LI-02	Hillslope	Eucalyptus Open Tree Mallee	Open Tree Mallee of Eucalyptus griffithsii and Eucalyptus lesouefii over Open Dwarf Scrub C of Scaevola spinescens, Eremophila glabra and Senna cardiosperma over Open Dwarf Scrub D of Olearia muelleri and Eremophila parvifolia	Good	Low	Old (6+ yr)	347828	6591820
LI-03	Sandy/ Stony Plain	Eremophila Scrub	Scrub of Eremophila oldfieldii subsp. angustifolia, Eremophila scoparia and Acacia hemiteles over Open Low Scrub A of Acacia hemiteles, Eremophila scoparia and Eremophila glabra over Open Low Scrub B of Senna artemisioides subsp. filifolia, Eremophila glabra and Maireana sedifolia over Open Dwarf Scrub D of Ptilotus obovatus and Maireana triptera over Very Open Low Grass of Enneapogon avenaceus, Enteropogon ramosus and Eragrostis cf. leptocarpa	Good	Low	Old (6+ yr)	347974	6591937
LI-04	Other	Eucalyptus Open Tree Mallee	Open Tree Mallee of Eucalyptus griffithsii over Low Scrub A of Eremophila scoparia, Senna cardiosperma and Senna artemisioides subsp. filifolia with Open Scrub of Eremophila scoparia and Acacia hemiteles over Open Dwarf Scrub D of Scaevola spinescens and Ptilotus obovatus	Good	Low	Old (6+ yr)	348186	6592121
LI-05	Sandy/ Stony Plain	Acacia Open Low Scrub A	Open Low Scrub A of Acacia hemiteles, Senna artemisioides subsp. filifolia and (Acacia jennerae) over Open Low Scrub B of Senna artemisioides subsp. filifolia over Open Dwarf Scrub D of Solanum lasiophyllum, Maireana cf. trichoptera and Sida calyphymia over Very Open Low Grass of Enneapogon avenaceus over Very Open Herbs of *Oligocarpus calendulaceus, Erodium sp. indet. and *Salvia verbenaca	Degraded	Low	Old (6+ yr)	348122	6592286
LI-06	Sandy/ Stony Plain	Acacia Scrub	Scrub of Acacia hemiteles, Santalum acuminatum and Eremophila scoparia with Open Low Woodland A of Eucalyptus transcintentalis and (Eucalyptus lesouefii) over Open Low Scrub A of Acacia hemiteles, Santalum acuminatum and Eremophila scoparia over Open Dwarf Scrub c of Scaevola spinescens, Eremophila parvifolia and Eremophila caperata	Good	Low	Old (6+ yr)	348333	6592242
LI-07	Sandy/ Stony Plain	Eucalyptus Open Woodland A	Open Woodland A of Eucalyptus transcintentalis over Very Open Tree Mallee of Eucalyptus yligarnensis over Open Scrub of Eremophila scoparia, Acacia hemiteles and (Exocarpus apyllus) over Open Low Scrub A of Senna artemisioides subsp. filifolia, Acacia hemiteles and Eremophila scoparia over Open Dwarf Scrub C of Scaevola spinescens, Maireana sedifolia and Senna artemisioides subsp. filifolia	Good	Low	Old (6+ yr)	348451	6592344
LI-08	Sandy/ Stony Plain	Eucalyptus Open Woodland A	Open Woodland A of Eucalyptus transcintentalis over Very Open Tree Mallee of (Eucalyptus oleosa subsp. oleosa) over Open Scrub of Eremophila caperata and Pittosporum angustifolium over Open Low Scrub B of Acacia hemiteles and Senna artemisioides subsp. filifolia over Open Dwarf Scrub D of Scaevola spinescens, Olearia muelleri and Eremophila caperata	Degraded	Low	Old (6+ yr)	348675	6592543
LI-09	Sandy/ Stony Plain	Eremophila Scrub	Scrub of Eremophila scoparia, Acacia hemiteles and (Eremophila alternifolia) over Low Scrub A of Acacia hemiteles, Senna artemisioides subsp. filifolia and Eremophila scoparia over Open Low Scrub B of Eremophila glabra and Scaevola spinescens over Open Dwarf Scrub D of Ptilotus obovatus, Maireana triptera and Maireana cf. trichoptera	Good	Low	Old (6+ yr)	348522	6592401
LI-10	Sandy/ Stony Plain	Eucalyptus Very Open Tree Mallee	Very Open Tree Mallee of Eucalyptus griffithsii over Open Scrub of Eremophila scoparia, Acacia hemiteles and (Exocarpus apyllus) over Open Low Scrub B of Eremophila scoparia, Acacia hemiteles and Senna artemisioides subsp. filifolia over Open Dwarf Scrub D of Ptilotus obovatus and Senna cardiosperma	Good	Low	Old (6+ yr)	348892	6592724
LI-11	Other	Eucalyptus Woodland	Woodland of Eucalyptus salmopholia over Low Scrub A of Eremophila scoparia and Senna artemisioides subsp. filifolia over Open Low Scrub B of Senna artemisioides subsp. filifolia and (Eremophila glabra) over Open Dwarf Scrub C of Scaevola spinescens and (Senna cardiosperma)	Good	Flat	Old (6+ yr)	349006	6592813
LI-12	Sandy/ Stony Plain	Eucalyptus Woodland	Woodland of Eucalyptus salmopholia over Open Scrub of Eremophila scoparia and Acacia hemiteles over Open Low Scrub A of Acacia hemiteles and Eremophila scoparia over Open Dwarf Scrub D of Atriplex stipitata, Maireana triptera and Salsola australis	Degraded	Low	Old (6+ yr)	349484	6593352
LI-13	Sandy/ Stony Plain	Ptilotus Open Dwarf Scrub D	Open Dwarf Scrub of Ptilotus obovatus, Maireana cf. trichoptera and Maireana triptera with Open Low Woodland A of Eucalyptus lesouefii and Eucalyptus salubris over Open Scrub of Eremophila scoparia and Acacia hemiteles over Open Low Scrub A of Eremophila scoparia, Acacia hemiteles and Senna artemisioides subsp. filifolia over Open Dwarf Scrub C of Eremophila decipiens, Senna artemisioides subsp. filifolia and Maireana sedifolia	Degraded	Low	Old (6+ yr)	349335	6593591
LI-14	Drainage Area/ Floodplain	Eucalyptus Forest	Forest of Eucalyptus transcintentalis, Eucalyptus lesouefii and Eucalyptus salmopholia over Open Low Scrub A of Senna artemisioides subsp. filifolia and Acacia hemiteles	Degraded	Flat	Old (6+ yr)	34924	6593000
LI-15	Sandy/ Stony Plain	Eucalyptus Forest	Forest of Eucalyptus salmopholia over Open Scrub of Eremophila scoparia, Acacia hemiteles and Eremophila ionantha over Open Low Scrub A of Eremophila ionantha, Senna artemisioides subsp. filifolia and Acacia hemiteles	Degraded	Low	Old (6+ yr)	349347	6593115
LI-16	Hillslope	Eucalyptus Open Tree Mallee	Open Tree Mallee of Eucalyptus oleosa subsp. oleosa and (Eucalyptus griffithsii) over Open Scrub of Eremophila caperata and Eremophila scoparia over Open Low Scrub A of Acacia hemiteles and Senna artemisioides subsp. filifolia over Open Dwarf Scrub C of Scaevola spinescens and Senna artemisioides subsp. filifolia	Good	Low	Old (6+ yr)	348746	6592599
LI-17	Hillcrest/ Upper Hillslope	Eucalyptus Open Low Woodland A	Open Low Woodland A of Eucalyptus transcintentalis and Eucalyptus lesouefii over Open Low Scrub A of Eremophila scoparia, Eremophila caperata and Acacia hemiteles over Open Dwarf Scrub D of Atriplex stipitata, Olearia muelleri and Scaevola spinescens	Good	Low	Old (6+ yr)	348601	6592473
LI-18	Sandy/ Stony Plain	Eucalyptus Open Low Woodland A	Open Low Woodland A of Eucalyptus transcintentalis over Very Open Tree Mallee of Eucalyptus yligarnensis over Open Scrub of Eremophila scoparia, (Acacia hemiteles and Eremophila interstans subsp. interstans) over Open Low Scrub B of Senna artemisioides subsp. filifolia over Open Dwarf Scrub C of Scaevola spinescens, Senna artemisioides and Maireana sedifolia	Good	Low	Old (6+ yr)	348404	6592308

Flora

Site	Genus	Species	Rank	Name	Significant	% Cover	Height (m)
LI-01	*Oligocarpus	calendulaceus			No	<1	0.1
LI-01	Acacia	hemiteles			No	<1	1.5-2.5
LI-01	Atriplex	vesicaria			No	1	0.7
LI-01	Dodonaea	viscosa	subsp.	angustissima	No	<1	1.5
LI-01	Eremophila	glabra			No	<1	1-1.5
LI-01	Eremophila	interstans	subsp.	interstans	No	1.5	2.5-4
LI-01	Eremophila	parvifolia	subsp.	auricampi	No	<1	0.5-1
LI-01	Eremophila	scoparia			No	4	1.5-2.5
LI-01	Eucalyptus	lesouefii			No	3	10
LI-01	Eucalyptus	oleosa	subsp.	oleosa	No	-	-
LI-01	Eucalyptus	transcontinentalis			No	6	10-15
LI-01	Exocarpus	aphyllus			No	<1	1-2
LI-01	Halgania	andromedifolia			No	1.5	1.2
LI-01	Maireana	sedifolia			No	2	0.5-1
LI-01	Olearia	muelleri			No	<1	0.5
LI-01	Ptilotus	holosericeus			No	<1	0.05
LI-01	Radyera	farragei			No	<1	0.3
LI-01	Roepera	eremaea			No	<1	0.4
LI-01	Roepera		sp.	indet	No	<1	0.2
LI-01	Salsola	australis			No	<1	0.4
LI-01	Santalum	acuminatum			No	1.5	1-1.5
LI-01	Scaevola	spinescens			No	3	0.5-1
LI-01	Senna	artemisioides	subsp.	filifolia	No	2	1-2
LI-01	Sida	spodochroma			No	<1	0.1
LI-01	Solanum	lasiophyllum			No	<1	0.4
LI-01	Solanum	nummularium			No	<1	0.3
LI-01	Templetonia	incrassata			No	-	1-2
LI-02	Acacia	hemiteles			No	1.5	1-2
LI-02	Eremophila	glabra			No	0.5	1
LI-02	Eremophila	interstans	subsp.	interstans	No	<1	1
LI-02	Eremophila	parvifolia	subsp.	auricampi	No	0.5	0.5-1
LI-02	Eremophila	scoparia			No	-	-
LI-02	Eucalyptus	griffithsii			No	15	8-10
LI-02	Eucalyptus	lesouefii			No	5	8-12
LI-02	Eucalyptus	oleosa	subsp.	oleosa	No	1.5	10-12
LI-02	Maireana	pentatropis			No	1	0.5
LI-02	Maireana		cf.	trichoptera	No	<1	0.2
LI-02	Olearia	muelleri			No	1.5	0.4
LI-02	Ptilotus	obovatus			No	<1	0.5
LI-02	Rhagodia	spinescens			No	<1	0.5
LI-02	Roepera		sp.	indet	No	<1	0.2
LI-02	Scaevola	spinescens			No	1.5	0.5-1
LI-02	Sclerolaena	diacantha			No	<1	0.15
LI-02	Senna	artemisioides	subsp.	filifolia	No	<1	0.5
LI-02	Senna	cardiosperma			No	0.5	0.5-1
LI-02	Sida	spodochroma			No	<1	0.1
LI-02	Solanum	lasiophyllum			No	<1	0.4
LI-02	Solanum	nummularium			No	-	-
LI-03	*Asphodelus	fistulosus			No	0.5	0.3
LI-03	*Carrichtera	annua			No	1	0.15
LI-03	*Cuscuta		sp.	indet	No	<1	Cr
LI-03	*Lysimachia	arvensis			No	<1	0.1
LI-03	*Medicago	laciniata			No	<1	0.1
LI-03	*Oligocarpus	calendulaceus			No	1	0.1
LI-03	*Sonchus	oleraceus			No	<1	0.3
LI-03	Abutilon	cryptopetalum			No	<1	0.5
LI-03	Acacia	hemiteles			No	8	1-2.5

Site	Genus	Species	Rank	Name	Significant	% Cover	Height (m)
LI-03	Atriplex	stipitata			No	<1	0.6
LI-03	Atriplex	vesicaria			No	<1	0.5
LI-03	Austrostipa		sp.	indet	No	0.25	0.4
LI-03	Chenopodium	gaudichaudianum			No	<1	0.5
LI-03	Convolvulus	remotus			No	<1	Cr
LI-03	Enchylaena	tomentosa			No	<1	0.4
LI-03	Enneapogon	avenaceus			No	3	0.2
LI-03	Enneapogon	caerulescens			No	<1	0.2
LI-03	Enteropogon	ramosus			No	0.5	0.35
LI-03	Eragrostis		cf.	leptocarpa	No	1	0.4
LI-03	Eremophila	glabra			No	6	1-2
LI-03	Eremophila	oldfieldii	subsp.	angustifolia	No	4.5	2-4
LI-03	Eremophila	scoparia			No	5	1.5-2.5
LI-03	Erodium		sp.	indet	No	<1	0.1
LI-03	Euphorbia	philochalix			No	<1	0.02
LI-03	Exocarpus	aphyllus			No	<1	1
LI-03	Leichhardtia	australis			No	<1	Cl
LI-03	Maireana	sedifolia			No	3	0.5-1
LI-03	Maireana	triptera			No	1	0.4
LI-03	Maireana		cf.	trichoptera	No	<1	0.3
LI-03	Maireana		sp.	indet	No	0.5	0.5-1
LI-03	Pimelea	microcephala			No	<1	1-2
LI-03	Ptilotus	holosericeus			No	<1	0.05
LI-03	Ptilotus	obovatus			No	2	0.5
LI-03	Rhagodia	spinescens			No	1	0.5-1
LI-03	Scaevola	spinescens			No	3	0.5-1
LI-03	Sclerolaena	diacantha			No	<1	0.1
LI-03	Senna	artemisioides	subsp.	filifolia	No	7	0.5-1
LI-03	Sida	fibulifera			No	<1	0.2
LI-03	Solanum	lasiophyllum			No	<1	0.3
LI-03	Templetonia	incrassata			No	<1	2.5
LI-03	Vittadinia	humeralata			No	<1	0.3
LI-04	*Asphodelus	fistulosus			No	<1	0.2
LI-04	*Carrichtera	annua			No	<1	0.1
LI-04	*Medicago	laciniata			No	-	-
LI-04	*Oligocarpus	calendulaceus			No	<1	0.1
LI-04	Acacia	hemiteles			No	3	1-2
LI-04	Amyema	preissii			No	<1	Aer Par
LI-04	Dactyloctenium	radulans			No	-	-
LI-04	Enchylaena	tomentosa			No	<1	0.35
LI-04	Enneapogon	caerulescens			No	-	-
LI-04	Enteropogon	ramosus			No	<1	0.3
LI-04	Eremophila	scoparia			No	5	1-2.5
LI-04	Eucalyptus	griffithsii			No	12	8-10
LI-04	Exocarpus	aphyllus			No	1	2-3
LI-04	Lycium	australe			No	<1	0.6
LI-04	Maireana	sedifolia			No	<1	1-1.3
LI-04	Maireana	triptera			No	<1	0.35
LI-04	Olearia	muelleri			No	0.5	0.3
LI-04	Paspalidium	basicladum			No	-	-
LI-04	Poaceae		sp.	indet	No	<1	0.1
LI-04	Ptilotus	obovatus			No	1	0.4
LI-04	Rhagodia	spinescens			No	<1	0.6
LI-04	Salsola	australis			No	-	-
LI-04	Scaevola	spinescens			No	1.5	0.5-1
LI-04	Sclerolaena	diacantha			No	-	-
LI-04	Senna	artemisioides	subsp.	filifolia	No	1.5	1-2.5
LI-04	Senna	cardiosperma			No	2.5	1-2

Site	Genus	Species	Rank	Name	Significant	% Cover	Height (m)
Li-04	Sida	fibulifera			No	<1	0.2
Li-04	Solanum	nummularium			No	<1	0.4
Li-04	Swainsona		cf.	colutoides	No	-	-
Li-04	Templetonia	incrassata			No	-	-
Li-05	*Asphodelus	fistulosus			No	0.5	0.2
Li-05	*Carrichtera	annua			No	1	0.15
Li-05	*Medicago	laciniata			No	<1	0.1
Li-05	*Oligocarpus	calendulaceus			No	2	0.1
Li-05	*Salvia	verbenaca			No	2	0.1
Li-05	Acacia	acuminata			No	-	-
Li-05	Acacia	calcarata			No	<1	0.5
Li-05	Acacia	hemiteles			No	5	1-2.5
Li-05	Acacia	jennerae			No	1	2-4
Li-05	Atriplex	stipitata			No	1	0.4
Li-05	Austrostipa	platychaeta			No	<1	0.5-1
Li-05	Convolvulus	remotus			No	<1	Cl
Li-05	Dodonaea	lobulata			No	<1	0.5
Li-05	Enchylaena	tomentosa			No	<1	0.3
Li-05	Enneapogon	avenaceus			No	5	0.2
Li-05	Enteropogon	ramosus			No	<1	0.3
Li-05	Eremophila	glabra			No	<1	0.5
Li-05	Eremophila	oldfieldii	subsp.	angustifolia	No	0.5	1-2
Li-05	Eremophila	parvifolia	subsp.	auricampi	No	<1	0.6
Li-05	Eremophila	scoparia			No	0.5	0.5-1.5
Li-05	Eriochiton	sclerolaenoides			No	<1	0.1
Li-05	Erodium		sp.	indet	No	0.5	0.1
Li-05	Lepidium		cf.	rotundum	No	<1	0.05
Li-05	Maireana	sedifolia			No	<1	0.5-1
Li-05	Maireana	triptera			No	<1	0.3
Li-05	Maireana		cf.	trichoptera	No	2	0.2
Li-05	Maireana		sp.	indet	No	0.5	0.5
Li-05	Pittosporum	angustifolium			No	-	-
Li-05	Ptilotus	exaltatus			No	<1	0.1
Li-05	Ptilotus	obovatus			No	1	0.3
Li-05	Rhagodia	spinescens			No	<1	0.5-1
Li-05	Roepera	eremaea			No	<1	0.2
Li-05	Roepera		sp.	indet	No	<1	0.2
Li-05	Scaevola	spinescens			No	<1	0.5-1
Li-05	Sclerolaena	diacantha			No	1	0.1
Li-05	Sclerolaena	obliquicuspis			No	0.5	0.25
Li-05	Senna	artemisioides	subsp.	filifolia	No	3.5	0.5-2.5
Li-05	Senna	cardiosperma			No	0.5	0.5-1
Li-05	Sida	calyxhymenia			No	1	0.4
Li-05	Sida	intricata			No	<1	0.2
Li-05	Solanum	lasiophyllum			No	2	0.4
Li-05	Solanum	nummularium			No	0.5	0.4
Li-05	Vittadinia	humera			No	<1	0.1
Li-06	*Carrichtera	annua			No	<1	0.15
Li-06	*Oligocarpus	calendulaceus			No	0.5	0.1
Li-06	*Salvia	verbenaca			No	<1	0.1
Li-06	Acacia	hemiteles			No	7	1.5-2.5
Li-06	Amyema	preissii			No	0.5	Aer par
Li-06	Austrostipa	platychaeta			No	1	0.5-1.5
Li-06	Convolvulus	remotus			No	<1	Cl
Li-06	Enneapogon	avenaceus			No	<1	0.2
Li-06	Eremophila	alternifolia			No	-	-
Li-06	Eremophila	caperata			No	1	0.5
Li-06	Eremophila	glabra			No	<1	1

Site	Genus	Species	Rank	Name	Significant	% Cover	Height (m)
Li-06	Eremophila	parvifolia	subsp.	auricampi	No	1	0.3-0.8
Li-06	Eremophila	scoparia			No	2	1.5-2.5
Li-06	Eucalyptus	lesouefii			No	1	10
Li-06	Eucalyptus	transcontinentalis			No	8	10-15
Li-06	Exocarpus	aphyllus			No	1	2.5
Li-06	Leichhardtia	australis			No	<1	Cl
Li-06	Olearia	muelleri			No	<1	0.4
Li-06	Pittosporum	angustifolium			No	1	1-3
Li-06	Ptilotus	obovatus			No	<1	0.4
Li-06	Roepera	eremaea			No	<1	0.5
Li-06	Roepera		sp.	indet	No	0.5	0.2
Li-06	Santalum	acuminatum			No	4	1.5-2.5
Li-06	Scaevola	spinescens			No	3	0.5-1.5
Li-06	Senna	artemisioides	subsp.	filifolia	No	5	1-2.5
Li-06	Solanum	lasiophyllum			No	<1	0.4
Li-06	Solanum	nummularium			No	0.5	0.4
Li-06	Templetonia	incrassata			No	<1	1
Li-06	Vincetoxicum	lineare			No	<1	Cl
Li-07	*Oligocarpus	calendulaceus			No	<1	0.1
Li-07	*Salvia	verbenaca			No	<1	0.15
Li-07	Acacia	acuminata			No	<1	1.5
Li-07	Acacia	hemiteles			No	5	1.5-2.5
Li-07	Amyema	preissii			No	-	-
Li-07	Austrostipa		sp.	indet	No	1	0.5-1
Li-07	Convolvulus	remotus			No	<1	Cl
Li-07	Enneapogon	avenaceus			No	<1	0.15
Li-07	Eremophila	alternifolia			No	-	-
Li-07	Eremophila	caperata			No	<1	0.5-1
Li-07	Eremophila	glabra			No	1	1-1.5
Li-07	Eremophila	interstans	subsp.	interstans	No	<1	3-4
Li-07	Eremophila	parvifolia	subsp.	auricampi	No	<1	0.5
Li-07	Eremophila	scoparia			No	3	2-3
Li-07	Eriochiton	sclerolaenoides			No	<1	0.2
Li-07	Eucalyptus	transcontinentalis			No	-	-
Li-07	Eucalyptus	yilgarnensis			No	-	-
Li-07	Eucalyptus	yilgarnensis			No	4	5-8
Li-07	Exocarpus	aphyllus			No	1.5	2.5
Li-07	Halgania	andromedifolia			No	0.5	0.5-1
Li-07	Leichhardtia	australis			No	-	-
Li-07	Maireana	sedifolia			No	3	0.5-1.5
Li-07	Maireana		cf.	trichoptera	No	<1	0.15
Li-07	Olearia	muelleri			No	<1	0.4
Li-07	Ptilotus	obovatus			No	1	0.4
Li-07	Rhagodia	spinescens			No	<1	0.5-1
Li-07	Roepera		sp.	indet	No	<1	0.1
Li-07	Scaevola	spinescens			No	4.5	0.5-1
Li-07	Sclerolaena	diacantha			No	<1	0.1
Li-07	Senna	artemisioides	subsp.	filifolia	No	4	1-2
Li-07	Solanum	lasiophyllum			No	<1	0.3
Li-08	Acacia	hemiteles			No	2	1.5
Li-08	Austrostipa		sp.	indet	No	0.5	0.5-1
Li-08	Eremophila	caperata			No	3	0.5-3
Li-08	Eucalyptus	griffithsii			No	-	-
Li-08	Eucalyptus	oleosa	subsp.	oleosa	No	-	-
Li-08	Eucalyptus	transcontinentalis			No	6	12
Li-08	Exocarpus	aphyllus			No	<1	1
Li-08	Maireana	sedifolia			No	<1	0.5-1
Li-08	Maireana	tomentosa			No	<1	0.2

Site	Genus	Species	Rank	Name	Significant	% Cover	Height (m)
Li-08	Olearia	muelleri			No	0.5	0.4
Li-08	Pittosporum	angustifolium			No	0.5	1-4
Li-08	Ptilotus	obovatus			No	<1	0.3
Li-08	Scaevola	spinescens			No	1	0.5
Li-08	Senna	artemisioides	subsp.	filifolia	No	0.5	1-2
Li-08	Templetonia	incrassata			No	<1	1.5
Li-09	Acacia	collettioides			No	1	1-2
Li-09	Acacia	hemiteles			No	6	1.5-2.5
Li-09	Alyxia	buxifolia			No	-	-
Li-09	Amyema	preissii			No	<1	Aer par
Li-09	Aristida	contorta			No	<1	0.25
Li-09	Atriplex	vesicaria			No	<1	0.5
Li-09	Austrostipa		sp.	indet	No	0.5	0.5-1
Li-09	Casuarina	pauper			No	-	-
Li-09	Chenopodium	gaudichaudianum			No	-	-
Li-09	Enchylaena	tomentosa			No	<1	0.7
Li-09	Enneapogon	avenaceus			No	1	0.2
Li-09	Enteropogon	ramosus			No	<1	0.3
Li-09	Eremophila	alternifolia			No	2	1.2-3
Li-09	Eremophila	decipiens			No	-	-
Li-09	Eremophila	glabra			No	5	1-2
Li-09	Eremophila	scoparia			No	6	1-3
Li-09	Eriochiton	sclerolaenoides			No	<1	0.2
Li-09	Erodium		sp.	indet	No	<1	0.1
Li-09	Euphorbia	philochalix			No	<1	0.02
Li-09	Exocarpus	aphyllus			No	1	1-2
Li-09	Leichhardtia	australis			No	<1	Cl
Li-09	Maireana	sedifolia			No	-	-
Li-09	Maireana	triptera			No	1.5	0.35
Li-09	Maireana		cf.	trichoptera	No	2	0.2
Li-09	Maireana		sp.	indet	No	<1	0.6
Li-09	Olearia	muelleri			No	<1	0.35
Li-09	Pittosporum	angustifolium			No	<1	2.5
Li-09	Pittosporum	angustifolium			No	-	-
Li-09	Ptilotus	holosericeus			No	<1	0.05
Li-09	Ptilotus	obovatus			No	3.5	0.4
Li-09	Rhagodia	spinescens			No	1	0.5-1
Li-09	Santalum	spicatum			No	-	-
Li-09	Scaevola	spinescens			No	3	0.5-1.3
Li-09	Sclerolaena	obliquicuspis			No	-	-
Li-09	Senna	artemisioides	subsp.	filifolia	No	3	0.5-1.5
Li-09	Solanum	lasiophyllum			No	1	0.4
Li-09	Solanum	nummularium			No	-	-
Li-10	Acacia	hemiteles			No	3	1-2
Li-10	Atriplex	stipitata			No	<1	0.5-1
Li-10	Austrostipa		sp.	indet	No	1	0.5-1
Li-10	Chenopodium	gaudichaudianum			No	<1	0.3
Li-10	Enchylaena	tomentosa			No	<1	0.4
Li-10	Eremophila	oldfieldii	subsp.	angustifolia	No	<1	2-4
Li-10	Eremophila	scoparia			No	10	1.5-3
Li-10	Eriochiton	sclerolaenoides			No	<1	0.2
Li-10	Eucalyptus	griffithsii			No	8	5-8
Li-10	Exocarpus	aphyllus			No	1	2.5
Li-10	Maireana	sedifolia			No	<1	0.5-1
Li-10	Maireana	triptera			No	<1	0.3
Li-10	Maireana		cf.	trichoptera	No	<1	0.2
Li-10	Pittosporum	angustifolium			No	<1	0.5
Li-10	Ptilotus	obovatus			No	2	0.4

Site	Genus	Species	Rank	Name	Significant	% Cover	Height (m)
Li-10	Scaevola	spinescens			No	1	1
Li-10	Sclerolaena	diacantha			No	0.5	0.1
Li-10	Sclerolaena	obliquicuspis			No	<1	0.2
Li-10	Senna	artemisioides	subsp.	filifolia	No	2	0.5-1.5
Li-10	Senna	cardiosperma			No	2	0.5-1.5
Li-10	Solanum	lasiophyllum			No	<1	0.4
Li-10	Solanum	nummularium			No	<1	0.4
Li-10	Templetonia	incrassata			No	<1	1-2
Li-11	Acacia	hemiteles			No	1.5	1-2
Li-11	Austrostipa		sp.	indet	No	0.5	0.5
Li-11	Brachyscome	ciliaris			No	-	-
Li-11	Eremophila	decipiens			No	<1	0.5-1
Li-11	Eremophila	glabra			No	1	1-2.5
Li-11	Eremophila	parvifolia	subsp.	auricampi	No	1	0.5-1
Li-11	Eremophila	scoparia			No	10	1-2.5
Li-11	Eucalyptus	salmonophloia			No	15	8-15
Li-11	Exocarpus	aphyllus			No	0.5	1-2
Li-11	Maireana	sedifolia			No	1	0.5-1
Li-11	Maireana		cf.	trichoptera	No	<1	0.2
Li-11	Olearia	muelleri			No	<1	0.4
Li-11	Ptilotus	obovatus			No	<1	0.4
Li-11	Roepera		sp.	indet	No	<1	0.2
Li-11	Scaevola	spinescens			No	7	0.5-1.3
Li-11	Senna	artemisioides	subsp.	filifolia	No	20	1-2
Li-11	Senna	cardiosperma			No	1	0.5-1
Li-11	Templetonia	incrassata			No	<1	1.2
Li-12	*Carrichtera	annua			No	<1	0.15
Li-12	*Cenchrus	ciliaris			No	<1	0.4
Li-12	*Oligocarpus	calendulaceus			No	<1	0.1
Li-12	*Tribulus	terrestris			No	<1	0.1
Li-12	Acacia	hemiteles			No	<1	1-2.5
Li-12	Atriplex	stipitata			No	3.5	0.3-0.6
Li-12	Austrostipa	elegantissima			No	<1	0.5-1
Li-12	Convolvulus	remotus			No	-	-
Li-12	Dactyloctenium	radulans			No	<1	0.15
Li-12	Enchylaena	tomentosa			No	<1	0.4
Li-12	Enneapogon	avenaceus			No	<1	0.1
Li-12	Eremophila	scoparia			No	2	1-3
Li-12	Eucalyptus	salmonophloia			No	12	12-20
Li-12	Maireana	brevifolia			No	<1	0.4
Li-12	Maireana	suaedifolia			No	<1	0.3
Li-12	Maireana	triptera			No	1	0.4
Li-12	Maireana		cf.	trichoptera	No	<1	0.3
Li-12	Maireana		sp.	indet	No	-	-
Li-12	Myoporum	montanum			No	-	-
Li-12	Olearia	muelleri			No	<1	0.4
Li-12	Panicum	effusum			No	-	-
Li-12	Ptilotus	holosericeus			No	<1	0.05
Li-12	Ptilotus	obovatus			No	<1	0.4
Li-12	Rhagodia	preissii	subsp.	preissii	No	<1	0.6
Li-12	Rhagodia	spinescens			No	<1	0.5-1
Li-12	Roepera	eremaea			No	<1	0.4
Li-12	Roepera		sp.	indet	No	1	0.2
Li-12	Salsola	australis			No	1	0.5
Li-12	Scaevola	spinescens			No	1	0.5
Li-12	Sclerolaena	diacantha			No	0.5	0.2
Li-12	Senna	artemisioides	subsp.	filifolia	No	1	0.5-1
Li-12	Sida	spodochroma			No	-	-

Site	Genus	Species	Rank	Name	Significant	% Cover	Height (m)
Li-13	*Carrichtera	annua			No	<1	0.3
Li-13	*Cenchrus	ciliaris			No	0.5	0.5
Li-13	*Cenchrus	setaceus			No		
Li-13	*Centaurea	melitensis			No	<1	-
Li-13	*Eragrostis	curvula			No	-	-
Li-13	*Gazania	linearis			No	<1	0.2
Li-13	*Oligocarpus	calendulaceus			No	0.5	0.1
Li-13	*Rumex	vesicarius			No	<1	0.4
Li-13	*Sonchus	oleraceus			No	<1	0.5
Li-13	Acacia	hemiteles			No	2	1.5-2.5
Li-13	Atriplex	stipitata			No	1	0.5
Li-13	Austrostipa		sp.	indet	No	<1	0.75
Li-13	Convolvulus	remotus			No	<1	Cl
Li-13	Enchylaena	tomentosa			No	<1	0.5
Li-13	Enneapogon	avenaceus			No	2	0.2
Li-13	Enneapogon	caerulescens			No	-	-
Li-13	Enteropogon	ramosus			No	<1	0.3
Li-13	Eremophila	decipiens			No	2	0.5-1
Li-13	Eremophila	glabra			No	1	1-2
Li-13	Eremophila	oldfieldii	subsp.	angustifolia	No	-	-
Li-13	Eremophila	parvifolia	subsp.	auricampi	No	<1	1
Li-13	Eremophila	scoparia			No	6	1.5-3
Li-13	Eucalyptus	lesouefii			No	3	10
Li-13	Eucalyptus	salubris			No	3	10
Li-13	Euphorbia	philochalix			No	<1	0.02
Li-13	Maireana	sedifolia			No	1.5	1-1.5
Li-13	Maireana	thesioides			No	<1	-
Li-13	Maireana	triptera			No	1.5	0.35
Li-13	Maireana		cf.	trichoptera	No	2	0.3
Li-13	Maireana		sp.	indet	No	0.5	0.6
Li-13	Myoporum	montanum			No	-	-
Li-13	Olearia	muelleri			No	<1	0.4
Li-13	Paspalidium	gracile			No	<1	0.4
Li-13	Ptilotus	exaltatus			No	<1	0.1
Li-13	Ptilotus	obovatus			No	5	0.4
Li-13	Roepera	eremaea			No		
Li-13	Roepera		sp.	indet	No	<1	0.2
Li-13	Salsola	australis			No	<1	0.5
Li-13	Scaevola	spinescens			No	1	0.5-1
Li-13	Sclerolaena	diacantha			No	0.5	0.2
Li-13	Senna	artemisioides	subsp.	filifolia	No	1.5	1-2
Li-13	Sida	calyxhymenia			No	<1	1
Li-13	Solanum	lasiophyllum			No	<1	0.3
Li-13	Taraxis				No		
Li-14	Acacia	acuminata			No	0.5	2.5
Li-14	Acacia	hemiteles			No	1.5	1-2
Li-14	Acacia	tetragonophylla			No	<1	1-2
Li-14	Alectryon	oleifolius			No	-	-
Li-14	Alyxia	buxifolia			No	<1	1.5
Li-14	Amyema	preissii			No	<1	Aer par
Li-14	Austrostipa		sp.	indet	No	-	-
Li-14	Enchylaena	tomentosa			No	<1	0.4
Li-14	Eremophila	decipiens			No	<1	0.4
Li-14	Eremophila	ionantha			No	0.5	1-2.5
Li-14	Eremophila	scoparia			No	<1	1-2
Li-14	Eucalyptus	lesouefii			No	20	8-12
Li-14	Eucalyptus	oleosa	subsp.	oleosa	No	-	-
Li-14	Eucalyptus	salmonophloia			No	4	10-20

Site	Genus	Species	Rank	Name	Significant	% Cover	Height (m)
Li-14	Eucalyptus	transcontinentalis			No	25	10-15
Li-14	Eucalyptus	yilgarnensis			No	-	-
Li-14	Exocarpus	aphyllus			No	-	-
Li-14	Lycium	australe			No	<1	0.4
Li-14	Olearia	muelleri			No	-	-
Li-14	Pittosporum	angustifolium			No	0.5	1-3
Li-14	Scaevola	spinescens			No	-	-
Li-14	Senna	artemisioides	subsp.	filifolia	No	2.5	1-2
Li-14	Templetonia	incrassata			No	-	-
Li-15	Acacia	hemiteles			No	3	1-3
Li-15	Austrostipa	platychaeta			No	<1	0.5-1
Li-15	Eremophila	glabra			No	<1	1.4
Li-15	Eremophila	ionantha			No	8	1-2
Li-15	Eremophila	scoparia			No	1.5	1.5-3
Li-15	Eucalyptus	lesouefii			No	-	-
Li-15	Eucalyptus	salmonophloia			No	35	15-30
Li-15	Exocarpus	aphyllus			No	1	1-2.5
Li-15	Roepera	eremaea			No	<1	0.3
Li-15	Scaevola	spinescens			No	1	0.5-1
Li-15	Senna	artemisioides	subsp.	filifolia	No	3	0.5-2
Li-16	*Urochloa	mosambicensis			No	-	-
Li-16	Acacia	hemiteles			No	5	1-2
Li-16	Atriplex	stipitata			No	<1	0.3
Li-16	Austrostipa		sp.	indet	No	<1	0.5-1
Li-16	Eremophila	caperata			No	2.5	1.5-3.5
Li-16	Eremophila	glabra			No	1	1-2
Li-16	Eremophila	parvifolia	subsp.	auricampi	No	0.5	0.5-1
Li-16	Eremophila	scoparia			No	2	2-3
Li-16	Eucalyptus	griffithsii			No	-	-
Li-16	Eucalyptus	oleosa	subsp.	oleosa	No	15	8-10
Li-16	Eucalyptus	yilgarnensis			No	-	-
Li-16	Maireana	sedifolia			No	<1	0.6
Li-16	Olearia	muelleri			No	0.5	0.5
Li-16	Ptilotus	obovatus			No	<1	0.4
Li-16	Rhagodia	preissii	subsp.	preissii	No	<1	1
Li-16	Scaevola	spinescens			No	4.5	0.5-1.3
Li-16	Sclerolaena	diacantha			No	<1	0.1
Li-16	Senna	artemisioides	subsp.	filifolia	No	3	0.5-2
Li-16	Solanum	nummularium			No	<1	0.5
Li-16	Templetonia	incrassata			No	<1	1-1.5
Li-17	Acacia	hemiteles			No	1.5	1-2
Li-17	Atriplex	stipitata			No	1.5	0.4
Li-17	Eremophila	caperata			No	1	1-3
Li-17	Eremophila	ionantha			No	<1	1.5
Li-17	Eremophila	scoparia			No	1.5	1.5-2.5
Li-17	Eucalyptus	lesouefii			No	2	8-12
Li-17	Eucalyptus	oleosa	subsp.	oleosa	No	-	-
Li-17	Eucalyptus	transcontinentalis			No	7	8-15
Li-17	Maireana		cf.	trichoptera	No	<1	0.15
Li-17	Maireana		sp.	indet	No	<1	0.4
Li-17	Olearia	muelleri			No	0.5	0.4
Li-17	Ptilotus	exaltatus			No	<1	0.1
Li-17	Rhagodia	spinescens			No	<1	0.5
Li-17	Roepera	eremaea			No	<1	0.4
Li-17	Scaevola	spinescens			No	0.5	0.5-1
Li-17	Sclerolaena	diacantha			No	<1	0.1
Li-17	Senna	artemisioides	subsp.	filifolia	No	1.5	1-1.5
Li-18	Acacia	hemiteles			No	1	1-2.5

Site	Genus	Species	Rank	Name	Significant	% Cover	Height (m)
Li-18	Atriplex	stipitata			No	0.5	0.5
Li-18	Austrostipa		sp.	indet	No	<1	0.5-1
Li-18	Eremophila	glabra			No	<1	0.5-1
Li-18	Eremophila	interstans	subsp.	interstans	No	0.5	3-6
Li-18	Eremophila	parvifolia	subsp.	auricampi	No	<1	0.5
Li-18	Eremophila	scoparia			No	2	1.5-3
Li-18	Eucalyptus	transcontinentalis			No	8	10-15
Li-18	Eucalyptus	yilgarnensis			No	5	5-7
Li-18	Exocarpus	aphyllus			No	1	2.5
Li-18	Maireana	sedifolia			No	0.5	0.5-1.5
Li-18	Maireana		cf.	trichoptera	No	<1	0.2
Li-18	Olearia	muelleri			No	0.5	0.4
Li-18	Ptilotus	obovatus			No	<1	0.4
Li-18	Roepera		sp.	indet	No	<1	0.15
Li-18	Scaevola	spinescens			No	2	0.5-1
Li-18	Senna	artemisioides	subsp.	filifolia	No	7	1-2
Li-18	Templetonia	incrassata			No	<1	1-1.5

Representative Photos

Li-01



Li-02



Li-03



Li-04



Li-05



Li-06



Li-07



Li-08



Li-09



Li-10



Li-11



Li-12



Li-13



Li-14



Li-15



Li-16



Li-17



Li-18

