FLORA AND VEGETATION SURVEY

of the

Menzies Project

Prepared for

Australian Mineral Partners Pty. Ltd.



Prepared by

Goldfields Landcare Services

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TABLE OF CONTENTS

Page

1. SUMMARY……..4

2. INTRODUCTION……4

2.1 Location
2.2 Climate
2.3 Land Systems
2.4 Vegetation
2.5 Rare and Priority Flora
2.6 Threatened Flora Species and Ecological Communities

3. OBJECTIVES…….....10

4. METHODS ……...13

5. RESULTS……..16

5.1 Flora
5.2 Conservation Status of the Flora
5.3 Vegetation
5.4 Rehabilitated Mine Waste Dump
5.5 Condition of the Plant Communities

6. DISCUSSION……....31

7. RECOMMENDATIONS……32

8. LIST OF PARTICIPANTS……..32

9. REFERENCES……..33

PLATES

Plate 1: Stony Ironstone Mulga Shrubland……..20

Plate 2: Stony Plain Acacia-Eremophila Shrubland in Laverton Land System.....21

Plate 3 Stony Plain Acacia –Eremophila Shrubland in Rainbow Land System.....22

Plate 4 Stony Plain Acacia –Eremophila Shrubland in Windarra Land System.....23

Plate 5: Drainage Tract Mulga Shrubland……...24

Plate 6: Sandplain Acacia Shrubland.....25

Plate 7: Granny Venn Waste Dump looking SW from 31555 m E; 6716840 m S 28

Plate 8: Granny Venn Waste Dump looking NW from 31555 m E; 6716840 m S.....29

TABLE OF CONTENTS (continued)

Plate 9: Granny Venn Waste Dump looking NE from 31555 m E; 6716840 m S.....29

Plate 10: Granny Venn Waste Dump looking SE from 31555 m E; 6716840 m S.....30

TABLES

Table 1: TEC and PEC nearest the survey area.....11

Table 2: Survey Limitations.....14

FIGURES

Map 1: Location Map.....5

Map 2: Modified Extract from Geoscience Australia 1: 250 000 Menzies Topographical Map.....6

Map 3: Tenement Boundaries.....7

Map 4: Caesar Project Vegetation Map.....19

APPENDICES

A1**:** Conservation Codes for Western Australian Flora and Fauna (Department of Parks and Wildlife, 2015)

A2: Definition of Threatened Flora Species (Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth))

A3**:** Definitions and Criteria of Threatened Ecological Communities (Department of Environment and Conservation 2013)

A4: Definitions and Criteria for Priority Ecological Communities (Department of Environment and Conservation 2013)

B: Vegetation Condition Scale (Kieghery 1994)

C: Vegetation Classification System (Modified Muir 1977)

D: Species of Conservation Significance recorded from NatureMap Species Report. (July 2016)

E: Species of Conservation Significance recorded from CALM and W A Herbarium searches commissioned by Paddington Gold P.L. (Dec.1998)

F: Plant Species List by Vegetation Type.

G: Fauna Observations by Vegetation Type.

1. SUMMARY

Goldfields Landcare Services was contracted by Australian Mineral Partners Pty. Ltd. (AMP) to conduct a Level 1 Flora and Vegetation Survey on an area of approximately 1250 Ha located on Jeedamya Pastoral Station approximately 6.5 kilometres northeast of Menzies W. A.

The survey area incorporates a number of active mining and prospecting tenements which are held by AMP, the principal of which is M 29/189. Investigations by AMP have identified a cluster of small open cut gold resources in M 29/189 which occupy ground within and in between former open cut mines "Granny Venn" and "Auntie Nellie". This includes remnant ore left behind in the "Granny Venn" and "Auntie Nellie" pits, together with a new resource identified within the bridge that separates these two excavations which is known as Caesar.

The survey was carried out on the 9th and 10th of September 2016.

One hundred and fourteen vascular plant species have been recorded from within the survey area. The most prevalent families recorded were Fabaceae and Chenopodiaceae.

No plant species gazetted as "Declared Rare Flora" pursuant to subsection (2) of section 23F of the *Wildlife Conservation Act 1950* (W. A.) and no plant species listed as "Threatened" under the Environment Protection and Biodiversity Conservation act 1999 (Department of Sustainability, Water, Population and Community) have been recorded within the surveyed areas.

No plant species of conservation significance were recorded within the survey areas.

Seven non native introduced species were recorded within the survey areas.

No species listed as Declared by the Department of Agriculture and Food W.A. (2009) were recorded within the survey area.

Four vegetation types were recorded and described within the survey areas.

The vegetation condition of the surveyed areas was assessed as being "Good" based on Keighery's 1994 "Vegetation Condition Scale" (Appendix B).

2. INTRODUCTION

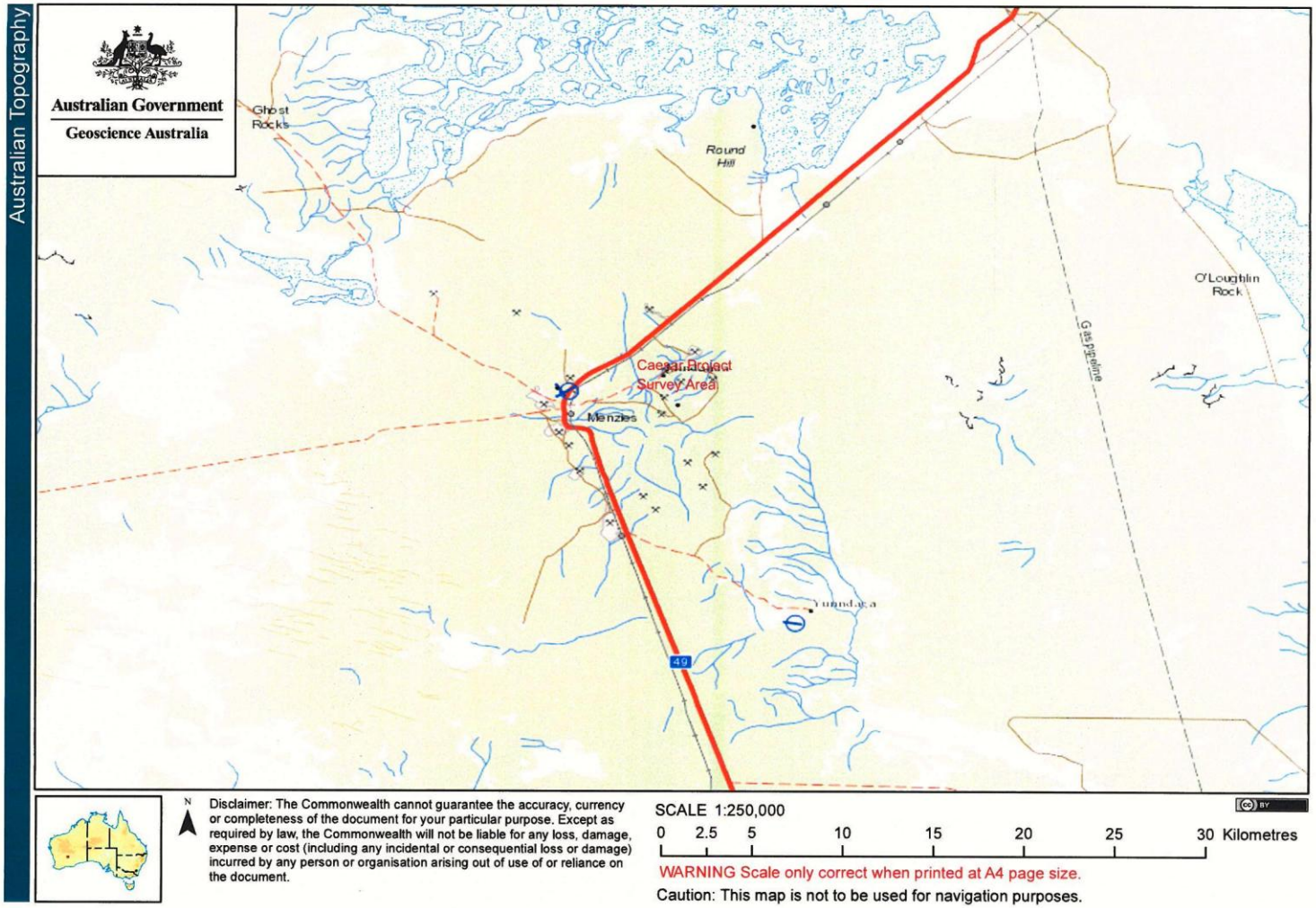
2.1 Location

The roughly circular survey area had a radius of approximately two kilometres and an area of approximately 12.56 square kilometres.

It was centred approximately halfway between two existing open pits named "Granny Venn" and" Auntie Nellie" that were mined by Paddington Gold Pty Ltd. in 1999 and lie approximately 6.5 kilometres north east of Menzies W.A. (Map 1)

The survey area covers portions of Mining Leases M 29/189, M 29/141 and M29/164 and Prospecting Leases P 29/2168, P 29/2242, P 29/2243, P 29/2244, P 29/2245, P29/2246, P29/2247, P29/2391 and P 29/2395. The locations of which are shown in Map 3

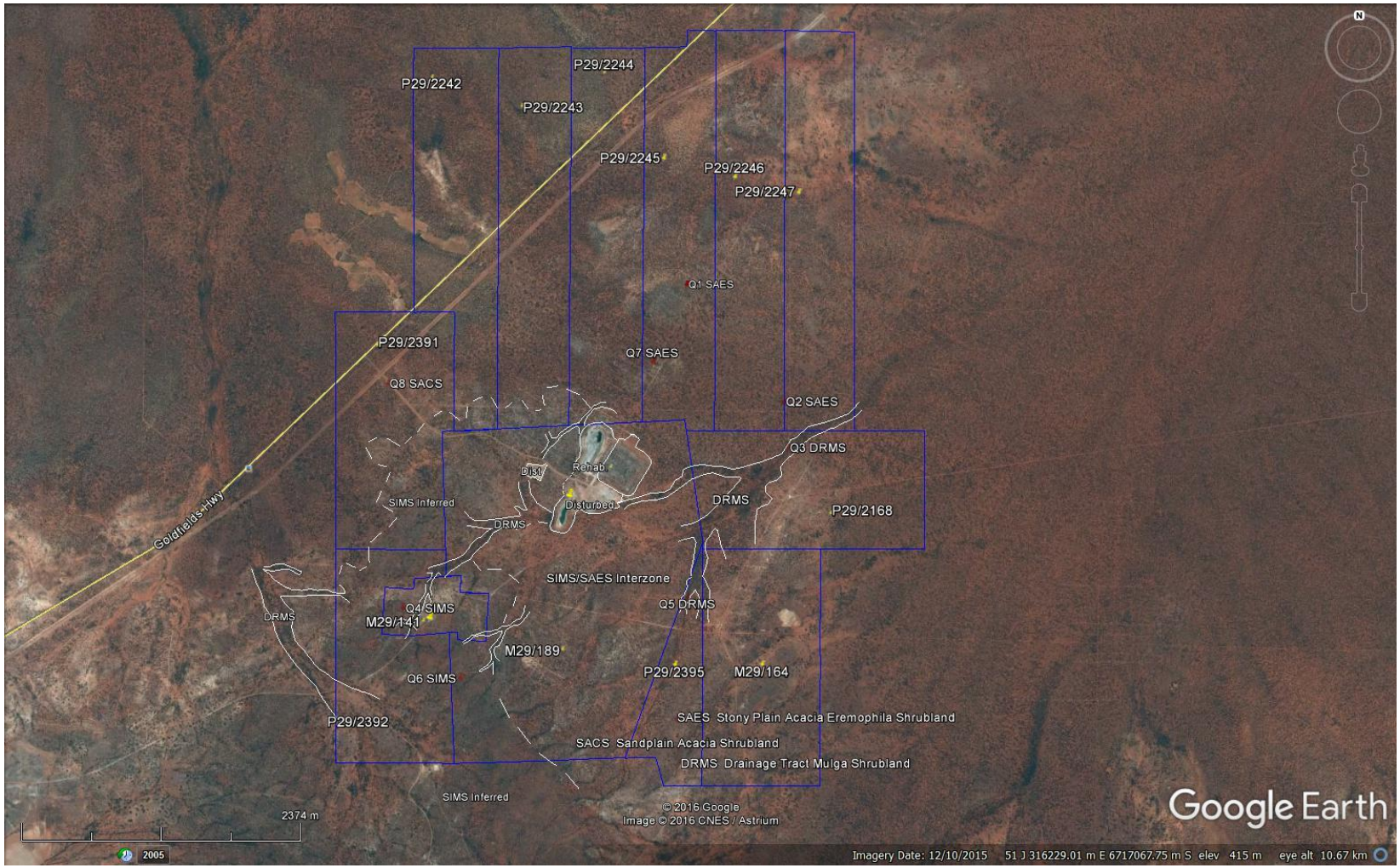
Map 1: Location Map



Map 2: Modified Extract from Geoscience Australia 1: 250 000 Menzies Topographical Map.



Map 3: Tenement boundaries.



2.2 Climate

Beard described the climate of the Murchison Region (Austin Botanical District) in Plant Life of Western Australia, within which the survey area lies, as "Arid with summer and winter rain; precipitation 200 mm per annum". (Beard 1990, p. 186)

The nearest Bureau of Meteorology weather station is located at Menzies which lies approximately seven kilometres to the south west of the survey area.

Records from the station for the104 years 1898-2016 show that the mean annual rainfall is 254 mm with the majority normally falling between January and June. However, the station has recorded 235.3 mm in the first seven months of this year, which is 32% greater that the long term mean for that period.

For the 94 years from 1898-1996 the mean annual maximum temperature was 26.3° C and the mean annual minimum temperature was 12.6° C (Bureau of Meteorology 2016)

2.3Land Systems

The surveyed areas lie within the Eastern Murchison (MUR 01) sub region of the Murchison (MUR) region as classified under the Interim Biogeographic Regionalisation of Australia (IBRA) Version 7.

In the WA Department of Agriculture's Technical Bulletin No 87 An inventory and condition survey of the north eastern Goldfields, Western Australia, authors H Pringle et.al. describe land systems according to their topography, soils and vegetation.

The area surveyed covers five different land systems defined in Bulletin 87 as:

"Laverton" Land System: "Greenstone hills and ridges with Acacia shrublands."

"Rainbow" Land System: "Level to very gently inclined wash plains."

"Moriaty" Land System: "Gently undulating plains with stony mantles, low rises with limonite and alluvial plains."

"**Marmion" Land System:**"Extensive gently undulating sand plains (mixed spinifex, acacia, heath and mallees.)."

"Windarra" Land System:"Stony plains with quartz mantles, supporting acacia-eremophila shrublands."

2.4 Vegetation

Four different vegetation types defined in Technical Bulletin No 87 were identified in the survey area:

Stony ironstone mulga shrublands.

Stony plain acacia-eremophila shrublands.

Drainage tract mulga shrublands.

Sandplain acacia shrublands.

Beard describes the vegetation of the Murchison Botanical District, within which this survey area lies, as: "Predominantly mulga low woodland (*Acacia aneura*) on plains, reduced to scrub on hills. Tree steppe of *Eucalyptus* spp. and *Triodia basedowii* on sand plains." (Beard, 1990 p 186)

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2.5 Rare and Priority Flora

In WA, under the *Wildlife Conservation Act 1950* all plants are protected. Some, which are under threat of extinction, are classified as Threatened Species. Others which are either under consideration to be declared as Threatened Species or still require monitoring are classified as Priority Flora species. The definitions of the five different classifications of Priority Species and that of Threatened Species and Presumed Extinct Species are shown in Appendix A1.

2.6 Threatened Flora Species and Ecological Communities

Listed threatened species and ecological communities are recognized as a matter of national environmental significance. Consequently, any action that is likely to have a significant impact on listed threatened species and ecological communities under the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) must be referred to the Minister and undergo an environmental assessment and approval process. (Department of Sustainability, Water, Population and Community). The different categories of threatened species and threatened ecological communities and their respective definitions are shown in Appendices A2 and A3.

3 OBJECTIVES

Goldfields Landcare Services was contracted by Australian Mineral Partners Pty. Ltd. to conduct a Level 1 Flora and Vegetation Survey on an area of approximately 1250 Ha covering portions of Mining Leases M 29/189, M 29/141 and M29/2395 and Prospecting Leases P 29/2168, P 29/2242, P 29/2243, P 29/2244, P 29/2245, P29/2246, P29/2247, P29/2391 and P 29/2395. The locations of which are shown in Map 3

The survey area is located approximately 6.5 kilometres northeast of Menzies on Jeedamya Station.

The centre of the survey area was located at 51J 315141 m E; 6716609 m S

A Preliminary Fauna Assessment was carried out as an adjunct to and in conjunction with the Flora and Vegetation survey.

The Flora and Vegetation survey was conducted on EPA Guidance Statement No 51 guidelines while the Fauna assessment was done via visual records and photographs only and did not involve any trapping or handling.

3.1 Background research

The purpose is to gather background information on the target area (usually at the locality scale). This involves a search of all sources of literature, data and map based information.

One relevant Notice of Intent to develop an open pit compiled for Paddington Gold in 1998 was located via the W.A. Department of Mines and Petroleum's online system, Mindex. Although it did not contain all the results of the vegetation survey that was done at the time, the search records for threatened and priority plant species were included.

These searches were conducted by the then Department of Conservation and Land Management in December 1998 on their Threatened (Declared Rare) Flora database, their Priority Species List and the Western Australian Herbarium Specimen database and covered an area of approximately 3670 square kilometres.

No species of Declared Rare Flora had been recorded within the search area at that time however 16 plant species classified as Priority species were recorded.

The Department of Conservation and Land Management's Priority species list contained ten species and the WA Herbarium's specimen database contained

eleven, however five species occurred in both searches resulting in a total of 16 Priority species being recorded. Three of these species have since had their priority classification downgraded and are no longer considered to be Priority species.

A NatureMap Species Report was created on 26.07.2016 covering an area with a 20 km radius from the centre of the survey area which revealed a total of seven priority plant species occurring within it, six of which also occurred in the aforementioned searches resulting in a total of 14 Priority species identified from three searches, potentially occurring in the area.

One of the plant species was listed as Priority 1: *Ptilotus chortophytum*.

Five of the plant species were listed as Priority 2: *Beyeria similis*, *Malleostemon sp. Adelong (G.J Keighery11825)*, *Newcastelia insignis*, *Eremophila mirabilis* and *Thryptomene eremaea.*

Six plant species were listed as Priority three: *Grevillea subterlineata Calytrix praecipua Gunniopsis propinqua*, *Micromyrtus serrulata Philotheca desertii* subsp. *brevifolia* and *Philotheca coateana.*

Two species was listed as Priority four: *Grevillea erectiloba* and *Eucalyptus jutsonii.*

One bird species, the Malleefowl (*Leipoa ocellata*) which is classified as "Rare or likely to become extinct ", was the only other taxon in the NatureMap Species Report regarded as a priority species possibly occurring within that area.

A search on DPaW's list Of Threatened Ecological Communities (TEC) revealed that the nearest Threatened Ecological Community is at Depot Springs which is located approximately 230 kilometres north west of the survey area.

DPaW's list of Priority Ecological Communities (PEC) shows the nearest PEC is located on Melita Station approximately 40 kilometres north of the survey area.

Table 1. TEC and PEC nearest the survey area

Depot Springs Stygofauna community (TEC)	Vulnerable (B)
Melita calcrete groundwater assemblage type on Raeside paleodrainage on Melita Station.(PEC)	P1

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3.2 Reconnaissance survey

The purposes of a Level 1 Flora and Vegetation Survey are:

i) to verify the accuracy of the background study;

ii) to further delineate and characterize the flora and the range of vegetation units present in the target area; and

iii) to identify potential impacts.

This involves a target area visit by suitably qualified personnel to undertake selective, low intensity sampling of the flora and vegetation, and to produce maps of vegetation units and vegetation condition at an appropriate scale. (Environmental Protection Authority Guidance Statement 51, 2004)

4 METHODS

A site reconnaissance trip was undertaken on the sixth of August 2016 to assess the terrain and accessibility of the proposed survey area and the validity of the photo interpretations made from the Google Earth image of the area.

Land Systems and associated Landform units were identified from the WA Department of Agriculture's Technical Bulletin No 87 "An inventory and condition survey of the north-eastern Goldfields, Western Australia" and accompanying 1:250 000 Land System map. Vegetation Types were interpreted from quadrat surveys and defined on a Google Earth image.

The survey area is covered with a network of existing tracks and grid lines which were accessible by 4WD vehicle. Traverses were also conducted on foot within the survey areas. A total of 37.6 kilometres was traversed.

Eight quadrat surveys were conducted within the survey area.

Each 25m x 25m quadrat survey recorded descriptions of: Landscape; Surface; Rock Type; Soils; Overall Vegetation Type; Fire Age; Condition/Disturbances; Vegetation Stratum Height, Total Percentage Cover and Dominant Species from which a vegetation description was deduced using the Vegetation Classification System shown at Appendix C. A list of species together with their height and percentage cover was also recorded.

Plant species were recorded or sampled and locations were recorded using a Garmin GPSmap76csx device. Photographs were taken in each of the four cardinal directions and the ground from the centre of the quadrat +/- 2m. Opportunistic samples, notes, photographs and GPS coordinates were also taken to aid the mapping and reporting.

Specimens collected in the field were subsequently identified using appropriate text references, plant keys and web sites and by comparison with specimens collected during previous surveys**.**

The Preliminary Fauna Assessment was made by recording sightings of all animals, birds, reptiles, spiders, tracks, scats, nests and burrows observed in the course of conducting the vegetation survey with photographs where possible and limited audio recording of birds. A night time spot light walk was also undertaken as well as dawn and dusk recordings. No specimens were collected and sightings not immediately recognised were subsequently identified using appropriate text references and web based sources where possible.

4.1 Definitions of Survey Limitations

According to the EPA Guidance Statement No. 51 for Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (2004), flora and vegetation surveys may be limited by the following:

- sources of information and availability of contextual information (i.e. pre-existing background versus new material);
- the scope (i.e. what life forms, etc., were sampled);
- Proportion of flora collected and identified (based on sampling, timing and intensity);
- completeness and further work which might be needed (e.g. was the relevant area fully surveyed);
- mapping reliability;
- timing, weather, season, cycle;
- disturbances (fire, flood, accidental human intervention etc.);
- intensity (in retrospect, was the intensity adequate);
- resources;
- access problems; and
- experience levels (e.g. degree of expertise in plant identification to taxon level).

An assessment of these aspects is detailed in the table below:

4.2 Survey Limitations

TABLE 2: Survey Limitations

ASPECT	CONSTRAINT	COMMENT
Sources and availability of contextual information	No	DAWA Technical Bulletin 87 (1994) provides extensive reference material for this region. One relevant Notice of Intent to Mine was located.
Scope	No	The survey was detailed and covered all aspects of flora and vegetation assessment and recorded fauna observations.
Proportion of flora collected and identified	No	Traverses covered the four main vegetation types encountered. Sampling was detailed and identification to species level was > 99%
Completeness	No	.Eight quadrat surveys and extensive foot and vehicle traverses deemed sufficient.
Mapping reliability	No	Detail considered adequate for this level of survey in this region.
Timing	No	Early spring weather provided optimum conditions.
Disturbances	No	No impediments encountered..
Intensity	No	Greater survey intensity would be required to define more detailed mapping.
Resources	No	Resources were adequate with four person days devoted to botanical survey work.
Access Problems	No	Survey areas accessible by foot and four wheel drive vehicle.
Experience Levels	No	Personnel have extensive field experience in the eastern and north eastern goldfields.

5 RESULTS

5.1 Flora

Eight quadrats, each 25m x 25m were surveyed within an area of approximately 12.5 square kilometres.

A total of 81 separate plant specimens (including duplicates) were collected from within the survey areas.

One hundred and fourteen different species, including sub species and varieties have been identified from 33 families and 67 genera.

The most abundant genera were *Acacia* with 14 species followed by *Eremophila* with nine.

A complete list of species recorded is shown in the attached Appendix E.

Seven non native, introduced species were recorded within the survey area.

No species listed in the DPaW Declared Rare and Priority Flora List and the Nature Map Species Report were encountered within the survey area.

5.2 Fauna

37.6 kilometres were traversed by foot and vehicle within the survey area on 06.08.16 and from 09.09.16 to 11.09.16.

Fauna sightings were recorded, the location noted and photographs taken where possible.

One Red Kangaroo was sighted, one Rabbit, one Dragon Lizard and one Wolf Spider.

Twenty species of birds were identified by sight and /or call.

One Rabbit warren and numerous active dung heaps were seen.

An old dog scat, Emu tracks and old cow and camel dung and tracks were also seen.

A list of fauna related observations is shown at Appendix G.

5.2 Conservation Status of the Flora

No plant species gazetted as Declared Rare Flora pursuant to subsection (2) of section 23F of the *Wildlife Conservation Act 1950* (WA), and no plant species listed as Threatened pursuant to the List of Threatened Flora of the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) (Department of Sustainability, Water, Population and Communities) were recorded from within the survey area.
A search was carried out of the DPaW's Threatened and Priority Ecological Communities database and revealed that there are no known occurrences of Threatened Ecological Communities (TEC's) recorded in the vicinity with the closest being in the area of Depot Springs approximately 230 kilometres north west of the survey area.

The list of Priority Ecological Communities (PEC's) was viewed online in the DPaW's database with the nearest recorded located approximately 40 kilometres north of the survey area.

No TEC's or PEC's were encountered during the survey.

5.3 Vegetation

Four different vegetation types defined in Technical Bulletin No 87 were identified from within the five different Land Systems encountered.

Variations in species composition between quadrats determined to be of the same vegetation type reflect the possibility of a particular vegetation type occurring in different land systems with different geology and thereby exhibiting variations in vegetative characteristics.

In this survey, the vegetation type described as Stony Plain Acacia-Eremophila Shrublands occurs at Quadrat number one (51J 316077 m E; 6718305 m S) in the Laverton Land System, on a stony plain below greenstone hills, while at Quadrat number two (51J 316922 m E; 6717326 m S) it occurs on an alluvial plain with quartz and ironstone pebbles in the Rainbow Land System and at quadrat number seven (51J 315800 m E; 6717633 m S) it occurs in the Windarra Land System with minor granite outcrops. Comprehensive vegetation descriptions for each of these quadrats are included under Vegetation Type Descriptions.

The vegetation types identified and mapped as shown in Map No 3 are described in Bulletin No 87 as follows:

- **Stony Ironstone Mulga Shrublands (SIMS)**

  SIMS occurs on the hillslopes and low rises within greenstone belts and often has a heavy stony mantle in which rocks which have been indurated by iron are common. Soils are generally shallow red earths on greenstone or basalts.

- **Stony Plain Acacia –Eremophila Shrublands (SAES)**

  SAES occurs on stony plains below a variety of types of hills and rises, including banded ironstone, quartz, basalt, greenstones and felsic intrusive and extrusives but most extensively below granites. Soils are generally shallow (<60 cm) red earths or occasionally sand on rock; sometimes the rock has a veneer of hardpan in lower areas subject to sheet flow.

- **Drainage Tract Mulga Shrublands (DRMS)**

  DRMS occurs on generally narrow (<200 m wide) unincised linear drainage zones receiving concentrated run-on. These narrow drainage zones are most extensive on hardpan plains but often occur further upslope on pediments. Soils, usually deeper (> 1 m) and heavier textured than adjacent plains, are generally underlain by hardpan at depth.

- **Sandplain Acacia Shrubland (SACS)**

  SACS is widely distributed and most prominent in the sandplains south of Lake Ballard, Lake Marmion, and Lake Lefroy. Soils are generally deep earthy red sands and occasionally deep red earths.

5.4 Rehabilitated Mine Waste Dump

In addition to the vegetation types described above, a rehabilitated waste rock dump, approximately 12.25 Ha in area was surveyed. From information contained in the NOI lodged by Paddington Gold P. L., it appears that the rehabilitation work was completed about 16 years ago. From current observations the rehabilitation work appears to have consisted of applying topsoil to the waste rock surface, ripping and then broadcasting seeds of native plants.

The resultant plant species density and composition varied considerably within the rehabilitated area and if assessed against the Vegetation Classification System

shown in Appendix C, the canopy cover types would range from Dense Low Forest A to Sparse Dwarf Scrub, depending on which parts of the rehabilitated area the assessments were made. For this reason it was considered that a representative vegetation description could not be deduced for the rehabilitated area by using the conventional assessment criteria, therefore a foot traverse over the area rather than quadrat surveys was deemed a more appropriate survey technique.

The traverse revealed the forty six different plant species shown in Appendix F and the observation that the area hosted a relatively diverse and abundant bird population when compared to the surrounding areas. It was also obvious from tracks on the north slope of the dump that grazing by cattle and kangaroos had occurred and by the presence of fresh rabbit dung and heavily chewed grass butts across the slope and top of the dump, that rabbits were currently active.

It is to be expected that as more species reach seed bearing age, particularly the Eucalyptus sp. and renowned coloniser species such as Senna artemisioides, Acacia jennerae and the Atriplex and Maireana sp, that those areas which are currently sparsely vegetated will support a greater density of plants. Although it is a young and evolving ecosystem it currently appears to meet the intended establishment criteria of being diverse and stable (Paddington Gold N.O. I. 4.9.1)

In order to provide a more objective benchmark against which to measure future condition assessments, a generalised vegetation type description has been formulated by broadening the parameters used to measure canopy cover and form/height shown in the Vegetation Classification System Appendix C. This is detailed with representative photos under the section titled Vegetation Type Descriptions found below.

The survey of the waste rock dump resulted in 47 plant species identified. Thirty one of these occurred elsewhere in the surrounding area. The remaining 16 which were not encountered in the surrounding area are nevertheless indigenous to the Goldfields region. These species are listed in Appendix E.

MAP 3: Caesar Project Vegetation Map



VEGETATION TYPE DESCRIPTIONS



Plate 1: Stony Ironstone Mulga Shrubland (SIMS)

At quadrat number four (51J 313715 m E; 6715526 m S) the vegetation was described as *Casuarina pauper* open low woodland B (Projected Foliar Cover 2-10%; <5 m) over mixed *Acacia* open scrub (PFC 2-10%; > 2m) including *Acacia ligulata*, *A.curvaneura*, and *A. kempeana* over mixed open low scrub (PFC 2-10%; 1-2m) of *Eremophila latrobei* subsp. *latrobei, Senna artemisioides* subsp *filifolia*, *S. artemisioides* subsp. *helmsii, Acacia tetragonophylla, Dodonaea lobulata, Scaevola spinescens, Sida calyxhymenia* and *Philotheca brucei*; over open dwarf scrub (PFC 2-10%; <1) containing *Ptilotus obovatus, Enchylaena tomentosa, Rhagodia drummondii, Maireana georgei* and *Solanum lasiophyllum* on orange/brown silt with Greenstone scree.



Plate 2: Stony Plain Acacia – Eremophila Shrubland (SAES) in Laverton Land System.

At quadrat number one (51J 316077 m E; 6718305 m S) the vegetation was described as *Acacia kempeana, A. ramulosa* var. *ramulosa, A caesaneura* scrub (PFC 10-30% > 2m) over open low scrub of *Senna artemisioides* subsp. *filifolia, S. artemisioides* subsp. x *coriaceae, Sida calyxhymenia, Dodonaea lobulata* and *Acacia tetragonophylla* (PFC 2-10% 1-2 m) over open dwarf scrub of *Maireana glomerifolia, M. pyramidata, Enchylaena tomentosa, Acacia ramulosa* var. *ramulosa, Ptilotus obovatus, Solanum lasiophyllum, Sclerolaena diacantha, S. densiflora* and *Austrostipa elegans* on orange / brown silty loam with quartzite cobbles and pebbles with some minor outcropping.



Plate 3: Stony Plain Acacia –Eremophila Shrubland (SAES) in Rainbow Land System

At quadrat number two (51J 316922 m E; 6717326 m S) the vegetation was described as *Acacia caesaneura* scrub (PFC 10-30% > 2m) with scattered *Grevillea berryana* and emergent *Eucalyptus oleosa* to 8m over mixed open low scrub (PFC 2-10%; 1-2m) of *Senna artemisioides* subsp. *filifolia*, *Acacia tetragonophylla*, *Dodonaea rigida*, *Eremophila eriocalyx* and *Scaevola spinescens* over mixed open dwarf scrub (PFC 2-10% <1m) of *Eremophila clarkei*, *Spartothamnella teucriflora*, *Enchylaena tomentosa*, *Ptilotus obovatus*, and *Solanum lasiophyllum*, on orange silty loam with quartz and ironstone pebbles.



Plate 4 Stony Plain Acacia – Eremophila shrubland (SAES) in Windarra Land System

At quadrat number seven (51J 315800 m E; 6717633 m S) the vegetation was described as *Acacia incurvaneura* scrub (PFC 10-30% >2m) with scattered emergent *Callitris preissii* over open scrub (PFC 2-10% >2m) of *Acacia ramulosa* var. *ramulosa* and *Grevillea berryana* over open low scrub (PFC 2-10% 1-2m) of *Acacia incurvaneura*, *A. tetragonophylla, Senna artemisioides* subsp. *filifolia*, *S. artemisioides* subsp. x *coriaceae, Dodonaea rigida, Scaevola spinescens, Prostanthera althoferi* and *Eremophila latrobei* subsp. *latrobei* over mixed open dwarf scrub (PFC 2-10% <1m) of *Eremophila latrobei* subsp. *latrobei, E. clarkei, Philotheca brucei, Prostanthera althoferi, Callitris preissii, Acacia incurvaneura.* and *A. ramulosa* var *ramulosa* over scattered grasses (PFC <2%) on orange sandy silt with minor outcropping granite.



Plate 5: Drainage Tract Mulga Shrubland (DRMS)

At quadrat number three (51J 316961 m E; 6716937 m S) the vegetation was described as *Acacia caesaneura* thicket (PFC 30-70% >2m) with scattered emergent *Eucalyptus oleosa* to 6m over open low scrub (PFC 2-10% >2m) of *Acacia tetragonophylla*, and *A ramulosa* var. *ramulosa* over mixed open dwarf scrub (PFC 2-10% <1m) of *Acacia tetragonophylla*, *A. ramulosa* var *ramulosa*, *Abutilon otocarpum*, *Senna artemisioides* subsp. x *coriaceae*, *Sida calyxhymenia*, *Eremophila clarkei*, and *Ptilotus obovatus* over very mixed scattered herbs and annuals (PFC <2%) containing *Menkea australis*, *Lemooria burkittii*, *Haloragus trigonocarpa*, *Hydrocotyle medicaginoides* and *Cheilanthes sieberi* on orange/brown, sandy silt.



Plate 6: Sandplain Acacia Shrubland (SACS)

At quadrat number eight (51J 313554 m E; 6717423 m S) the vegetation was described as *Acacia caesaneura* scrub (PFC 10-30% >2 m) over *Eucalyptus leptopoda* very open shrub mallee (PFC 2-10%) over *Acacia ramulosa* var. *ramulosa* scrub (PFC 10-30% >2 m) with scattered *Acacia caesaneura* and *A. tetragonophylla* (PFC <2% >2m) over mixed sparse low scrub (PFC 10-30% 1-2 m) of *Eremophila clarkei*, *Dodonaea rigida*, *Scaevola spinescens*, *Senna artemisioides* subsp. x *coriaceae*, and *Sida calyxhymenia* over mixed scattered low shrubs and ephemerals (PFC <2% <1 m) containing *Ptilotus obovatus*, *Solanum lasiophyllum*, *Trachymene ornata*, *Brachyscome iberidifolia* and *Cheilanthes sieberi* on alluvial orange/brown silt.

Rehabilitated Mine Waste Dump

The assessment was made from the top of the dump at 315555 m E; 6716840 m S and was described as *Eucalyptus oleosa, E. clelandii* Low Forest A to Open Low Woodland A (PFC 2-30%, <5-15m) over mixed scrub to mixed open low scrub of *Acacia* spp. *Senna* spp, *Dodonaea lobulata, D. Rigida* and *Sida calyxhymenia* (PFC 2-30%, 1- >2m) over open dwarf scrub to dwarf scrub (PFC 2-30%, <1m) of *Ptilotus exultatus, P. Obovatus, Atriplex bunburyana, A. codonocarpa* and *Maireana* spp on ripped mine waste rock and imported topsoil.

The photographs below were taken from the top of the dump at the coordinates shown.



Plate 7: Granny Venn Waste Dump looking SW from 31555 m E; 6716840 m S



Plate 8: Granny Venn Waste Dump looking NW from 31555 m E; 6716840 m S



Plate 9: Granny Venn Waste Dump looking NE from 31555 m E; 6716840 m S



Plate 10: Granny Venn Waste Dump looking SE from 31555 m E; 6716840 m S

5.5 Condition of the Plant Communities

Based on the vegetation condition scale compiled by Kieghery (1994) (Appendix B) the condition of the vegetation within the areas surveyed was considered to be "Good".

6. DISCUSSION

A total of 114 species (including sub-species and varieties) from 33 families and 67 genera were recorded in the survey area. The most prevalent families recorded were *Fabaceae* and *Chenopodiaceae* each with 19 species (Appendix E).

In the area surveyed:

- No plant species gazetted as Threatened or Declared Rare Flora pursuant to subsection (2) of section 23F of the *Wildlife Conservation Act 1950* (WA) were recorded.

- No plant species listed as Threatened pursuant to Schedule 1 of the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth) (Department of Sustainability, Water, Population and Community) were recorded.

- No species listed as Declared by the Department of Agriculture and Food (2009) were recorded.

- No species listed as Priority species by the Department of Conservation and Land Management (2016) were recorded.

- No Threatened Ecological Communities listed by the Department of Conservation and Land Management (2016) were recorded.

- No Priority Ecological Communities listed by the Department of Conservation and Land Management (2016) were recorded.

- No Threatened Ecological Communities listed by the Department of Sustainability, Water, Population and Community (2012) were identified.

7. RECOMMENDATIONS

The following recommendations are made to protect and enhance the conservation and botanical values in the Caesar project area:

- Ground disturbance and clearing of vegetation should be limited to that which is essential for the development of the project.
- Consideration should be given to the possibility of harvesting seed for future revegetation work prior to any clearing being carried out.
- Retain and stockpile cleared vegetation for use in the later rehabilitation of disturbed areas.
- Maintain existing drainage systems, e.g. do not allow roads etc. to disrupt or divert historic flow patterns.
- Apply weed control measures.

8. PARTICIPANTS

Mr Phil Stanley Dip Cart; Dip Hort and Ms Paula Pavlovic BA, MA of Goldfields Landcare Services carried out the survey work, plant identification, mapping and report preparation for this project. Licenses for Scientific or Other Prescribed Purposes Numbers: SL011778 and SL011779.

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Appendix A1: Conservation Codes for Western Australian Flora and Fauna (Department of Parks and Wildlife, 2015)

Specially protected fauna and flora Code	Description
T	**Threatened species** Published as Specially Protected under the Wildlife Conservation Act 1950, and listed under Schedules 1 to 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora (which may also be referred to as Declared Rare Flora). Threatened fauna is that subset of 'Specially Protected Fauna' declared to be 'likely to become extinct' pursuant to section 14(4) of the Wildlife Conservation Act. Threatened flora is flora that has been declared to be 'likely to become extinct or is rare, or otherwise in need of special protection', pursuant to section 23F(2) of the Wildlife Conservation Act. The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.
CR	**Critically endangered species** Threatened species considered to be facing an extremely high risk of extinction in the wild. Published as Specially Protected under the Wildlife Conservation Act 1950, in Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.
EN	**Endangered species** Threatened species considered to be facing a very high risk of extinction in the wild. Published as Specially Protected under the Wildlife Conservation Act 1950, in Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.
VU	**Vulnerable species** Threatened species considered to be facing a high risk of extinction in the wild. Published as Specially Protected under the Wildlife Conservation Act 1950, in Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.
EX	**Presumed extinct species** Species which have been adequately searched for and there is no reasonable doubt that the last individual has died. Published as Specially Protected under the Wildlife Conservation Act 1950, in Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora.

Appendix A1: Conservation Codes for Western Australian Flora and Fauna (Department of Parks and Wildlife, 2015) *continued*

Specially protected fauna and flora Code	Description
IA	**Migratory birds protected under an international agreement** Birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds. Published as Specially Protected under the Wildlife Conservation Act 1950, in Schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice.
CD	**Conservation dependent fauna** Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened. Published as Specially Protected under the Wildlife Conservation Act 1950, in Schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice.
OS	**Other specially protected fauna** Fauna otherwise in need of special protection to ensure their conservation. Published as Specially Protected under the Wildlife Conservation Act 1950, in Schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice.

Appendix A1: Conservation Codes for Western Australian Flora and Fauna (Department of Parks and Wildlife, 2015) *continued*

Priority Species Codes	Description
P1	**Priority 1: Poorly-known species** 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
P2	**Priority 2: Poorly-known species** 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.
P3	**Priority 3: Poorly-known species** 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.
P4	**Priority 4: Rare, Near Threatened and other species in need of monitoring** (a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands. (b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable, but are not listed as Conservation Dependent. (c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.

Appendix A2: Definition of Threatened Flora Species (Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth))

Category Code	Category
Ex	**Extinct** Species which at a particular time if, at that time, there is no reasonable doubt that the last member of the species has died.
ExW	**Extinct in the Wild** Species which is known only to survive in cultivation, in captivity or as a naturalized population well outside its past range; or it has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
CE	**Critically Endangered** Species which at a particular time if, at that time, it is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
E	**Endangered** Species which is not critically endangered and it is facing a very high risk of extinction in the wild in the immediate or near future, as determined in accordance with the prescribed criteria.
V	**Vulnerable** Species which is not critically endangered or endangered and is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
CD	**Conservation Dependent** Species which at a particular time if, at that time: a) the species is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered; or b) the following subparagraphs are satisfied: (i) the species is a species of fish; (ii) the species is the focus of a plan of management that provides for management actions necessary to stop the decline of, and support the recovery of, the species so that its chances of long term survival in nature are maximized; (iii) the plan of management is in force under a law of the Commonwealth or of a State or Territory; (iv) cessation of the plan of management would adversely affect the conservation status of the species.

Appendix A3: Definitions and Criteria of Threatened Ecological Communities (Department of Environment and Conservation 2013)

Category Code	Category
PD	**Presumed Totally Destroyed** 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: (i) Records within the last 50 years have not been confirmed despite thorough searches or known likely habitats or; (ii) All occurrences recorded within the last 50 years have since been destroyed.
CE	**Critically Endangered** 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): 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 or iii): 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 very 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).
EN	**Endangered** 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): A) The 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): i) 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); ii) 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. B) Current distribution is limited, **and one or more** of the following apply (i, ii or iii): 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 short term future (within approximately 20 years); ii) there are few occurrences, each of which is small and/or isolated and all or most occurrences are very vulnerable to known threatening processes; iii) 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. 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).
VU	**Vulnerable** 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 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): A) The ecological community exists largely as modified occurrences that are likely to be capable of being substantially restored or rehabilitated. 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. 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.

Appendix A4: Definitions and Criteria for Priority Ecological Communities (Department of Environment and Conservation 2013)

Category Code	Category
P1	**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 ≤ 100ha). 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.
P2	**Poorly-known ecological communities:** Communities that are known from few occurrences with a restricted distribution (generally ≤10 occurrences or a total area of ≤200ha). At least some occurrences are not believed to be under immediate threat 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.
P3	**Poorly known ecological communities:** (i)Communities that are known from several to many occurrences, a significant number or area of which are not under threat of habitat destruction or degradation or: (ii) communities known from a few widespread occurrences, which are either large or with 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 may 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. 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.
P4	**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.** (iii) 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. (ii) 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. (iii) Ecological communities that have been removed from the list of threatened communities during the past five years.
P5	**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 B: Vegetation Condition Scale (Keighery 1994)

1='Pristine' Pristine or nearly so, no obvious signs of disturbance.

2=Excellent Vegetation structure intact, disturbance affecting individual species and weeds are non aggressive species. For example damage to trees caused by fire, the presence of non aggressive weeds and occasional vehicle tracks.

3=Very Good Vegetation structure altered, obvious signs of disturbance. For example disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback logging and grazing.

4=Good Vegetation structure significantly altered by very obvious signs of multiple disturbance. Retains basic vegetation structure or the ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds, partial clearing, dieback and grazing.

5=Degraded Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds, partial clearing, dieback and grazing.

6=Completely Degraded The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora composing weeds or crop species with isolated native trees or shrubs.

Appendix C: Vegetation Classification System

Form/Height	**Canopy Cover**				
	Dense 70-100%	Mid-Dense 30-70%	Sparse 10-30%	Very Sparse 2-10%	Scattered <2%
Trees>30m Trees 15-30m Trees 5-15m Trees <5m	Dense Tall Forest Dense Forest Dense Low Forest A Dense Low Forest B	Tall Forest Forest Low Forest A Low Forest B	Tall Woodland Woodland Low Woodland A Low Woodland B	Open Tall Woodland Open woodland Open Low Woodland A Open Low Woodland B	Scattered Tall Trees Scattered Trees Scattered Low Trees A Scattered Low Trees B
Mallee tree form Mallee shrub form	Dense Tree Mallee Dense Shrub Mallee	Tree Mallee Shrub Mallee	Open Tree Mallee Open Shrub Mallee	Very Open Tree Mallee Very Open Shrub Mallee	Scattered Tree Mallees Scattered Shrub Mallees
Shrubs >2m Shrubs 1-2m Shrubs <1m	Dense Thicket Dense Heath Dense Low Heath	Thicket Heath Low Heath	Scrub Low Scrub Dwarf Scrub	Open Scrub Open Low Scrub Open Dwarf Scrub	Scattered Tall Shrubs Scattered Shrubs Scattered Low Shrubs
Mat plants, Bunch Grass, Hummock Grass, Sedges, Herbs	Dense Mat Plants/ Grass/Hummock Grass/Sedges/Herbs	Mat Plants/Grass/ Hummock Grass/ Sedges/Herbs	Open Mat Plants/ Grass/Hummock Grass/Sedges/Herbs	Very Open Mat Plants/ Grass/Hummock Grass/ Sedges/Herbs	Scattered Mat Plants/ Grasses/Hummock Grasses/Sedges/Herbs

Modification of the vegetation classification system of Muir (1977)

Appendix D: Species of Conservation Significance recorded from NatureMap Species Report. (July 2016)

Species	Conservation Code
Beyeria similis	**P2**
Grevillea erectiloba	**P4**
Grevillea subterlineata	**P3**
Malleostemon sp. *Adelong* (G.J. Keighery 11825*)*	**P2**
Newcastelia insignis	**P2**
Philotheca coateana	**P3**
Thryptomene eremaea	**P2**

Appendix E: Species of Conservation Significance recorded from CALM and W A Herbarium searches commissioned by Paddington Gold P.L. (Dec.1998)

Species	Conservation Code
Beyeria similis	**P2**
Calytrix praecipua	**P3**
Eremophila mirabilis	**P2**
Eucalyptus jutsonii	**P4**
Grevillea erectiloba	**P4**
Grevillea subterlineata	**P3**
Gunniopsis propinqua	**P3**
Malleostemon sp. Adelong G.J. Keighery 11825)	**P2**
Micromyrtus serrulata	**P3**
Newcastelia insignis	**P2**
Philotheca coateana	**P3**
Philotheca desertii	**P3**
Ptilotus chortophytum	**P1**
Thryptomene eremaea	**P3**

Appendix F: Plant Species List by Vegetation Type (* Alien to Western Australia)

FAMILY	GENUS	SPECIES	SIMS	SAES	DRMS	SACS	REHAB
Amaranthaceae	*Ptilotus*	*aervoides*			X		
Amaranthaceae	*Ptilotus*	*exultatus*					X
Amaranthaceae	*Ptilotus*	*obovatus*	X	X	X	X	X
Amaranthaceae	*Ptilotus*	*schwarzii*	X		X		
Anacardiaceae	*Schinus*	*molle**					**1**
Apocynaceae	*Marsdenia*	*australis*	X	X	X		
Araliaceae	*Hydrocotyle*	*medicaginoides*			X		
Araliaceae	*Trachymene*	*ornata*	X			X	
Asteraceae	*Brachyscome*	*iberidifolia*			X	X	
Asteraceae	*Calotis*	*hispidula*					X
Asteraceae	*Chrysocephalum*	*puteale*	X	X			
Asteraceae	*Gilberta*	*tenuifolia*		X			
Asteraceae	*Lemooria*	*burkittii*			X		
Asteraceae	*Minuria*	*integerrima*			X		
Asteraceae	*Olearia*	*meulleri*	X				
Asteraceae	*Podolepis*	*gardneri*			X		
Asteraceae	*Podolepis*	*lessonii*	X				
Asteraceae	*Schoenia*	*ayersii*	X		X		
Asteraceae	*Sonchus*	*oleraceus**					X
Brassicaceae	*Carrichtera*	*annua**		X			X
Brassicaceae	*Menkea*	*australis*			X		
Brassicaceae	*Sisymbrium*	*orientale**					X
Brassicaceae	*Stenopetalum*	*filifoleum*	X		X		
Campanulaceae	*Isotoma*	*petraea*	X				
Campanulaceae	*Wahlenbergia*	*gracilenta*	X				

Appendix F: Plant Species List by Vegetation Type *continued*

FAMILY	GENUS	SPECIES	SIMS	SAES	DRMS	SACS	REHAB
Casuarinaceae	*Casuarina*	*pauper*	X				X
Chenopodiaceae	*Atriplex*	*bunburyana*					X
Chenopodiaceae	*Atriplex*	*codonocarpa*					X
Chenopodiaceae	*Enchylaena*	*tomentosa*	X	X			X
Chenopodiaceae	*Maireana*	*glomerifolia*		X			
Chenopodiaceae	*Maireana*	*planifolia*		X			
Chenopodiaceae	*Maireana*	*pyramidata*		X			X
Chenopodiaceae	*Maireana*	*sedifolia*		X			
Chenopodiaceae	*Maireana*	*tomentosa* subsp *tomentosa*					X
Chenopodiaceae	*Maireana*	*trichoptera*	X	X			X
Chenopodiaceae	*Maireana*	*triptera*					X
Chenopodiaceae	*Rhagodia*	*drummondii*	X				
Chenopodiaceae	*Salsola*	*australis*					X
Chenopodiaceae	*Sclerolaena*	*densiflora*		X			X
Chenopodiaceae	*Sclerolaena*	*diachantha*		X			
Chenopodiaceae	*Sclerolaena*	*eriacantha*	X				
Chenopodiaceae	*Zygophyllum*	*aurantiacum*					X
Crassulaceae	*Crassula*	*colorata*			X		
Cupressaceae	*Callitris*	*preissei*		X			
Euphorbiaceae	*Euphorbia*	*drummondii*			X		
Fabaceae	*Acacia*	*burkittii*					X
Fabaceae	*Acacia*	*caesaneura*	X	X	X	X	X
Fabaceae	*Acacia*	*craspedocarpa*		X			
Fabaceae	*Acacia*	*fuscaneura*					X
Fabaceae	*Acacia*	*hemiteles*		X			X

Appendix F: Plant Species List by Vegetation Type. c*ontinued*

FAMILY	GENUS	SPECIES	SIMS	SAES	DRMS	SACS	REHAB
Fabaceae	*Acacia*	*incurvaneura*	X	X	X		X
Fabaceae	*Acacia*	*jennerae*		X			X
Fabaceae	*Acacia*	*kempeana*	X	X			
Fabaceae	*Acacia*	*ligulata*	X		X		X
Fabaceae	*Acacia*	*murrayana*					X
Fabaceae	*Acacia*	*oswaldii*	X	X			
Fabaceae	*Acacia*	*quadrimarginea*	X		X		
Fabaceae	*Acacia*	*ramulosa* var *ramulosa*		X	X	X	X
Fabaceae	*Acacia*	*tetragonophylla*	X	X	X	X	X
Fabaceae	*Indigofera*	*georgei*			X		
Fabaceae	*Senna*	*artemisioides*					X
Fabaceae	*Senna*	*artemisioides* subsp *filifolia*	X	X			X
Fabaceae	*Senna*	*artemisioides* subsp X *coriacea*	X	X	X	X	X
Fabaceae	*Senna*	*artemisioides* subsp *helmsii*	X				
Geraniaceae	*Erodium*	*cygnorum*	X		X		X
Goodeniaceae	*Goodenia*	*havillandii*		X	X		X
Goodeniaceae	*Scaevola*	*spinescens*	X	X	X	X	X
Goodeniaceae	*Velleia*	*rosea*		X	X		
Haloragaceae	*Haloragis*	*trigonocarpa*		X	X		
Hemerocallidaceae	*Dianella*	*revoluta*		X			
Lamiaceae	*Prostanthera*	*althoferi*	X	X			
Lamiaceae	*Spartothamnella*	*teucriflora*	X	X	X		
Loranthaceae	*Amyema*	*fitzgeraldii*		X			
Malvaceae	*Abutilon*	*otocarpum*			X		

Appendix F: Plant Species List by Vegetation Type *continued* (* Alien to Western Australia)

FAMILY	GENUS	SPECIES	SIMS	SAES	DRMS	SACS	REHAB
Malvaceae	*Brachychiton*	*gregorii*		X			
Malvaceae	*Sida*	*calyxhymenia*	X	X	X	X	X
Malvaceae	*Sida*	sp. Excedentifolia (J.L.Egan)1925	X	X		X	X
Myrtaceae	*Eucalyptus*	*clellandii*					X
Myrtaceae	*Eucalyptus*	*leptopoda*				X	
Myrtaceae	*Eucalyptus*	*oleosa*		X			
Myrtaceae	*Micromyrtus*	*hymenonema*		X			
Plantaginaceae	*Plantago*	sp					X
Poaceae	*Amphipogon*	*caricinus*		X			
Poaceae	*Austrostipa*	*elegantissima*		X	X		
Poaceae	*Austrostipa*	*scabra*		X			
Poaceae	*Cenchrus*	*ciliaris**					**2**
Poaceae	*Eriachne*	*benthamii*			X		
Poaceae	*Eriachne*	*flaccida*		X			
Poaceae	*Erogrostis*	*falcata*		X			
Polygonaceae	*Rumex*	*hypogaeaus**			X		X
Polygonaceae	*Rumex*	*vesicarius**					X
Portulacaceae	*Calandrinia*	*polyandra*	X	X	X		
Portulacaceae	*Calandrinia*	*ptychosperma*			X		
Protaceae	*Grevillea*	*berryana*		X			
Protaceae	*Hakea*	*recurva* subsp *recurva*		X			
Pteridaceae	*Cheilanthes*	*lasiophylla*	X				
Pteridaceae	*Cheilanthes*	*sieberi*	X	X	X		
Rutaceae	*Philotheca*	*brucei*	X	X			

Appendix F: Plant Species List by Vegetation Type. (Continued)

FAMILY	GENUS	SPECIES	SIMS	SAES	DRMS	SACS	REHAB
Santalaceae	*Santalum*	*spicatum*	X	X	X		
Sapindaceae	*Dodonaea*	*lobulata*	X		X		X
Sapindaceae	*Dodonaea*	*rigida*	X	X		X	X
Scrophulariaceae	*Eremophila*	*clarkei*	X	X	X	X	X
Scrophulariaceae	*Eremophila*	*decipiens* subsp *decipiens*	X	X		X	
Scrophulariaceae	*Eremophila*	*eriocalyx*		X	X		
Scrophulariaceae	*Eremophila*	*forrestii*		X	X		
Scrophulariaceae	*Eremophila*	*latrobei* subsp *latrobei*	X				X
Scrophulariaceae	*Eremophila*	*longifolia*		X			X
Scrophulariaceae	*Eremophila*	*metallicorum*		X	X		
Scrophulariaceae	*Eremophila*	*oldfieldii*	X	X			X
Scrophulariaceae	*Eremophila*	*scoparia*		X	X		X
Solanaceae	*Nicotiana*	*occidentalis* subsp *obliqua*			X		
Solanaceae	*Solanum*	aff *centrale*		X			
Solanaceae	*Solanum*	*lasiophylla*	X	X			X
Violaceae	*Hybanthus*	*floribundus* subsp *curvifolius*			X		

1 Located in Auntie Nellie Pit (51J 315058 m E; 6716304 m S)
2 Located at edge of waste water sump (51J 315211 m E; 6716455 m S)

Appendix G: Fauna Observations by Vegetation Type

Common Name	**Scientific Name**	**Vegetation Type**	**Coordinates**
rabbit	*Oryctolagus cuniculus*	SAES	51J 315663 m E; 6717150 m S
Crested Bellbird	*Oreoica gutturalis*	SAES	51J 315663 m E; 6717150 m S
Wedgetail Eagle	*Aquila audax*	SAES	51J 316105 m E; 6718400 m S
Nest in Grevillea		SAES	51J 316105 m E; 6718400 m S
Cow dung		SAES	51J 316105 m E; 6718400 m S
Jackie Winter	*Microeca fascinans*	SAES	51J 316077 m E; 6718305 m S
Cow dung		SAES	51J 316922 m E; 6717326 m S
Red Kangaroo	*Macropus rufus*	SAES	
Welcome Swallows	*Hirundo neoxena*	SIMS-SAES INTERZONE	51J 316983 m E; 6716933 m S
Slenderbilled Thornbills	*Acanthiza iredalei*	SAES	51J 315663 m E; 6717150 m S
Rufous Whistler	*Pachycephala rufiventris*	SAES	
Grey Fantail	*Rhipidura fuliginosa*	SAES	
Common Bronzewing	*Phaps chalcoptera*	SIMS INFERRED/REHAB	
Crested Pigeon	*Ocyphaps lophotes*	SIMS INFERRED	
Peregrin Falcon	*Falco peregrinus*	SIMS INFERRED	
Rufous Songlark	*Cincloramphus mathewsi*	SIMS INFERRED	

Appendix G: Fauna Observations by Vegetation Type *(continued)*

Common Name	Scientific Name	Vegetation Type	Coordinates
Whitebrowed woodswallow	*Artamus superciliosus*	SAES	51J 315663 m E; 6717150 m S
Rabbit dung		REHAB	
Cattle prints		REHAB	
Fresh Roo dung		REHAB	
Spiney Cheeked Honeyeater	*Acanthagenys rufogularis*	REHAB	
Slenderbilled Thornbills	*Acanthiza iredalei*	REHAB	
Striated Pardalotes	*Pardalotus striatus*	REHAB	
Willy Wagtail	*Rhipidura leucophrys*	SIMS	
Whitebrowed Babbler	*Pomatostomus superciliosus*	SIMS	
Whitewinged Triller	*Lalage tricolor*	DRMS	
Emu tracks	*Dromaius novaehollandiae*	DRMS	
Cattle tracks and dung		DRMS	
Gilber'ts Whistler	*Pachycephala inornata*	SAES	51J 315663 m E; 6717150 m S
Southern Boobook	*Ninox novaeseelaniae*	SAES	51J 315663 m E; 6717150 m S
Black and White butterfly		SAES	51J 315800 m E; 6717633 m S
Camel tracks		SAES	51J 315896 m E; 6717609 m S
White fronted Honeyeater	*Phylidonyris albifrons*	SAES	51J 315896 m E; 6717609 m S

Appendix G: Fauna Observations by Vegetation Type *(continued)*

Common Name	**Scientific Name**	**Vegetation Type**	**Coordinates**
Raven	*Corvus coronoides*	SAES	51J 315663 m E; 6717150 m S
Mulga Dragon	*Caimanops amphiboluroides*	SACS	51J 313554 m E; 6717423 m S
Wolf Spider	Family: *Lycosidae*	SAES	51J 315663 m E; 6717150 m S