



Level 1
Flora and Vegetation Survey for the
Expansion of Mt Martin Mining Area,
Alacer Gold South Kalgoorlie
Operations
(M26/132)

Prepared for



Final
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1. INTRODUCTION.....	1
1.1 OBJECTIVES	1
1.2 GEOLOGY AND VEGETATION	2
1.3 CLIMATE.....	2
1.3.1 Temperature	2
1.3.2 Rainfall.....	3
2. ASSESSMENT METHODOLOGY	4
2.1 PRELIMINARY DESKTOP STUDY.....	4
2.1.1 Environment Protection and Biodiversity Conservation Act Protected Matters.....	4
2.1.2 Threatened Flora and Communities	4
2.1.3 Environmentally Sensitive Areas (ESAs) and Conservation Reserves	4
2.1.4 Vegetation Type, Extent and Status	5
2.1.5 Wetlands.....	5
2.1.6 Dieback.....	5
2.2 SITE INVESTIGATION.....	5
2.2.1 Licenses.....	5
2.3 PERSONNEL AND REPORTING	5
2.4 LIMITATIONS	5
3. RESULTS	6
3.1 PRELIMINARY DESKTOP ASSESSMENT.....	6
3.1.1 EPBC Act Protected Matters	6
3.1.2 Threatened Flora and Communities	6
3.1.3 Environmentally Sensitive Areas and Conservation Reserves.....	6
3.1.4 Vegetation Type, Extent and Status	6
3.1.5 Wetlands.....	7
3.1.6 Dieback.....	7
3.2 FIELD ASSESSMENT	8
3.2.1 Threatened Flora.....	8
3.2.2 Vegetation Type, Extent and Status	8
3.2.3 Weeds.....	18
3.2.4 Vegetation Condition	18
3.2.5 Assessment for the Clearing Principles	18
4. DISCUSSION.....	19
5. REFERENCES.....	20
APPENDIX 1 RELEVANT GOVERNMENT DATABASE SEARCH RESULTS.....	21
APPENDIX 2 THREATENED FLORA DATABASES SEARCH RESULTS	29
APPENDIX 3 VEGETATION CONDITION SCALE (KEIGHERY, 1994).....	32
APPENDIX 4 VEGETATION MAPPING.....	34
APPENDIX 5 SPECIES LIST	38

Figures

Figure 1: Regional map of survey location.....	1
Figure 2: Mean temperature ranges for Kalgoorlie-Boulder weather station	3
Figure 3: Monthly and mean rainfall for Kalgoorlie Boulder weather station 2011	3
Figure 4: Monthly and mean rainfall for Kalgoorlie Boulder weather station 2012	4
Figure 4: <i>Eucalyptus lesouefii</i> woodland within the survey area	9
Figure 5: <i>Eucalyptus salmonophloia</i> woodland within the survey area.....	10
Figure 6: Transitional <i>Eucalyptus</i> woodland within the survey area	11
Figure 7: <i>Eucalyptus griffithsii</i> woodland within the survey area	12
Figure 8: <i>Eucalyptus salmonophloia</i> and <i>E. lesouefii</i> woodland over <i>Tecticornia</i> within the survey area	13
Figure 9: <i>Eucalyptus ravida</i> woodland within the survey area.....	14
Figure 10: <i>Eucalyptus stricklandii</i> woodland over <i>Acacia kalgoorliensis</i> within the survey area	15
Figure 11: <i>Eucalyptus stricklandii</i> woodland on rocky hills within the survey area.....	16
Figure 12: <i>Eucalyptus oleosa</i> and <i>E. stricklandii</i> woodland over <i>Tecticornia</i> within the survey area.....	17

Tables

Table 1: List of potential survey limitations	6
Table 2: Summary of information regarding Pre-European and current vegetation extent of Vegetation Association 9 within the survey area.....	7
Table 3: Summary of information regarding Pre-European and current vegetation extent of Vegetation Association 468 within the survey area.....	7

1. INTRODUCTION

Alacer Gold Corporation (AQG) proposes to expand current mining operations at the Mt Martin project of its South Kalgoorlie Operations. This proposed area falls within pastoral title CG East 45, Mining tenement M26/132, Exploration Lease E26/139 and Prospecting Lease P26/3472. A land clearing permit will be submitted with the inclusion of this report.

The survey area is located approximately 33.1 km south east of Kalgoorlie in the Coolgardie Bioregion of Western Australia (Figure 1).

The total survey area received from AQG covers 423ha, north and east of the current pit and waste landform. This report will encompass results of the flora and vegetation survey for the expansion of the existing Mt Martin mining operations.

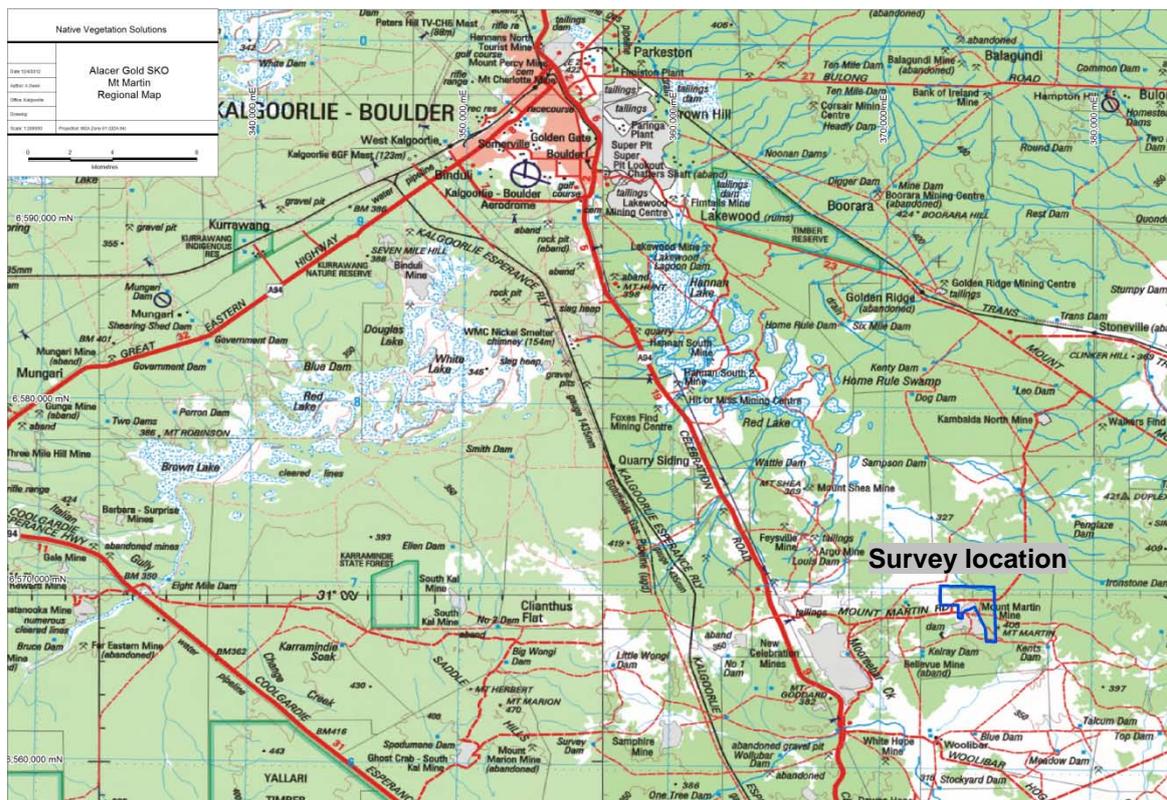


Figure 1: Regional map of survey location

AQG commissioned Native Vegetation Solutions (NVS) to complete a Level 1 Flora and Vegetation Survey of the Mt Martin area on the 9th of March 2012.

1.1 Objectives

EPA's *Position Statement No. 3* (EPA 2002) provides indicative levels of biological survey in relation to the scale and nature of the impact and the sensitivity of the receiving environment. The EPA uses the Interim Biogeographic Regionalisation of Australia (IBRA) as the largest unit for Environmental Impact Assessment decision making in relation to the conservation of biodiversity. Given the scale and nature of the proposed disturbance as well as the existing disturbance, and that the survey area is located within the Coolgardie IBRA region, a Level 1 flora and vegetation survey was required.

The objective of this report is to document the results of the flora and vegetation component of a Level 1 assessment conducted in accordance with the Environmental Protection Authority (EPA) "*Terrestrial Biological Surveys as an Element of Biodiversity Protection; Position*

Statement No 3' (EPA 2002) and *Guidance Statement No. 51 "Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia (EPA 2004)"*, for the purpose of mining.

A Level 1 study has two components:

1). Desktop study which includes a literature review and a search of the relevant databases;

and

2). Reconnaissance survey of the survey area to verify the desktop survey, to define vegetation units present in the area, search for species of conservation significance and to determine potential sensitivity to impact.

As part of the reporting for the Level 1 assessment, NVS has conducted a Flora and Vegetation Survey which includes broad-scale vegetation mapping and vegetation condition mapping of the survey area.

Therefore, the scope of work for the Flora and Vegetation Survey was to:

- conduct a desktop study that includes a literature review and search of the relevant databases;
- generally describe the vegetation associations in the survey area;
- prepare an inventory of species occurring in the survey area;
- identify any vegetation or flora of particular conservation significance; and
- provide recommendations, including the management of perceived impacts to flora and vegetation within the survey area.

1.2 Geology and Vegetation

The survey area lies in the Coolgardie (COO) bioregion within the Eastern Goldfields (COO3) subregion which totals over 5.1 million hectares (CALM, 2002). The COO3 subregion lies on the Yilgarn Craton's 'Eastern Goldfields Terrains'. The relief is subdued and comprises of gently undulating plains interrupted in the west with low hills and ridges of Archaean greenstones and in the east by a horst of Proterozoic basic granulite. The underlying geology is of gneisses and granites eroded into a flat plane covered with tertiary soils and with scattered exposures of bedrock. Calcareous earths are the dominant soil group and cover much of the plains and greenstone areas. A series of large playa lakes in the western half are the remnants of an ancient major drainage line. The vegetation is of Mallees, *Acacia* thickets and shrubheaths on sandplains. Diverse *Eucalyptus* woodlands occur around salt lakes, on ranges, and in valleys. Salt lakes support dwarf shrublands of samphire. Woodlands and *Dodonaea* shrubland occur on basic graninulites of the Fraser Range (CALM, 2002).

1.3 Climate

Typically the climate is characterised as being arid to semi-arid Mediterranean with mainly winter rainfall as well as summer thunderstorms. The area receives approximately 250-300mm of rainfall per year (Beard, 1990; CALM, 2001). The nearest official meteorological weather station with the most complete and up to date information is Kalgoorlie- Boulder Airport, which is located approximately 30 km north east of the survey area.

1.3.1 Temperature

Mean annual minimum temperature at Kalgoorlie is 11.7°C and mean annual maximum temperature is 25.2°C. The coldest temperatures occur in July (mean minimum temperature 5.0°C), the hottest is January (mean maximum temperature 33.7°C) and diurnal temperature variations are relatively consistent throughout the year (Figure 2).

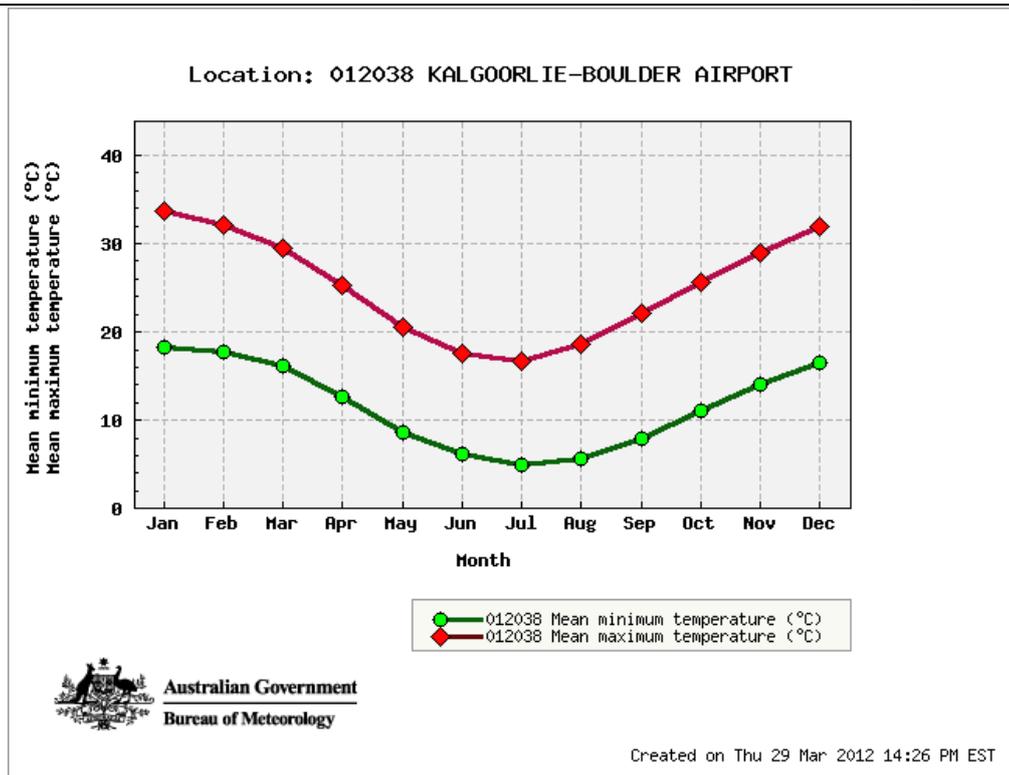


Figure 2: Mean temperature ranges for Kalgoorlie-Boulder weather station

1.3.2 Rainfall

The annual average rainfall at Kalgoorlie is 265.1mm over an average 68.4 rain days. Average rainfall varies across the months, with slightly larger rainfall events falling between January to March and May to July (Figure 3), and the least rainfall received in September. Rainfall for 2011 was above average for the months of January, February, July and October; and February and October received more than twice their mean monthly average.

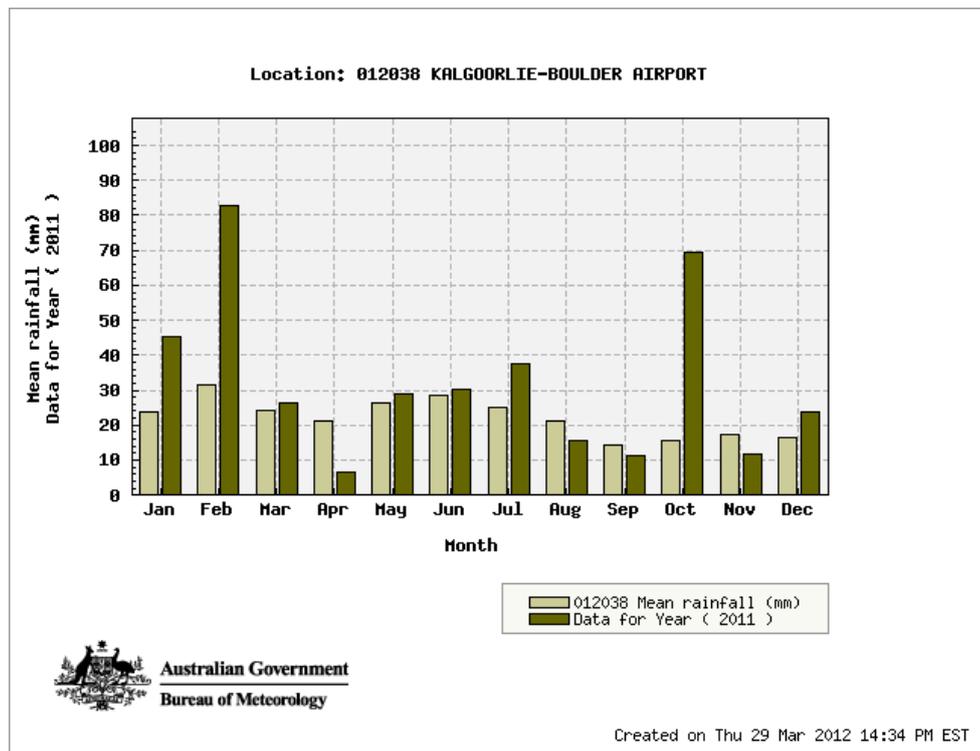


Figure 3: Monthly and mean rainfall for Kalgoorlie Boulder weather station 2011

Rainfall in 2012 was more than twice the average for March, while January and February recorded below average levels.

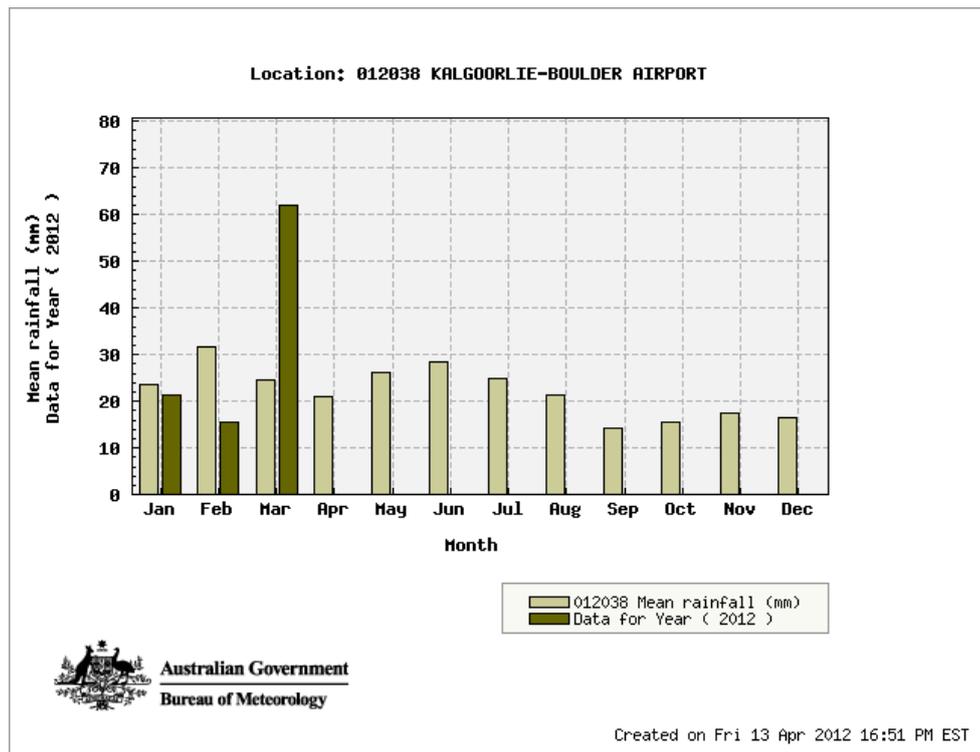


Figure 4: Monthly and mean rainfall for Kalgoorlie Boulder weather station 2012

2. ASSESSMENT METHODOLOGY

2.1 Preliminary Desktop Study

A preliminary assessment of the survey area and its potential constraints was undertaken by reviewing a number of government agency managed databases (see Appendix 1) and consulting where necessary. The following sections provide a summary of the methodology used for each potential environmental aspect associated with the project.

2.1.1 Environment Protection and Biodiversity Conservation Act Protected Matters

The *Environment Protection and Biodiversity Conservation (EPBC) Act 1999* Protected Matters Search tool was utilised to provide results for matters of National Environmental Significance within the survey area.

<http://www.environment.gov.au/arcgis-framework/apps/pmst/pmst-coordinate.jsf>

2.1.2 Threatened Flora and Communities

The Species and Communities Branch of the Department of Environment and Conservation (DEC) was contacted for a search of their databases containing known populations of threatened flora (Reference: 03-0412FL).

The presence of Threatened and Priority Ecological Communities (TECs & PECs) was determined by examining Geographic Information System (GIS) data supplied by the DEC upon request (Reference: 25-0412EC).

2.1.3 Environmentally Sensitive Areas (ESAs) and Conservation Reserves

DEC's Native Vegetation Map Viewer was used to determine the location of any ESAs (<http://www.dec.wa.gov.au/content/view/2920/1572/1/1/>).

The location of any Conservation Reserves was determined by examining GIS data available from the DEC website and consulting with the local DEC office where necessary.

2.1.4 Vegetation Type, Extent and Status

Vegetation extent and status data was sourced from the Department of Agriculture and Food (DAFWA) report "Land-Use and Vegetation in Western Australia- National Land and Water Resources Audit Report" and its associated GIS file. This data comprises Beard's Pre-European vegetation groups.

Note: This data was provided to Native Vegetation Solutions via a license agreement with the DAFWA.

2.1.5 Wetlands

The location of wetlands within the project area was determined by examining DAFWA's Wetland Base (<http://spatial.agric.wa.gov.au/wetlands/>).

2.1.6 Dieback

Dieback is only considered a potential issue for the project if both the mean annual rainfall of the area is >400mm, and if the project area resides below the 26th parallel.

2.2 Site Investigation

A site visit was carried out by Botanist Eren Reid and Consultant Ashley Owen from Native Vegetation Solutions on the 9/03/2012, to examine the flora and vegetation groups contained within the survey area. A total of 8 hours was spent on site traversing the survey area, by Kawasaki Mule and on foot.

The survey was conducted in accordance with relevant EPA's Statements and Guidelines (Section 1.1).

2.2.1 Licenses

Flora was collected for identification under the Scientific Collection License SL009444 held by Mr E. R. Reid with expiry 17/05/2012.

2.3 Personnel and Reporting

The following personnel were involved in the preparation of this report;

- Eren Reid *BSc (Biological Science)*, Principal Botanist, Native Vegetation Solutions, undertook the survey and review of the report; and
- Ashley Owen *DipSc*, Botanist/Consultant, undertook the survey, data collation and preparation of the report.

2.4 Limitations

Table 1 lists potential limitations that may have affected the survey. These are based on the listing given in the *Guidance Statement No. 51 Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia* (EPA, 2004). As shown, this survey was not limited by any factors listed below.

Table 1: List of potential survey limitations

Potential Limitations	Constraint (Y/N)	Comment
Competency and experience of the consultants undertaking the survey	N	Mr Eren Reid is an experienced botanist who has conducted many flora and vegetation surveys in the Goldfields, Pilbara and South-west regions of WA.
Proportion of flora identified during survey	N	As the survey was planned to target flora within a small survey area a complete census of the species present was attempted (Approx. 90%). Sufficient identifications were made to allow vegetation descriptions to be made.
Sources of information	N	DRF and Priority Flora GIS information was available from DEC.
Proportion of the task achieved	N	All tasks completed
Timing/Season	N	The targeted survey was conducted in Autumn 2012. Emergent annuals were present.
Disturbance in survey area	N	Disturbance was present in the form of grazing and historic exploration.
Intensity of survey effort	N	Transects were walked through the survey area with all parts visited
Resources	N	Adequate resources were available
Access problems	N	No problems with access
Availability of contextual information on the region	N	Information on the Coolgardie Bioregion is readily available.

3. RESULTS

3.1 Preliminary Desktop Assessment

3.1.1 EPBC Act Protected Matters

The EPBC Protected Matters search tool revealed that the survey area could possibly be suitable habitat for the weed species *Carrichtera annua* (Wards Weed). It stated that there are no TEC's within a km radius of the survey area.

The Native Vegetation Map Viewer search revealed that no ESA's or nature reserves occur within the survey area.

3.1.2 Threatened Flora and Communities

The DEC database searches revealed a potential for 2 Threatened and 28 Priority Flora species to occur within a 50km radius of the survey area (DEC, 2012). No known locations of these Flora occur within the survey area, while the closest location occurs approximately 18.04km north of the survey area.

Results of the threatened flora database search are included in Appendix 2.

The PEC/TEC search (DEC, 2012a) revealed that there are no TECs or PECs in the area.

3.1.3 Environmentally Sensitive Areas and Conservation Reserves

No ESA's are located within the survey area (DEC, 2012b).

3.1.4 Vegetation Type, Extent and Status

Information relating to known vegetation within the survey area has been summarised in Table 2 and 3 below. This information has been compiled through both desktop assessments and the site visit.

Table 2: Summary of information regarding Pre-European and current vegetation extent of Vegetation Association 9 within the survey area

Factor	Value				
Beard Vegetation Association*	9				
Vegetation Association Description*	Medium woodland; coral gum (<i>E. torquata</i>) & Goldfields blackbutt (<i>E. lesouefii</i>)				
Pre-European Extent (ha)	Scale				
	By Association (WA)	By Association (WA)	By IBRA Region (COO)	By IBRA Sub-region (COO3)	By Shire (City of Kalgoorlie-Boulder)
	244,735*	240,714**	240,647**	235,247**	38,743**
% Pre-European Extent Remaining*	100%	100%	100%	100%	100%
Surrounding Land Use	Mining, Exploration, Prospecting, Pastoral Lease				
Weed prevalence	Low				

* Source: Shepherd *et al.* (2002) Appendix 2

**Source: Shepherd *et al.* (2002) Associated GIS data

Table 3: Summary of information regarding Pre-European and current vegetation extent of Vegetation Association 468 within the survey area

Factor	Value				
Beard Vegetation Association*	468				
Vegetation Association Description*	Medium woodland; salmon gum & goldfields blackbutt				
Pre-European Extent (ha)	Scale				
	By Association (WA)	By Association (WA)	By IBRA Region (COO)	By IBRA Sub-region (COO3)	By Shire (City of Kalgoorlie-Boulder)
	476,113*	592,626**	583,952**	482,842**	303,823**
% Pre-European Extent Remaining*	100%	100%	100%	100%	100%
Surrounding Land Use	Mining, Exploration, Prospecting, Pastoral Lease				
Weed prevalence	Low				

* Source: Shepherd *et al.* (2002) Appendix 2

**Source: Shepherd *et al.* (2002) Associated GIS data

3.1.5 Wetlands

No wetlands which are recorded on the DAFWA WetlandBase occur within the survey area (DAFWA, 2011).

3.1.6 Dieback

The survey area lies south of the 26th parallel, however receives average annual rainfall of 265.1mm, below the 400mm threshold mark. There is no record of *Phytophthora cinnamomi* establishing in natural ecosystems in regions receiving <400mm rainfall per annum (CALM, 2003). Therefore Dieback is not considered an issue for this survey area, however all measures should be taken to prevent any possible soil contamination (seeds of non-native species *etc.*) which poses a risk in the survey area during seasonally favourable conditions.

3.2 Field Assessment

3.2.1 Threatened Flora

No plant taxa located in the survey area are gazetted as DRF pursuant to subsection 2 of Section 23F of the *Wildlife Conservation Act 1950*. No plant taxa listed as Threatened pursuant to Schedule 1 of the *Environment Protection and Biodiversity Conservation Act 1999* was located in the survey area.

There were no priority species recorded within the survey area.

3.2.2 Vegetation Type, Extent and Status

A total of 20 families, 36 genera and 74 species were recorded within the survey area. Nine major vegetation groups were recorded in the survey area, and are considered to be in Good or Degraded condition (using the scale of Keighery 1994, see Appendix 3). Maps of the survey area can be seen in Appendix 4 (Maps 2 and 3).

The vegetation groups are described in more detail below.

3.2.2.1 *Eucalyptus lesouefii* woodland

This vegetation group consisted of 19 Families, 29 Genera and 52 Species. The vegetation group was approximately 125.48 ha which makes up 29.68% of the survey area.

Dominant species were *Eucalyptus lesouefii*, *E. cylindriflora*, *Eremophila interstans* subsp. *virgata* and *Maireana sedifolia*.



Figure 5: *Eucalyptus lesouefii* woodland within the survey area

3.2.2.2 Salmon Gum (*Eucalyptus salmonophloia*) woodland

This vegetation group consisted of 13 Families, 18 Genera and 31 Species. The vegetation group was approximately 102.59 ha which makes up 24.27% of the survey area.

Dominant species were *Eucalyptus salmonophloia*, *E. lesouefii*, *Maireana sedifolia*, *Eremophila interstans* subsp. *virgata*, and *Sclerolaena diacantha*.



Figure 6: *Eucalyptus salmonophloia* woodland within the survey area

3.2.2.3 Transitional *Eucalyptus* woodland

This vegetation group consisted of 13 Families, 19 Genera and 35 Species. The vegetation group was approximately 61.11 ha which makes up 14.45% of the survey area.

Dominant species were *Eucalyptus transcontinentalis*, *E. lesouefii*, *E. salmonophloia*, *E. oleosa*, *Eremophila interstans* subsp. *virgata*, *E. oldfieldii* subsp. *angustifolia*, *Acacia erinacea*, and *Senna artemisioides* subsp. *filifolia*.



Figure 7: Transitional *Eucalyptus* woodland within the survey area

3.2.2.4 *Eucalyptus griffithsii* woodland

This vegetation group consisted of 9 Families, 12 Genera and 20 Species. The vegetation group was approximately 37.17 ha which makes up 8.78% of the survey area.

Dominant species were *Eucalyptus griffithsii*, *Acacia erinacea*, *Scaevola spinescens*, *Olearia muelleri*, *Senna artemisioides* subsp. *filifolia*, and *Dodonaea lobulata*.



Figure 8: *Eucalyptus griffithsii* woodland within the survey area

3.2.2.5 *Eucalyptus salmonophloia* and *E. lesouefii* woodland over *Tecticornia disarticulata*

This vegetation group consisted of 13 Families, 17 Genera and 28 Species. The vegetation group was approximately 24.94 ha which makes up 5.89% of the survey area.

Dominant species were *Eucalyptus salmonophloia*, *E. lesouefii*, *Tecticornia disarticulata*, and *Eremophila interstans* subsp. *virgata*.



Figure 9: *Eucalyptus salmonophloia* and *E. lesouefii* woodland over *Tecticornia* within the survey area

3.2.2.6 *Eucalyptus ravida* woodland

This vegetation group consisted of 9 Families, 12 Genera and 19 Species. The vegetation group was approximately 23.24 ha which makes up 5.49% of the survey area.

Dominant species were *Eucalyptus ravida*, *Eremophila interstans* subsp. *virgata*, *Maireana sedifolia*, *M. triptera*, and *Sclerolaena diacantha*.



Figure 10: *Eucalyptus ravida* woodland within the survey area

3.2.2.7 *Eucalyptus stricklandii* woodland over *Acacia kalgoorliensis*

This vegetation group consisted of 10 Families, 10 Genera and 16 Species. The vegetation group was approximately 3.91 ha which makes up 0.92% of the survey area.

Dominant species were *Eucalyptus stricklandii*, *Acacia kalgoorliensis*, *Eremophila oldfieldii angustifolia*, and *Eremophila decipiens* subsp. *decipiens*.



Figure 11: *Eucalyptus stricklandii* woodland over *Acacia kalgoorliensis* within the survey area

3.2.2.8 *Eucalyptus stricklandii* woodland on rocky hills

This vegetation group consisted of 11 Families, 13 Genera and 22 Species. The vegetation group was approximately 23.85 ha which makes up 5.63% of the survey area.

Dominant species were *Eucalyptus stricklandii*, *Leucopogon* sp. Clyde Hill, *Dodonaea lobulata*, *Acacia andrewsii*, *A. erinacea*, *Scaevola spinescens*, and *Olearia muelleri*.



Figure 12: *Eucalyptus stricklandii* woodland on rocky hills within the survey area

3.2.2.9 *Eucalyptus oleosa* and *E. stricklandii* woodland over *Tecticornia*

This vegetation group consisted of 12 Families, 16 Genera and 23 Species. The vegetation group was approximately 20.71 ha which makes up 4.89% of the survey area.

Dominant species were *Eucalyptus oleosa*, *E. stricklandii*, *Tecticornia disarticulata*, and *Eremophila interstans* subsp. *virgata*.



Figure 13: *Eucalyptus oleosa* and *E. stricklandii* woodland over *Tecticornia* within the survey area

3.2.3 Weeds

The EPBC search results revealed one weed species *Carrichtera annua* (Ward's Weed) was likely to occur within the survey area, however it was not recorded within the survey area.

Carrichtera annua was introduced into Australia from the eastern Mediterranean and first recorded in Port Pirie in South Australia in 1915. *C. annua* is now widespread throughout South Australia, the Interior, and Western Australia (Lamp & Collet, 1999).

This species is not listed as a declared plant by DAFWA (2012a).

3.2.4 Vegetation Condition

Evidence of grazing, as well as historic mining and exploration was observed during the field assessment.

Overall, the condition of the vegetation was determined to be "Good" with areas which were affected by grazing and historic exploration in either "Good" or "Degraded" condition.

3.2.5 Assessment for the Clearing Principles

The Department of Minerals and Petroleum (DMP) assesses clearing permits against ten principles relating to the effect of clearing. NVS submits the following comments regarding the Clearing principles specifically related to Native Vegetation;

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Vegetation communities are predominately eucalypt woodlands over chenopod shrublands on broad loamy plains and low rises. While 74 flora taxa representing 20 families were found during field survey, the vegetation is typical of the region and not considered to be unusually diverse.

(c) Native vegetation should not be cleared if it includes, or is necessary for, the continued existence of rare flora.

No DRF or Threatened Flora were located within the survey area. Additionally no Priority Flora were recorded in the survey area either.

(d) Native vegetation should not be cleared if it comprises the whole or part of, or is necessary for the maintenance of a threatened ecological community.

There are no known Threatened or Priority Ecological communities recorded in the survey area, and no vegetation groups recorded in the survey area are regarded as such.

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

As explained in section 3.1.4, both Beard vegetation associations which occur within the survey area are considered to have 100% of their spatial area remaining post European settlement, and are not adversely affected by extensive clearing such as farming.

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

The survey area contains no wetlands or watercourses.

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

No conservation areas are nearby.

4. DISCUSSION

The field assessment established that the condition of the vegetation in the proposed disturbance area is overall “Good”, with certain areas affected by grazing and exploration in “Degraded” condition. No areas of vegetation were assessed to be in “Pristine” condition.

No DRF, TECs or PECs were recorded in the survey area. No Priority Species were recorded within the survey area.

Any proposed disturbance/clearing of vegetation will result in a loss of species from the proposed expansion of the Mt Martin mining operations. However, given the size of the area and the extent of the Beard (1990) vegetation associations elsewhere, the impact on the vegetation and its component flora will not affect the conservation values of either, or create fragmentation or patches of remnant vegetation.

The following recommendations arise from the Level 1 flora survey:

- Where possible, avoid clearing areas unnecessarily; and
- Weed control measures should be implemented during and following earthworks.

5. REFERENCES

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Appendix 1

Relevant Government Database Search Results



EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information about the EPBC Act including significance guidelines, forms and application process details can be found at <http://www.environment.gov.au/epbc/assessmentsapprovals/index.html>

Report created: 29/03/12 15:41:07

[Summary](#)

[Details](#)

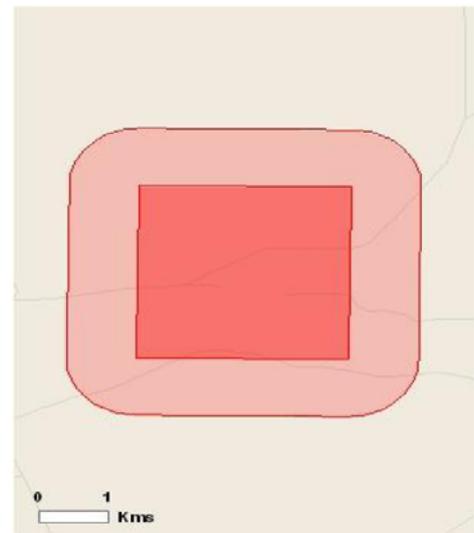
[Matters of NES](#)

[Other Matters Protected by the EPBC Act](#)

[Extra Information](#)

[Caveat](#)

[Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

[Coordinates](#)

Buffer: 1.0Km



Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see <http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html>

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Threatened Ecological Communities:	None
Threatened Species:	3
Migratory Species:	7

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage/index.html>

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at <http://www.environment.gov>.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	4
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

Place on the RNE:	None
State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	5
Nationally Important Wetlands:	None

Details

Matters of National Environmental Significance

Threatened Species		[Resource Information]
Name	Status	Type of Presence
BIRDS		
Acanthiza iredalei iredalei		
Slender-billed Thornbill (western) [25967]	Vulnerable	Species or species habitat likely to occur within area

Name	Status	Type of Presence
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
PLANTS		
Gastrolobium graniticum Granite Poison [14872]	Endangered	Species or species habitat likely to occur within area
Migratory Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat may occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Migratory Terrestrial Species		
Leipoa ocellata Malleefowl [934]	Vulnerable	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Migratory Wetlands Species		
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
Name	Threatened	Type of Presence
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat may occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area

Extra Information

Invasive Species

[[Resource Information](#)]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit,

Name	Status	Type of Presence
Mammals		
Capra hircus		
Goat [2]		Species or species habitat likely to occur within area
Felis catus		
Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Oryctolagus cuniculus		
Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Vulpes vulpes		
Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Carrichtera annua		
Ward's Weed [9511]		Species or species habitat likely to occur within area

Coordinates

-30.9931882 121.6669806,-30.99347263 121.6948252,-31.02109034 121.6944488,
-31.0208056 121.6665962,-30.9931882 121.6669806

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and

- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgements

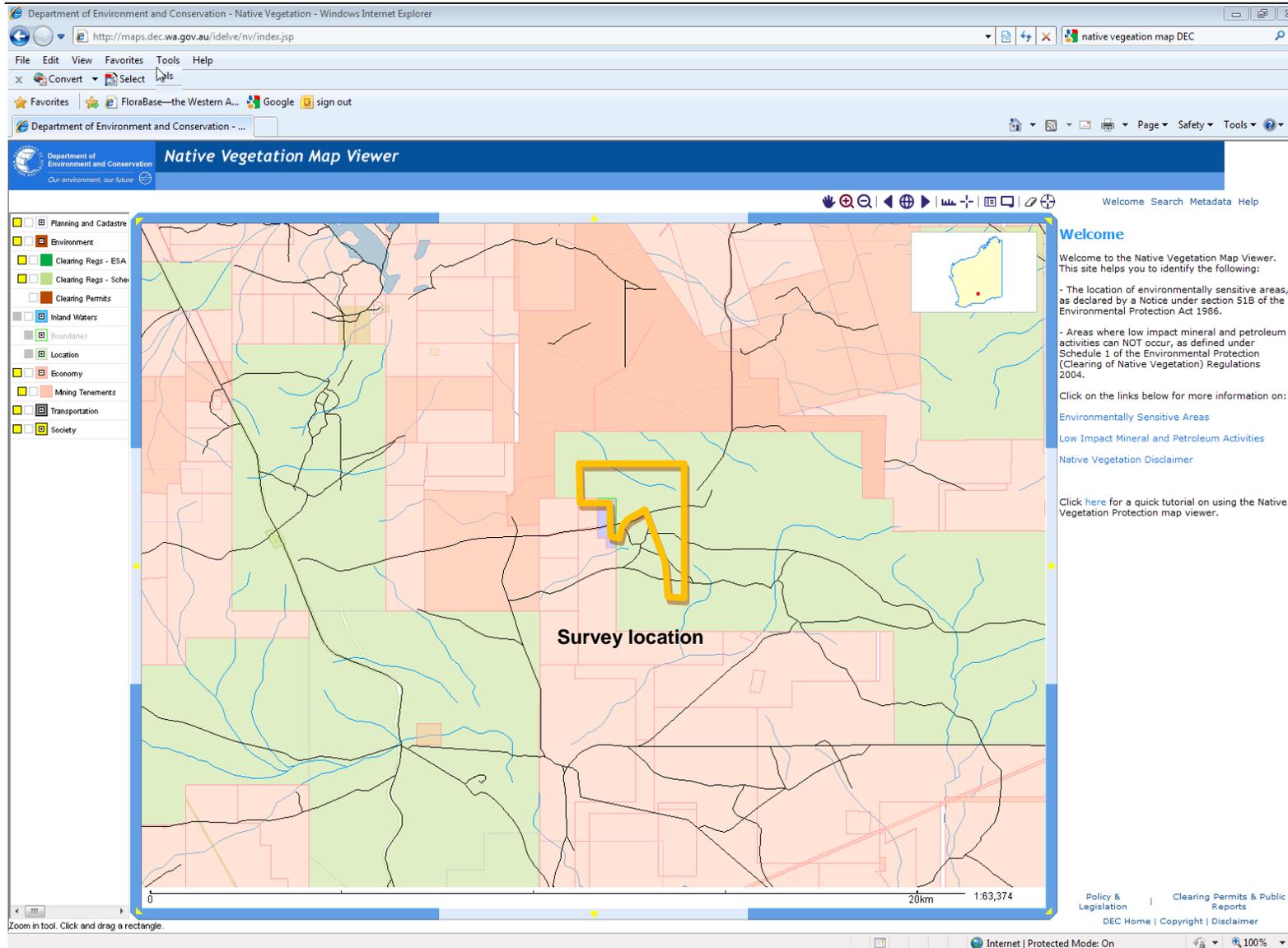
This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [Department of Environment, Climate Change and Water, New South Wales](#)
- [Department of Sustainability and Environment, Victoria](#)
- [Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [Department of Environment and Natural Resources, South Australia](#)
- [Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts](#)
- [Environmental and Resource Management, Queensland](#)
- [Department of Environment and Conservation, Western Australia](#)
- [Department of the Environment, Climate Change, Energy and Water](#)
- [Birds Australia](#)
- [Australian Bird and Bat Banding Scheme](#)
- [Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [Museum Victoria](#)
- [Australian Museum](#)
- [SA Museum](#)
- [Queensland Museum](#)
- [Online Zoological Collections of Australian Museums](#)
- [Queensland Herbarium](#)
- [National Herbarium of NSW](#)
- [Royal Botanic Gardens and National Herbarium of Victoria](#)
- [Tasmanian Herbarium](#)
- [State Herbarium of South Australia](#)
- [Northern Territory Herbarium](#)
- [Western Australian Herbarium](#)
- [Australian National Herbarium, Atherton and Canberra](#)
- [University of New England](#)
- [Ocean Biogeographic Information System](#)
- [Australian Government, Department of Defence](#)
- [State Forests of NSW](#)
- Other groups and individuals

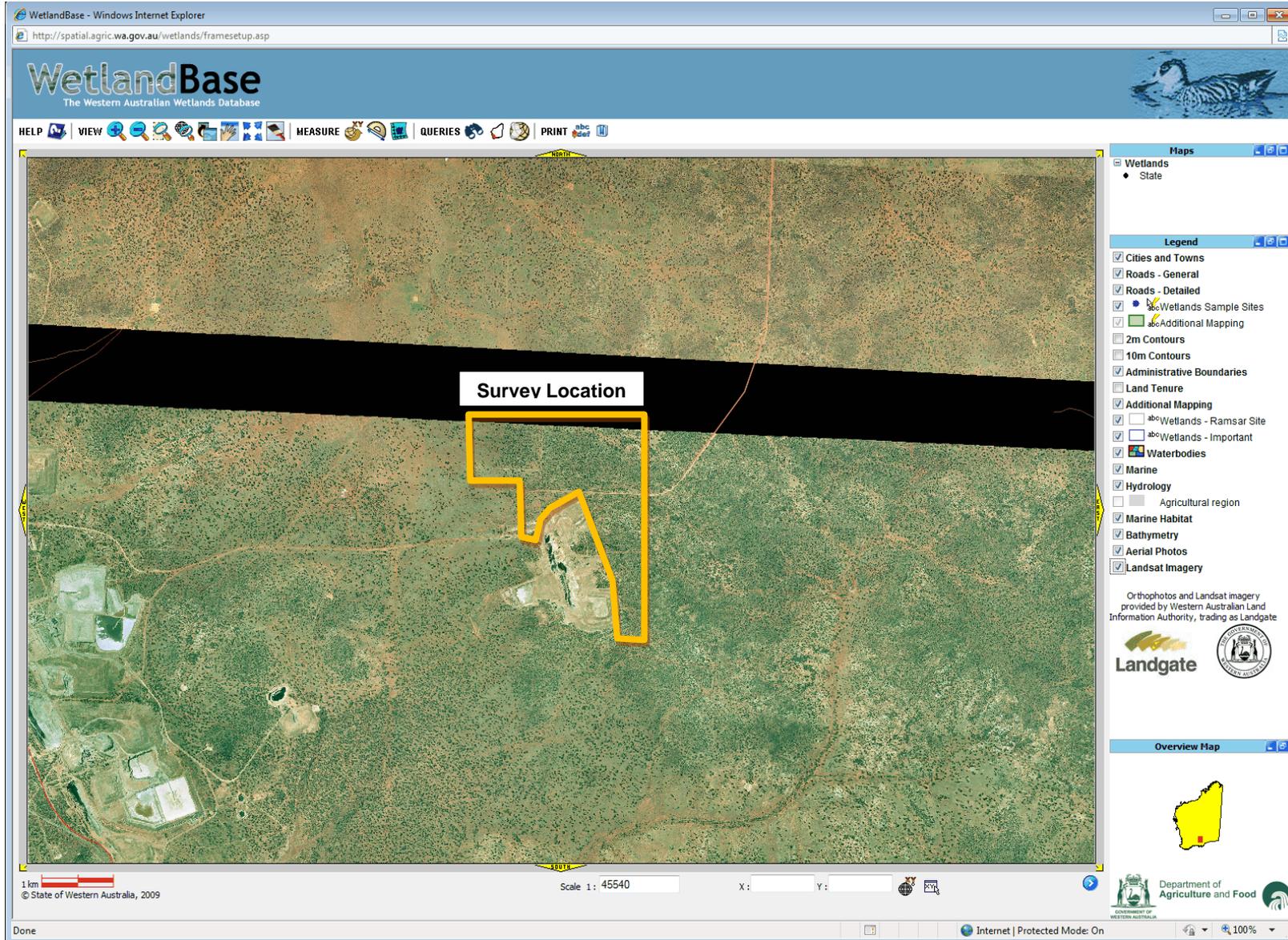
The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

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DEC's Native Vegetation Map Viewer showing no ESA's (dark green shaded areas) within the survey area (DEC, 2011b)



DAFWA Wetland Database showing no wetland areas within the survey area (DAFWA, 2012).

Appendix 2

Threatened Flora Databases Search Results

NameID	Taxon	Status	Rank	IUCN Criteria	EPBC	DEC Region	DEC District	Distribution	Flowering Period	Recovery Plan
3600	<i>Acacia websteri</i>	1				GOLD,WHTB	KALGOORLIE,CENTRAL WHEATBELT	Bencubbin, Coolgardie	-	
14636	<i>Alyxia tetanifolia</i>	3				GOLD,MWST	KALGOORLIE,GERALDTON	Kalgoorlie, Diemals, Goongarri, Boogardie, Mt Magnet	May	
7834	<i>Angianthus prostratus</i>	3				GOLD,WHTB	KALGOORLIE,CENTRAL WHEATBELT	Glenorn Stn, Baladjie Lake NR, Quairading, Lake Barlee, Bulga Downs Stn, Kalgoorlie	Jul-Sept	
17125	<i>Astartea</i> sp. Bungalbin Hill (K.R. Newbey 8989)	3				GOLD	KALGOORLIE	Bungalbin Hill, Helena & Aurora Ranges, Queen Victoria Rocks, Kalgoorlie, Boorabbin	Sep-Dec,Mar	
17038	<i>Astartea</i> sp. Red Hill (K.R. Newbey 8462)	1				GOLD	KALGOORLIE	Red Hill, Kambalda	Aug	
20684	<i>Baeckea</i> sp. Bulla Bulling (D.J.E. Whibley 4648)	1				GOLD	KALGOORLIE	Kalgoorlie, Bulla Bulling	Oct	
20749	<i>Baeckea</i> sp. Gnarlbine Rocks (G. Barrett GRH469)	1				GOLD	KALGOORLIE	Gnarlbine Rocks, Coolgardie	Oct	
1831	<i>Banksia lullfitzii</i>	3				GOLD,SCST, WHTB	ESPERANCE,KALGOORLIE, GREAT SOUTHERN, CENTRAL WHEATBELT	Southern Cross, Frank Hann N.P., Coolgardie, Mt Manning Range, Ravensthorpe	Mar-May	
3706	<i>Bossiaea concinna</i>	3				GOLD,SCST, WHTB	ALBANY,KALGOORLIE,CENTRAL WHEATBELT	Cunderdin, Woolgangie, Coolgardie, Lake Mason Stn, Jerramungup, Pithara	Sep,Oct	
7463	<i>Dampiera plumosa</i>	1				GOLD,MWST	KALGOORLIE,GERALDTON	Sandstone, Coolgardie, Lake Barlee	Oct	
3862	<i>Dillwynia acerosa</i>	3				GOLD,SCST, WHTB	ALBANY,ESPERANCE,KALGOORLIE,GREAT SOUTHERN	Coolgardie, Scaddan, Hyden, Condingup, Boxwood Hills, Ravensthorpe, Grass Patch	-	
14887	<i>Diocirea acutifolia</i>	3				GOLD	KALGOORLIE	Coolgardie, Kambala, Widgiemooltha	Nov-Dec	
7964	<i>Elachanthus pusillus</i>	2				GOLD,SCST	ESPERANCE,KALGOORLIE	Orchid Rock, Cocklebidy, Kalgoorlie, Jaurdi Stn	Oct	
11769	<i>Eremophila arachnoides</i> subsp. <i>tenera</i>	1				GOLD	KALGOORLIE	Kambalda, Laverton	Sep,Dec	
14516	<i>Eremophila praecox</i>	1				GOLD	KALGOORLIE	Five Mile Hill, (Kurrawang), Kalgoorlie, Kanowna Belle	Aug-Sep,Dec	
7278	<i>Eremophila veronica</i>	3				GOLD	KALGOORLIE	Queen Victoria Rock, Coolgardie	Oct-Nov	

NameID	Taxon	Status	Rank	IUCN Criteria	EPBC	DEC Region	DEC District	Distribution	Flowering Period	Recovery Plan
7280	<i>Eremophila virens</i>	T	EN	B1+2Ca	EN	GOLD,WHTB	KALGOORLIE,CENTRAL WHEATBELT	Mukinbudin, Westonia, Coolgardie	Aug-Oct	IRP
13053	<i>Eucalyptus websteriana</i> subsp. <i>norsemanica</i>	1				GOLD,SCST	ESPERANCE,KALGOORLIE	Norseman, Coolgardie	-	
11034	<i>Gastrolobium graniticum</i>	T	VU	D1	EN	GOLD,WHTB	KALGOORLIE,CENTRAL WHEATBELT	Coolgardie,Gnamma Hill,Naremben,Yellowdine, Bullabulling	Aug-Nov	
2064	<i>Grevillea phillipsiana</i>	1				GOLD,SCST	ESPERANCE,KALGOORLIE	Norseman, Yardina, Kambalda, Widgiemooltha	Aug-Sep	
3026	<i>Lepidium fasciculatum</i>	3				GOLD,MWST, SCST	ESPERANCE,KALGOORLIE, GERALDTON	Salmon Gums, Kalgoorlie, Esperance, Mingenew	Oct-Feb	
29493	<i>Leucopogon</i> sp. Kambalda (J. Williams s.n. PERTH 07305028)	1				GOLD	KALGOORLIE	Kambalda	Jan	
5891	<i>Melaleuca coccinea</i>	3				GOLD,SCST	ALBANY,ESPERANCE, KALGOORLIE	Karonie, Boulder, Widgiemooltha, Erayinia Hill, Norseman, Ravensthorpe	Oct-Nov	
27920	<i>Parmeliopsis macrospora</i>	3				GOLD,MWST, WHTB	KALGOORLIE,GERALDTON, CENTRAL WHEATBELT	Kalgoorlie, Ninghan Stn, Wanjarri NR,Mount Harry, Kathleen, Bullfinch, Kalbarri		
2266	<i>Persoonia leucopogon</i>	1				GOLD	KALGOORLIE	Between Coolgardie & Laverton, Comet Vale (Menzies)	-	
4498	<i>Phebalium clavatum</i>	2				GOLD	KALGOORLIE	Londonderry	Nov	
3059	<i>Phlegmatospermum ermaeum</i>	2				GOLD,SCST	ESPERANCE,KALGOORLIE	Coolgardie, Norseman, Cocklebiddy, Forrest	Aug-Oct	
2752	<i>Ptilotus procumbens</i>	1				GOLD	KALGOORLIE	Boulder	Nov	
7701	<i>Stylidium choreanthum</i>	3				GOLD,WHTB	KALGOORLIE,CENTRAL WHEATBELT	Helena & Aurora Range, Ghooli, Southern Cross, Kambalda, Koolyanobbing, Jaurdi Station, Ennuin Stn	Sep-Oct	
18001	<i>Xanthoparmelia dayiana</i>	3				GOLD,MWST	KALGOORLIE,GERALDTON	Kalgoorlie, Northern Territory, Karara		

Appendix 3

Vegetation Condition Scale (Keighery, 1994)

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.
For example, disturbance to vegetation structure caused by repeating fires, the presence of some more aggressive weeds, dieback, logging and grazing.

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

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

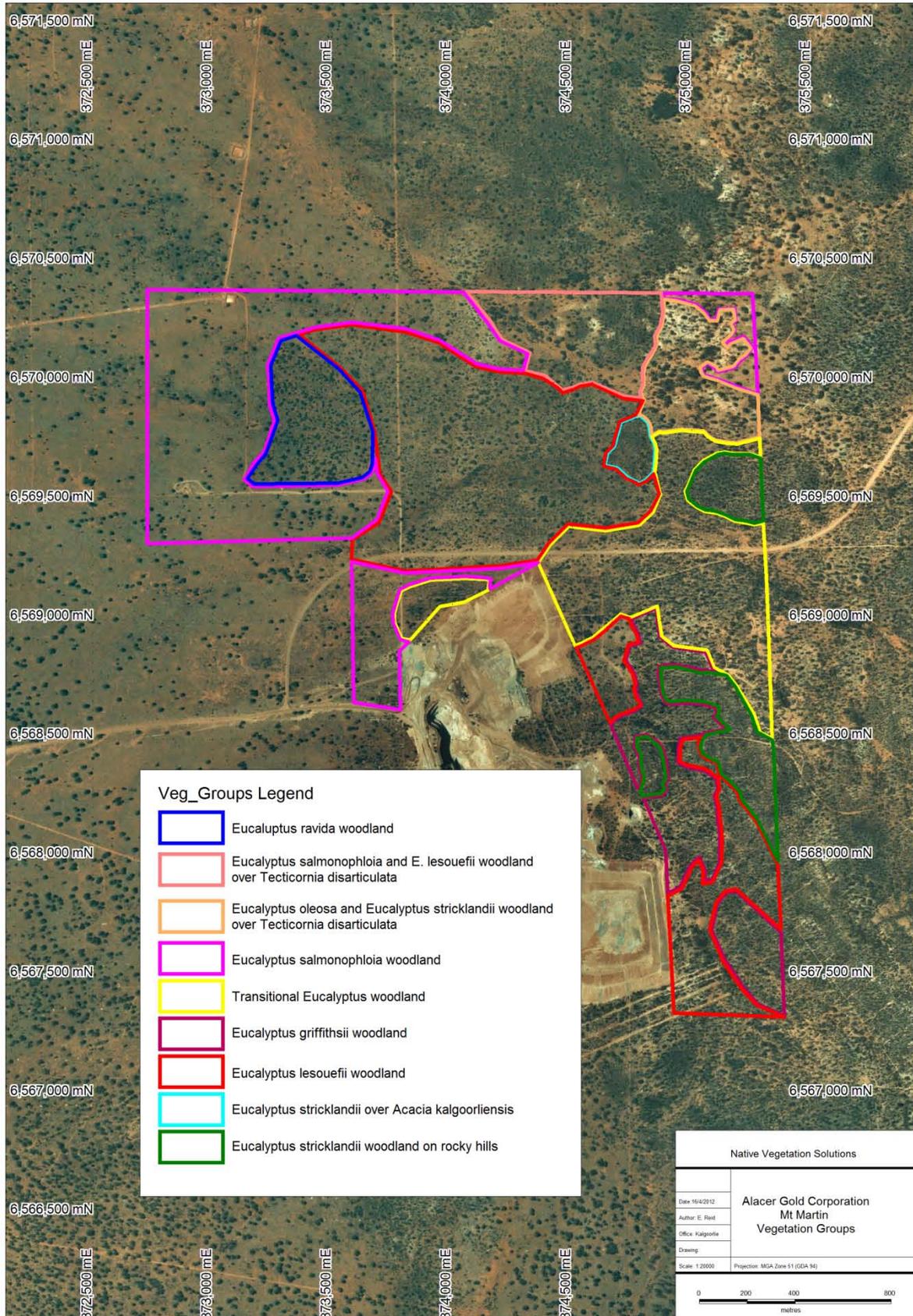
Completely Degraded (6). The structure of the vegetation is no longer intact and the area is completely or almost completely without native species.
These areas are often described as 'parkland cleared' with the flora compromising weed or crop species with isolated trees or shrubs.

Appendix 4

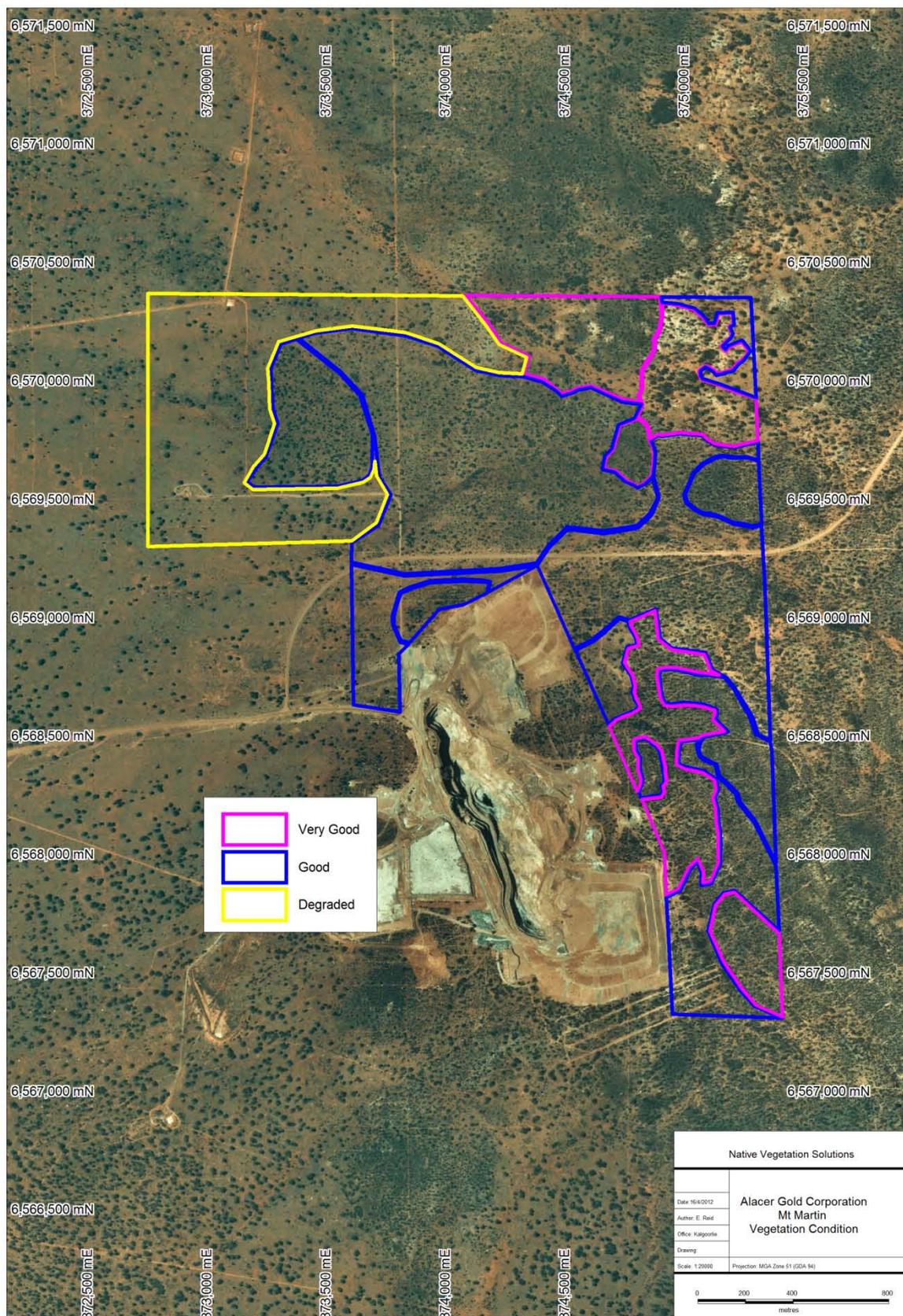
Vegetation Mapping



Mt Martin Survey Area



Mt Martin Vegetation Groups



Mt Martin Vegetation Condition

Appendix 5

Species List

Family	Genus	Species	P/A* NN**	Eucalyptus lesouefii woodland	Eucalyptus salmonophloia woodland	Transitional Woodland	Eucalyptus griffithsii woodland	Eucalyptus salmonophloia and E. lesouefii over Tecticornia	Eucalyptus ravida woodland	Eucalyptus stricklandii over Acacia kalgoorliensis	Eucalyptus stricklandii on rocky hill	Eucalyptus oleosa and E. stricklandii over Tecticornia
Amaranthaceae	<i>Ptilotus</i>	<i>exaltatus</i> var. <i>exaltatus</i>	A	*	*			*	*			*
Amaranthaceae	<i>Ptilotus</i>	<i>obovatus</i>	P	*	*	*						
Apocynaceae	<i>Alyxia</i>	<i>buxifolia</i>	P	*						*		
Apocynaceae	<i>Marsdenia</i>	<i>australis</i>	P			*						
Asteraceae	<i>Angianthus</i>	<i>tomentosus</i>	A	*	*				*			
Asteraceae	<i>Cratystylis</i>	<i>subspinescens</i>	P	*	*							
Asteraceae	<i>Olearia</i>	<i>muelleri</i>	P	*		*	*	*		*	*	*
Casuarinaceae	<i>Casuarina</i>	<i>pauper</i>	P	*		*			*	*	*	
Chenopodiaceae	<i>Atriplex</i>	<i>nummularia</i> subsp. <i>spathulata</i>	P	*		*	*	*				*
Chenopodiaceae	<i>Atriplex</i>	<i>stipitata</i>	P						*			
Chenopodiaceae	<i>Atriplex</i>	<i>vesicaria</i>	P					*				*
Chenopodiaceae	<i>Dissocarpus</i>	<i>paradoxus</i>	P	*	*							
Chenopodiaceae	<i>Dysphania</i>	<i>kalpari</i>	A			*						
Chenopodiaceae	<i>Enchylaena</i>	<i>tomentosa</i>	P			*						
Chenopodiaceae	<i>Maireana</i>	<i>brevifolia</i>	P	*		*						
Chenopodiaceae	<i>Maireana</i>	<i>georgei</i>	P	*	*	*		*				*
Chenopodiaceae	<i>Maireana</i>	<i>pentatropis</i>	P	*				*			*	
Chenopodiaceae	<i>Maireana</i>	<i>platycarpa</i>	P					*				
Chenopodiaceae	<i>Maireana</i>	<i>pyramidata</i>	P	*	*				*			
Chenopodiaceae	<i>Maireana</i>	<i>sedifolia</i>	P	*	*				*			*
Chenopodiaceae	<i>Maireana</i>	<i>tomentosa</i>	P			*						
Chenopodiaceae	<i>Maireana</i>	<i>triptera</i>	P	*	*	*		*	*			*
Chenopodiaceae	<i>Rhagodia</i>	<i>eremaea</i>	P			*	*					
Chenopodiaceae	<i>Sclerolaena</i>	<i>densiflora</i>	P	*	*	*			*			
Chenopodiaceae	<i>Sclerolaena</i>	<i>diacantha</i>	P	*	*	*		*	*			*
Chenopodiaceae	<i>Sclerolaena</i>	<i>eriacantha</i>	P	*	*				*			
Chenopodiaceae	<i>Sclerolaena</i>	<i>patenticuspis</i>	P	*	*			*				*
Chenopodiaceae	<i>Tecticornia</i>	<i>disarticulata</i>	P					*				*
Ericaceae	<i>Leucopogon</i>	sp. Clyde Hill	P								*	
Fabaceae	<i>Acacia</i>	<i>andrewsii</i>	P								*	
Fabaceae	<i>Acacia</i>	<i>collettioides</i>	P	*		*				*		
Fabaceae	<i>Acacia</i>	<i>erinacea</i>	P	*		*	*	*	*	*	*	*
Fabaceae	<i>Acacia</i>	<i>hemiteles</i>	P	*	*							
Fabaceae	<i>Acacia</i>	<i>kalgoorliensis</i>	P	*		*				*		
Fabaceae	<i>Acacia</i>	sp. narrow phyllode	P				*					
Fabaceae	<i>Acacia</i>	<i>tetragonaphylla</i>	P	*	*	*		*		*	*	
Fabaceae	<i>Senna</i>	<i>artemisioides</i> subsp. <i>filifolia</i>	P	*	*	*	*				*	
Fabaceae	<i>Senna</i>	<i>cardiosperma</i>	P	*	*							
Goodeniaceae	<i>Scaevola</i>	<i>spinescens</i>	P	*		*	*	*		*	*	*
Lamiaceae	<i>Salvia</i>	<i>verbenaca</i>	P	*	*							
Lamiaceae	<i>Westringia</i>	<i>rigida</i>	P							*	*	
Malvaceae	<i>Sida</i>	<i>intricata</i>	P	*	*							
Myrtaceae	<i>Eucalyptus</i>	<i>cylindriflora</i>	P	*								
Myrtaceae	<i>Eucalyptus</i>	<i>griffithsii</i>	P			*	*				*	
Myrtaceae	<i>Eucalyptus</i>	<i>lesouefii</i>	P	*		*		*				
Myrtaceae	<i>Eucalyptus</i>	<i>oleosa</i>	P			*					*	*
Myrtaceae	<i>Eucalyptus</i>	<i>ravida</i>	P				*					*
Myrtaceae	<i>Eucalyptus</i>	<i>salmonophloia</i>	P		*	*		*	*			

Family	Genus	Species	P/A* NN**	Eucalyptus lesouefii woodland	Eucalyptus salmonophloia woodland	Transitional Woodland	Eucalyptus griffithsii woodland	Eucalyptus salmonophloia and E. lesouefii over Tecticornia	Eucalyptus ravida woodland	Eucalyptus stricklandii over Acacia kalgoorliensis	Eucalyptus stricklandii on rocky hill	Eucalyptus oleosa and E. stricklandii over Tecticornia
Myrtaceae	<i>Eucalyptus</i>	<i>stricklandii</i>	P							*	*	*
Myrtaceae	<i>Eucalyptus</i>	<i>torquata</i>	P				*					
Myrtaceae	<i>Eucalyptus</i>	<i>transcontinentalis</i>	P			*					*	
Myrtaceae	<i>Melaleuca</i>	<i>sheathiana</i>	P	*			*	*			*	*
Pittosporaceae	<i>Pittosporum</i>	<i>angustifolium</i>	P	*	*		*	*				*
Poaceae	<i>Aristida</i>	<i>contorta</i>	A	*	*				*			
Poaceae	<i>Austrostipa</i>	<i>nitida</i>	P	*	*	*		*	*			*
Poaceae	<i>Eragrostis</i>	<i>eripoda</i>	P	*								
Proteaceae	<i>Grevillea</i>	<i>acuaria</i>	P	*			*					
Proteaceae	<i>Grevillea</i>	<i>stenobotrya</i>	P	*		*				*		
Santalaceae	<i>Exocarpos</i>	<i>aphyllus</i>	P	*		*		*	*			
Santalaceae	<i>Santalum</i>	<i>spicatum</i>	P	*	*						*	
Sapindaceae	<i>Dodonaea</i>	<i>lobulata</i>	P	*		*	*	*		*	*	*
Scrophulariaceae	<i>Eremophila</i>	<i>alternifolia</i>	P	*		*	*			*	*	
Scrophulariaceae	<i>Eremophila</i>	<i>decipiens subsp. decipiens</i>	P	*	*	*				*		
Scrophulariaceae	<i>Eremophila</i>	<i>glabra subsp. glabra</i>	P	*	*	*	*	*	*		*	
Scrophulariaceae	<i>Eremophila</i>	<i>granitica</i>	P	*			*				*	
Scrophulariaceae	<i>Eremophila</i>	<i>interstans subsp. virgata</i>	P	*	*	*	*	*	*	*		*
Scrophulariaceae	<i>Eremophila</i>	<i>oldfieldii subsp. angustifolia</i>	P	*	*	*	*	*	*	*	*	*
Scrophulariaceae	<i>Eremophila</i>	<i>oppositifolia subsp. angustifolia</i>	P	*		*				*		
Scrophulariaceae	<i>Eremophila</i>	<i>parvifolia subsp. auricampa</i>	P	*			*	*			*	
Scrophulariaceae	<i>Eremophila</i>	<i>scoparia</i>	P	*	*							
Solanaceae	<i>Solanum</i>	<i>nummularium</i>	P	*				*				*
Thymelaeaceae	<i>Pimelea</i>	<i>microcephala</i>	P	*	*							
Zygophyllaceae	<i>Zygophyllum</i>	<i>eremaum</i>	A	*	*			*				*

* Perennial/Annual

** Non-native