

# Minemakers Wonarah Phosphate Project

Desktop Flora and Fauna Assessment:

Proposed Borefield and Water Pipeline

Prepared for

Coffey Natural Systems

By

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## Summary

Minemakers Australia Pty Ltd (Minemakers) is currently in the development stage of their Wonarah Phosphate Project, located in the Barkly Tableland region of the Northern Territory (NT). Following on from flora, fauna and landscape surveys completed in June 2008 and March 2009, Low Ecological Services P/L (LES) was commissioned to undertake a desktop flora and fauna assessment of a proposed borefield and water supply pipeline, which will service the operations. The proposed borefield is located to the north of the Wonarah Phosphate Mineral Lease and consists of two existing production bores and three new production bores.

The borefield is located within the Mitchell Grass Downs Bioregion and the pipeline is located mainly within the Davenport and Murchison Ranges bioregion, it also occurs within part of the Wonarah Beds site of botanical significance.

Applicable NT (Parks and Wildlife Flora and Fauna Atlas) and Federal databases (Protected Matters Search from the Department of Environment Heritage and the Arts) were interrogated for presence of species listed under the TPWC Act or EPBC Act for conservation significance within a 50 km radius of the proposed borefield. Data collected by Low Ecological Services in 2008 and 2009 were also incorporated into the search.

The review of environmental factors identified the following key issues within the search area that may require management during the construction and operation of the borefield and pipeline.

- The proposed pipeline is located within the Wonarah Beds site of botanical significance where White *et al.* (2000) identify a number of rare (but not formally listed) flora species;
- Nine flora species were listed as data deficient under the TPWC Act;
- Five flora species were listed as near threatened under the TPWC Act;
- Eleven introduced (and possibly more) flora species could occur;
- Two fauna species were listed as vulnerable under the EPBC and/or TPWC
- Five fauna species were listed as near threatened and two as data deficient under the TPWC Act;
- Eight migratory bird species listed under the EPBC Act; and,
- Five (and possibly more) introduced fauna species could occur.

Whilst the review of environmental factors did not identify any species or habitats of high ecological or conservation significance within the area surrounding the proposed borefield and pipeline, the following should be taken into consideration:

- There were very few flora or fauna records within the Black Soil Plains habitat around the borefield and this habitat type. LES did not survey this habitat type in detail in SEL26452.

Where possible the pipeline Right of Way should divert around the following areas:

- Wetland and swamps;
- Grey clays and black soils plains (due to cracking clay construction stability issues); and,

- Any low lying areas subject to frequent inundation with water.

During the construction and operational phase of the project, the following should be considered when developing the construction and environmental management plan:

- The borefield and pipeline should be built so that there is no free standing water, regardless of whether or not it is fenced off;
- The amount of trench open at any one time should be minimised;
- Lateral ramps should be installed in the trench to allow for fauna to escape;
- Trenches must be examined daily to remove any fauna trapped in the trenches;
- If any animal is caught in the trench it should be removed asap and a system of photographing and recording should be developed (note that the 1983 NT Gas Pipeline project provided some of the best fossorial fauna data in the NT);
- When closing the trench no soil mounds or trenches should be left to minimise impact on surface water flow;
- Erosion control features should be installed as necessary along with flat bottom (not V) offlet drains or diversion bunds at intervals relative to the slope;
- No winrows should be left along the pipeline or adjacent service track;
- An audit should be conducted by an experienced consultant at the start, middle and end of the project;
- A flora, fauna and landscape management induction should be given to all contractors.

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## 1. Introduction

Minemakers Australia Pty Ltd (Minemakers) is currently in the development stage of their Wonarah Phosphate Project, located in the Barkly Tableland region of the Northern Territory (NT). Following on from flora, fauna and landscape surveys completed in June 2008 and March 2009, Low Ecological Services P/L (LES) was commissioned to undertake a desktop flora and fauna assessment of a proposed borefield and water supply pipeline which will service the operations.

The proposed borefield is located to the north of the Wonarah Phosphate Mineral Lease and consists of two existing production bores and three new production bores (Figure 1). The estimated area of disturbance around each bore site is 30 m x 30 m and each bore will be fenced. The final route or Right of Way (ROW) for the water supply pipeline will run in the most direct line from the borefield to the Mineral Lease (ML). The ROW construction area for the pipeline will be 25 m wide with an operational area of 4.5 m (or the width of a light vehicle track) which will provide access to service the pipeline after construction.

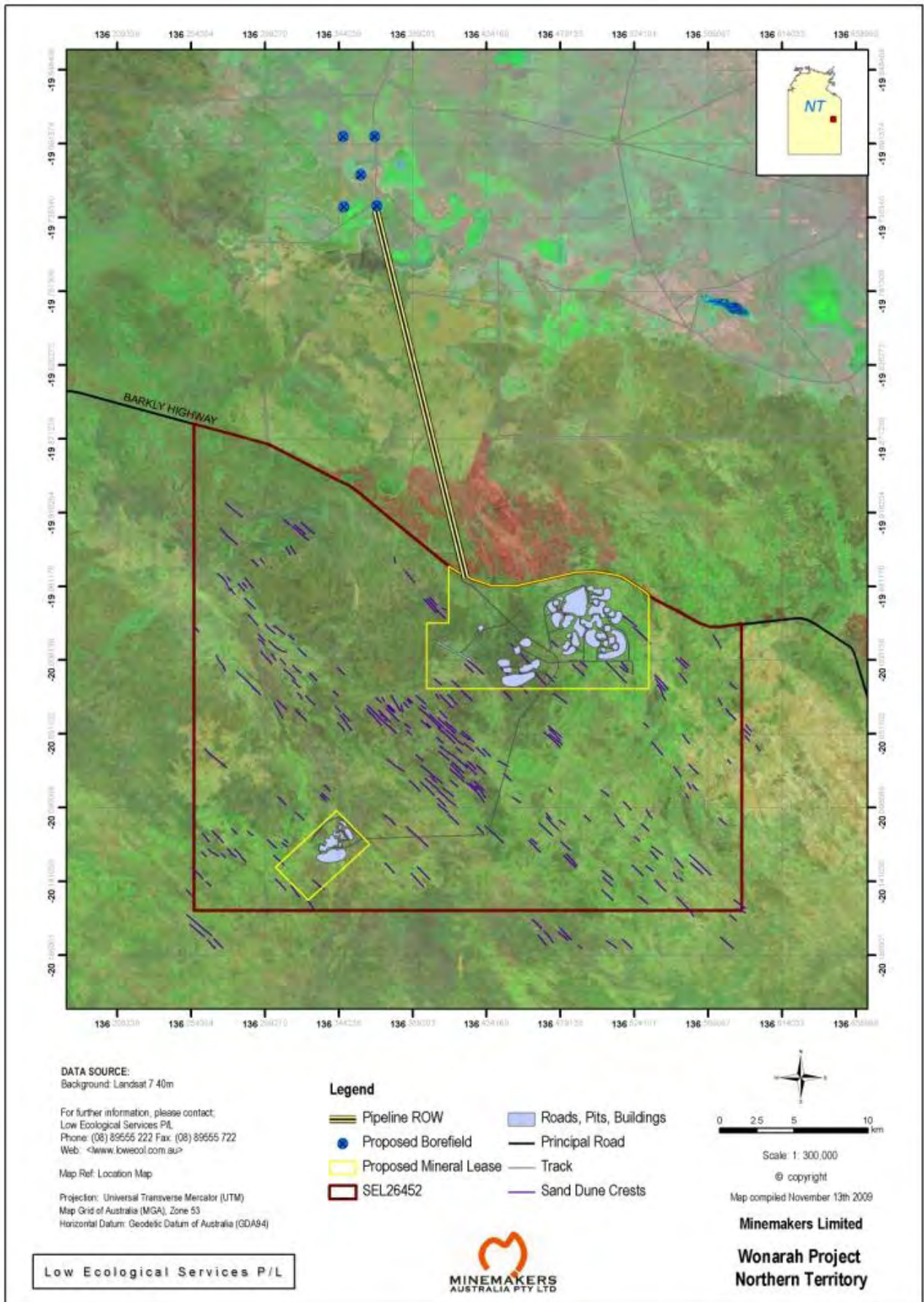
The purpose of this desktop assessment is to review existing data to determine flora and fauna that are likely to be disturbed by the construction and operation of the borefield and associated water supply infrastructure and to identify areas to avoid.

## 2. Bioregional Context

The proposed borefield lies in the Mitchell Grass Downs Bioregion which is described by Baker *et al.* (2005) as “Georgina and Dunmurras Basins containing sedimentary rocks of Cretaceous, Tertiary and Cambrian ages and soils are predominantly cracking clays. The vegetation is predominantly *Eucalyptus microtheca* low open-woodland with bluebush (*Chenopodium auricomum*) sparse shrubland understorey, and mitchell grass (*Astrebla*) grassland on the Barkly Tableland. The southern section contains gidgee (*Acacia georginae*) low open woodland with *Astrebla* open grassland understorey. Drainage in the tableland is complex, with a number of short creeks and rivers flowing toward several large seasonal lakes, while the Rankin and Georgina Rivers flow southeast of the bioregion”.

The proposed pipeline lies within the Davenport and Murchison Ranges bioregion, which Purdie *et al.* (2008) describes as being “dominated by rugged rocky hills of folded volcanics, sandstone, siltstone and conglomerates. Soils are generally shallow lithosols, however deep fine-grained alluvial soils occur in the valleys and surrounding plains. Vegetation communities are dominated by spinifex (*Triodia* sp.), hummock grassland and low eucalypt and acacia open woodland”.

The water supply pipeline overlies the Wonarah beds site, which is classified as significant on a bioregional scale by the NRETAS Parks and Conservation Masterplan (Figure 2). White *et al.* (2000) describe the Wonarah beds as low rises of chert chalcedony, tertiary travertine, silicified coquinite and limestone, and outcrops of Cambrian dolomite framed in a sandplain. The beds occur over a very large area and values of this site may not be unique and extend over a much larger region. The distinctive undulating feature is unique to the Wakaya desert to the west of the area and contains the only known collection site of *Sporobolus latzii* and is a type location for *Acacia drepanocarpa subsp. latifolia*. No ecosystems in the greater bioregion have been formally listed as threatened.



**Figure 1:** Proposed borefield and water pipeline in relation to the Wonarah Mineral Lease

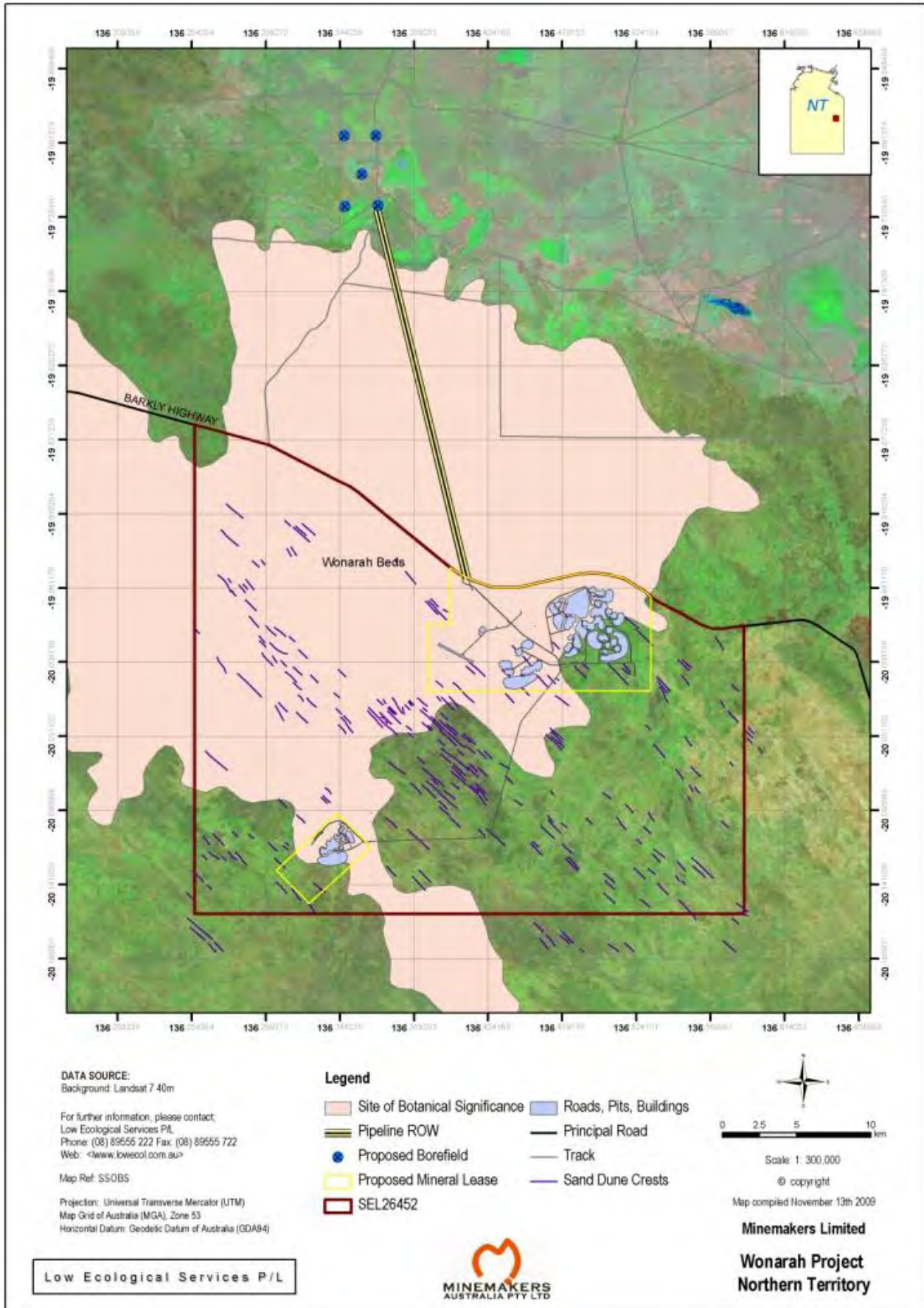


Figure 2: Wonarah Beds Site of Botanical Significance in relation to the proposed borefield and water pipeline



## 2.1. Landforms Physiography and Geology

The physiography of the project area has been described by Noakes and Traves (1954). The area is noted for general low relief of the landscape although small bevelled chert/silcrete rocky outcrops are locally common. Surface flow in the area is relatively disorganised, with no significant water courses present. More detailed geological information is available as a result of the considerable mineral exploration work in the region by Minemakers and its predecessors over the last 45 years.

## 2.2. Landsystems

Stewart *et al.* (1954) (Barkly Region) and Perry *et al.* (1962) (Southern NT) broadly mapped the Landsystems (LS) of the region (Figure 3). Low Ecological Services (see Moon *et al.* 2009) provided detailed LS mapping (based on regolith units) south of the proposed borefield and pipeline in SEL26452 (see Figures herein for location of SEL26452) and extension of this mapping to the north is possible. However, in this report (due to time restraints) we only provide reference to the broader land units.

The borefield is located within the Barkly LS and Wonarah/Barkly LS and the proposed pipeline traverses the Wonarah/Barkly LS and Yelvertoft LS (Figure 3).

Stewart *et al.* (1954) describe the Barkly LS as gently undulating to nearly flat with *Astrelba pectinata* (mitchell grass) plains covering much of the area and the Yelvertoft LS as undulating, with mostly skeletal soils and truncated gravelley lateritic red earths; *Eucalyptus brevifolia* or *E. dichromophloia* woodlands.

Stewart *et al.* (1954) describe the Wonarah LS as gently undulating with lateritic red earths and *Eucalyptus brevifolia* woodland or *Eucalyptus*. spp (low mallees) – *Acacia* spp. shrubland. Perry *et al.* (1962) describe the Wonarah LS as gently undulating plains with stonier higher parts and broad lowlands, relief mainly up to 30 ft; red clayey sands and red earths, partly lateritic; soft spinifex with sparse shrubs and low trees.

## 2.3. Soils

The Bureau of Rural Sciences (1991) broadly mapped the soils in the region (Figure 4). Low Ecological Services (see Moon *et al.* 2009) provided more detailed soil mapping (following Isbell 1996) south of the proposed borefield and pipeline in SEL26452 and extension of this mapping to the north is possible. However, in this report (due to time restraints) we only provide reference to the to the broader soil mapping.

Soils in the proposed pipeline and borefield area fall within soil classes CC61, By4 and My80 (Figure 4). CC61 is described as flat to gently undulating plains of grey clays interspersed with low undulating rises of red earths. Using the Australian Soil Classification (Isbell 1996) the units are likely to be made of Epicalcareous Endohypersodic grey Sodosols, Vertosols (grey clays) and red Dermosols (red earths).

By4 is described as undulating ridge and slope terrain on lateritic sediments; some rock outcrops: chief soils are shallow sands usually containing large amounts (>60%) of mixed and variable gravels or ironstone gravels and also uniform coarse sands with some gravels on ridges and upper slopes generally. Associated are shallow to deep varieties of loose red siliceous sands and the previous incorporating large

amounts (> 60%) of mixed and variable gravels, neutral red earths and gravelly red neutral massive earths on mid and lower slopes. Small areas of other soils are likely. By4 occurs across much of the SEL26452 where Moon et al. (2009) divided the soils into Kandosols, Vertosols, Calcarosols and Rudosols.

My80 contains gently undulating plains slightly elevated above the adjoining cracking clay plains; some narrow ridges and hills with rock outcrop and some shallow depressions. The dominant soils on the long gentle slopes and low rises are neutral red earths with a variable content and surface scatter of ironstone gravels. Associated are sands with coherent red and yellow earthy subsoils (on slopes and in depressions; loamy massive earths incorporating neutral red earths and acid yellow earths marginal to the cracking clay plains; and some shallow gravelly and stony coarse sands on ridges and hills. My80 occurs only in the north-western edge of SEL26452 where the unit was divided into Kandosols, Vertosols and Rudosols by Moon *et al.* (2009)

#### 2.4. Flora

ARC/INFO coverage for the 1:1,000,000 NT vegetation map based on Wilson *et al.* (1990) indicates that the vegetation in the borefield and pipeline area falls within Class 42 L1H3, Class 107 Z2G3 and Class 96 G3 (Figure 5).

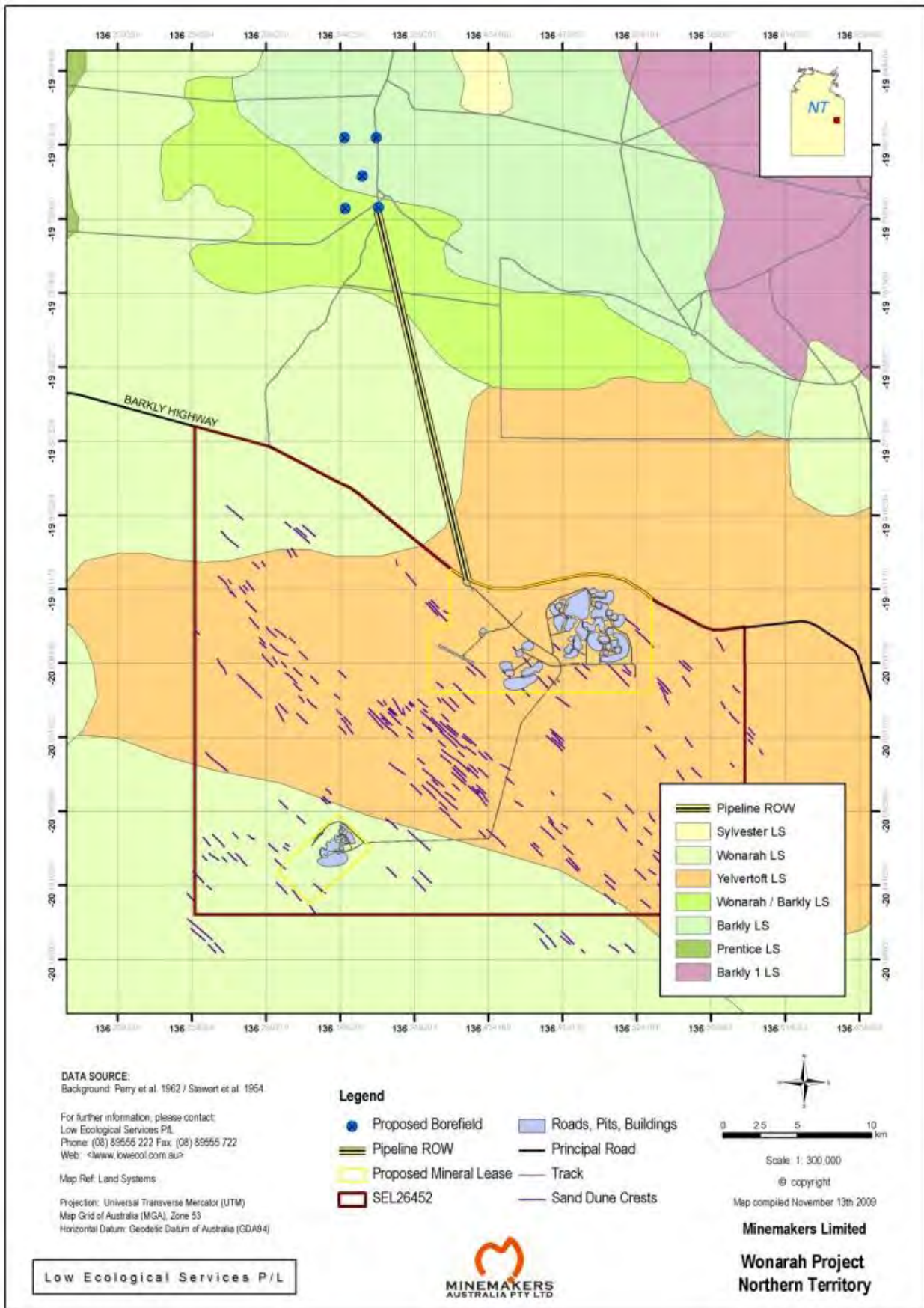
Class 42 L1H3 is described as encompassing *Corymbia opaca*, (bloodwood), low open-woodland with *Triodia pungens* (soft spinifex) hummock grassland understorey. L1 is a structural formula referring to lifeform and height of trees <10m tall with a density (projective foliage coverage) of 1-9%. H3 is a structural formula referring to lifeform and height of hummock grassland with a density (projective foliage coverage) of 30-69%.

Class 107 Z2G3 is described as chenopod low sparse shrub/forbes land with *Chenopodium auricomum* (bluebush) low open-shrubland with ephemeral grassland understorey. Z2 is a structural formula referring to lifeform and height of shrubs < 2m tall with a density (projective foliage coverage) of 10-29 %. H3 is a structural formula referring to lifeform and height of hummock grassland with a density (projective foliage coverage) of 30-69%.

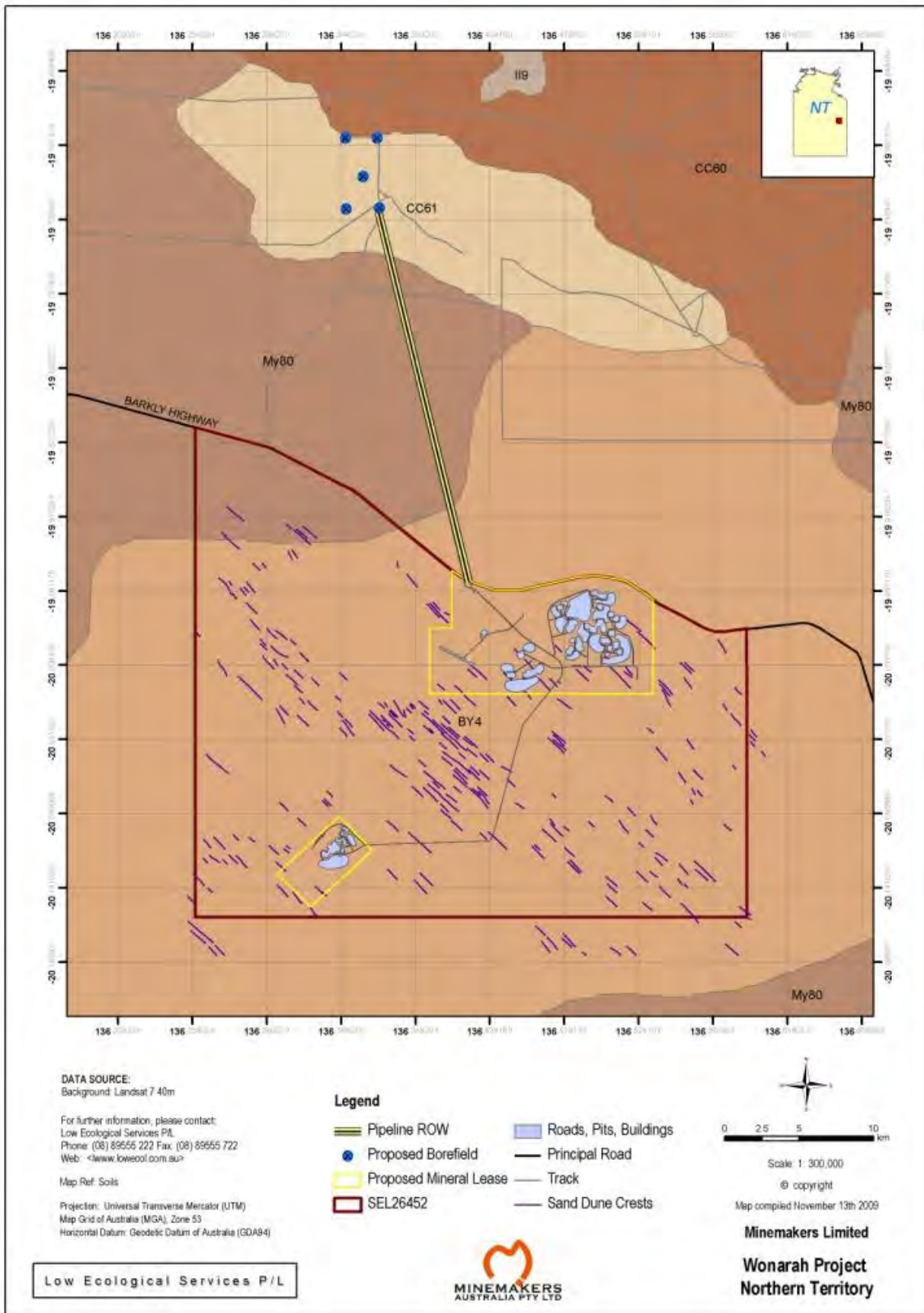
Class 96 G3 is described as *Astrebla pectinata* (mitchell grass) grassland. G3 is a structural formula referring to lifeform and height of tussock grass with a density (projective foliage coverage) of 10-29 %.

Within the Wonarah beds site, White *et al.* (2000) identify three taxa of Australian significance (*Bonamia alatisemina*, *Rothia indica subsp australis* and *Sporobolus latzii*) six taxa of NT significance (*Distichostemon barklyanus*, *Heliotropium ballii*, *Heliotropium pulvinum*, *Najas marina*, *Triumfetta centralis*, *Triumfetta deserticola*), one taxa of southern NT significance (*Grevillea dryandri subsp. dryandri*) and four taxa of bioregional significance (*Eragrostis olida*, *Exocarpos sparteus*, *Isoetes muelleri*, and *Tephrosia stuartii*).

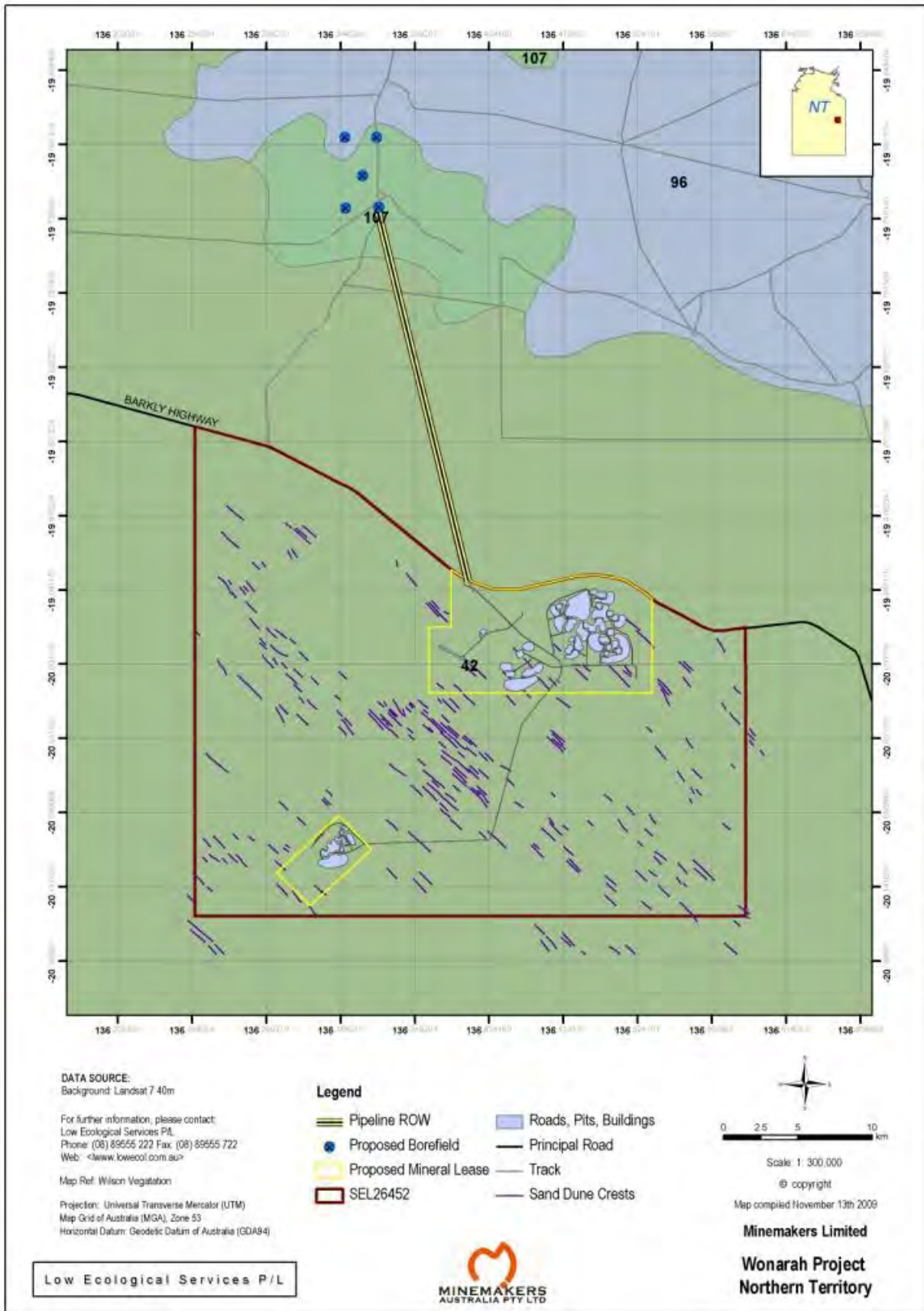
A biological survey of the Wakaya Desert was undertaken by the Department of Natural Resources Environment Arts and Sports (NRETAS) in the early 1990's. Important species data from this survey have been entered in the NT Flora and Fauna Atlas (2008) which have been included in this report below.



**Figure 3:** Land systems (LS) of the area surrounding the proposed borefield and water pipeline. Modified after Stewart *et al.* (1954) and Perry *et al.* (1962)



**Figure 4:** Soils of the area surrounding the proposed borefield and water pipeline. Modified after Bureau of Rural Sciences (1991)



**Figure 5:** Arc/Info coverage for vegetation classes of the area surrounding the proposed borefield and water pipeline. Modified after Conservation Commission of the NT (1991). See text for descriptions coded by numbers 42, 96 and 107.

### 3. Database Searches and Survey Data

#### 3.1. Flora

##### 3.1.1 Protected Matters Search

A protected matters report generated from the Department of the Environment Water Heritage and the Arts (DEWHA) web site (21<sup>st</sup> October 2009) within a 50 km radius of the proposed borefield was undertaken (Appendix 1). The borefield was chosen as the centre for this search to take in the black soil plain country, which was not represented well in the areas to the south where LES completed detailed flora surveys.

*No flora species listed under the Environment Protection and Biodiversity Act 1999 (EPBC Act) or Territory Parks and Wildlife Conservation Act 2000 (TPWC Act) were identified within the search area.*

##### 3.1.2 NT Atlas

A search of the NT Parks and Wildlife Flora Atlas (2008) for the same area as the protected matters report identified 611 records of 296 species (Appendix 2 and Figure 6). Note that there are very few flora records near the proposed borefield and northern end of the pipeline (Figure 6).

*No flora species listed under the EPBC Act or TPWC Act were identified at or above Vulnerable Status although nine species were listed under the TPWC Act as data deficient and/or by Baker et al. (2005) as significant at a NT or National level. A further three species were listed as near threatened under the TPWC Act and by Baker et al. (2005) as significant at National level (Table 1).*

**Table 1:** Flora identified by the NT Parks and Wildlife Flora database within a 50 km radius of the proposed borefield (see Appendix 2 for key to conservation codes)

Full Name	Common Name	TPWC	EPBC	SSOBS level	SSOBS code
<i>Bonamia alatisemina</i>		dd		National	3K
<i>Distichostemon barklyanus</i>		dd		Northern Territory	3k
<i>Heliotropium ballii</i>		dd		Northern Territory	3k
<i>Heliotropium pulvinum</i>		dd		Northern Territory	3K
<i>Pennisetum basedowii</i>	Asbestos Grass	dd		Northern Territory	3k
<i>Senecio depressicola</i>		dd		Northern Territory	3k
<i>Sesbania simpliciuscula</i>		dd		Northern Territory	3k
<i>Sporobolus latzii</i>		dd		National	1K
<i>Triumfetta deserticola</i>		dd		Northern Territory	3k
<i>Dentella minutissima</i>		nt		Northern Territory	3rC-
<i>Najas marina</i>	Prickly Waternymph, Prickly Naiad	nt		Northern Territory	3rC-
<i>Potamogeton pectinatus</i>	Fennel Pondweed, Sago Pondweed	nt		Northern Territory	3r



### 3.1.3 Low Ecological Services – Flora Surveys

Low Ecological Services completed two flora surveys (in the Dry Season 2008 and Wet season 2009) within SEL26452 (see Moon *et al.* 2009 for methods). This data is useful to indicate the likely occurrence of flora species within the southern end of the pipeline where similar habitat occurs (see Figures 3, 4 and 5 for boundaries of soils, LS and vegetation classes). The borefield and northern end of the pipeline is located in black soil plain country which was not surveyed or represented well within SEL26452.

A total of 162 flora species were recorded during the two surveys (Appendix 3). In general the area was dominated by sand plains with *Acacia*, *Grevillea*, and *Hakea spp.* over *Aristida* and *Triodia*; open woodlands with *Acacia*, *Eucalyptus (and Corymbia)*, *Hakea and Melaleuca spp.* over *Acacia* shrubs and *Triodia spp.*; and rocky rises with sparse *Acacia*, *Eucalyptus*, and *Triodia spp.*

*No flora species identified during these investigations were listed under the EPBC Act or TPWC Act at or above Vulnerable level; however, two species were listed as Near Threatened (Bergia barklyana and Hibiscus brachychlaenus) and one as Data Deficient (Heliotropium pulvinum) under the TPWC Act (Table 2).*

**Table 2:** Flora species of conservation significance identified by Low Ecological Services within SEL26452 (see Moon *et al.* 2009 for details)

Full Name	TPWC	EPBC	SSOBS level	SSOBS code
<i>Bergia barklyana</i>	nt		National	3R
<i>Hibiscus brachychlaenus</i>	nt		Northern Territory	3r
<i>Heliotropium pulvinum</i>	DD		Northern Territory	3K

The SSOBS conservation code, as defined by White *et al.* (2000) for each of these species are:

*Bergia barklyana* (3R) – a rare species of national significance with a geographic range exceeding 100 km but not currently considered to be threatened.

*Hibiscus brachychlaenus* (3r) – a rare species of significance in the NT with a geographic range exceeding 100 km but not currently considered to be threatened.

*Heliotropium pulvinum* (3k) as taxa with a geographic ranges exceeding 100 km with the potential to belong to a conservation category.

### 3.1.4 Introduced Species

Two introduced flora species (*Aerva javanica*, kapok bush and *Cenchrus ciliaris*, buffel grass) were identified by the NT Parks and Wildlife Flora Atlas (2008) within the 50 km of the borefield (and also by LES in 2009).

*Neither of these species are listed under the NT Weeds Management Act (2001) but both have the potential to occur in the borefield and/or pipeline area.*

Baker *et al.* (2005) identify 11 introduced species that are of concern in the Davenport and Murchinson and/or Mitchell Grass Downs bioregion (Table 3). Many other introduced flora species could potentially



occur, particularly as the project area is in close proximity to a major highway where vehicles are a vector for weeds.

**Table 3:** Weed species that could occur within the Borefield and Pipeline project area.

Name	Class	WONS	Habitat	Source
Bellyache bush ( <i>Jatropha gossypifolia</i> )	B			2
Buffel Grass ( <i>Cenchrus ciliaris</i> )	not classed		Disturbed areas, Towns, Roads, swamp margins	1
Carribbean Stylo ( <i>Stylosanthes hamata</i> )	not classed			2
Coffee Bush ( <i>Leucaena leucocephala</i> )	not classed		Disturbed areas, Towns	1
Kapok Bush ( <i>Aerua javanica</i> )	not classed		Disturbed areas, Roads	2
Marvel Grass ( <i>Dichanthium annulatum</i> )	not classed			1
Mesquite ( <i>Prosopis limensis</i> )	B	WONS	Pastoral, Water ways and floodplains	1
Neem ( <i>Azadirachta indica</i> )	not classed		Towns, Riparian,	1
Noogoora Burr ( <i>Xanthium strumarium</i> )	B		Pastoral, Roads and tracks	1
Olive hymenachne ( <i>Hymenachne amplexicaulis</i> )	not classed	WONS	Water ways and floodplains	1
Para Grass ( <i>Urochloa mutica</i> )	not classes		Floodplains, drainage lines	1
Paddy's Lucerne ( <i>Sida rhombifolia</i> )	B		Blocks & gardens, Pastoral, Roads and Tracks	1
Parkinsonia ( <i>Parkinsonia aculeata</i> )	B	WONS	Pastoral, Water ways and floodplains, Blocks & gardens	1
Ruby Dock ( <i>Acetosa vesicaria</i> )	not classed		Waterways and floodplains	1
Setaria verticillate	not classed			2
Spiked Malvastrum ( <i>Malvastrum americanum</i> )	not classed		Water ways, Pastoral and Roads.	2

Data source: 1) Northern Territory Bioregions – assessment of key biodiversity values and threats (Baker *et al.* 2005; p66-67, p108), and 2) NT Parks and Wildlife Flora Atlas (2008) (<50 km radius). Note: NT Weed classes A (to be eradicated), B (growth and spread to be controlled), Weeds of National Significance (WONS), and exotic plants of conservation importance.

## 3.2. Fauna

### 3.2.1 Protected Matters Search

A protected matters report generated from the DEWHA web site (21<sup>st</sup> October 2009) within a 50 km radius of the proposed borefield was undertaken (Appendix 1). Again, the borefield was chosen as the centre for this search to take in more of the black soil plain country, which was not represented well in the areas to the south where LES completed detailed fauna surveys.

*No endangered or critically endangered species were listed, although one threatened (Vulnerable - EPBC Act) species (Australian painted snipe, *Rostratula australi*) and eight migratory bird species were listed (Appendix 1). Australian painted snipe could occur in well vegetated ephemeral areas, all migratory species are not known to occur but could in appropriate seasons. Note that Mulgara (*Dasycercus cristicauda*/D. *Blythi*) was not included in this protected matters report, although it was included when the centre of the search was 25 km to the south-east.*

### 3.2.2 NT Atlas

A search of the NT Parks and Wildlife Fauna Atlas (2008) for the same area as the Protected Matters Search identified 896 records of 187 species (Appendix 4 and Figure 7). Note that there were no fauna records near the proposed borefield and northern end of the pipeline (Figure 7).

*One fauna species was listed under the TPWC Act at Vulnerable Status along with four species at near threatened and two species data deficient level. One species was listed under the EPBC Act although the listing refers to the northern sub species of yellow chat (Epthianura crocea) (Table 4)*

**Table 4:** Fauna recorded under the NT Parks and Wildlife Fauna database within a 50 km radius of the proposed borefield (see Appendix 4 for key to conservation codes)

Group	Species Name	TPWC	EPBC
Reptile	<i>Aspidites ramsayi</i>	NT	
Bird	<i>Lophoictinia isura</i>	NT	
Bird	<i>Phaps histrionica</i>	NT	
Mammal	<i>Rattus villosissimus</i>	NT	
Bird	<i>Ardeotis australis</i>	VU	
Frog	<i>Cyclorana australis</i>	DD	
Reptile	<i>Varanus spenceri</i>	DD	
Bird	<i>Epthianura crocea</i>	EN\LC	VU\NL

### 3.3. Low Ecological Services – Fauna Surveys

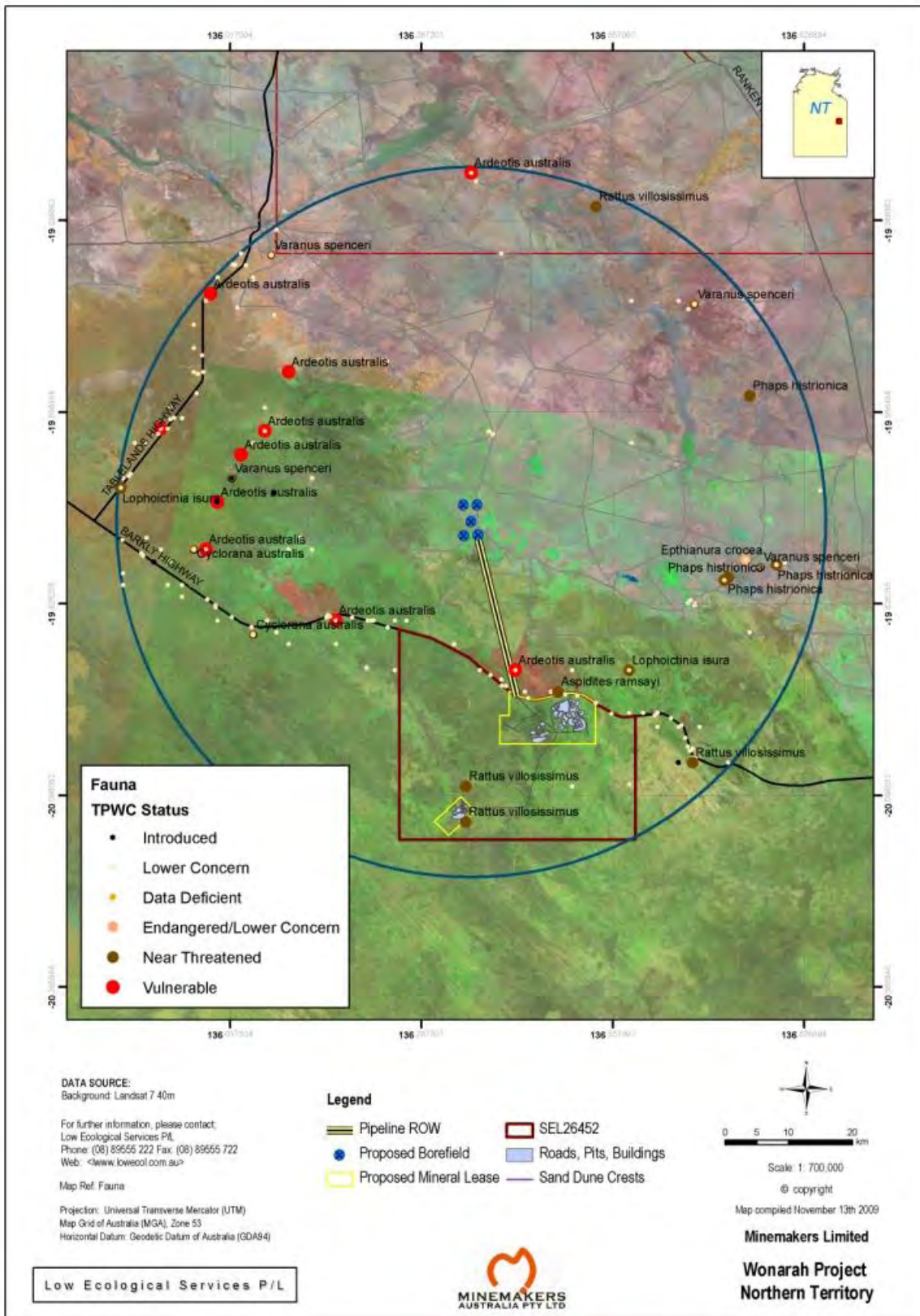
Low Ecological Services completed two fauna surveys (in the Dry Season 2008 and Wet season 2009) within SEL26452 (see Moon *et al.* 2009 for methods). This data is useful to indicate the likely occurrence of fauna species within the southern end of the pipeline where similar habitat occurs (see Figures 3, 4 and 5 for boundaries of soils, LSs and vegetation classes). The borefield and northern end of the pipeline is located in black soil plain country is was not surveyed or represented well within SEL26452.

Overall, a total of 33 birds, 15 Mammals, and 14 Reptiles were recorded during the two surveys and a full list of species identified is provided in Appendix 5.

*In general, the area surveyed did not exhibit any special features for biodiversity although one species of conservation significance (Australian bustard, *Ardeotis australis*) Vulnerable under the TPWC ACT was recorded along with one species listed as Near Threatened (northern nail-tailed wallaby, *Onychogalea unguifera*) (TPWC Act). Both of these species could occur in the pipeline area depending on seasonal conditions. Habitats in the project area, particularly the acacia shrublands and hummock grasslands are also suitable for bilby (*Macrotis lagotis*) and mulgara (*Dasyercus cristicauda* or *D. blythi*) although no sign was detected during LES surveys.*

#### 3.3.1 Introduced Species

Five introduced species were recorded within the project area during LES field surveys: three herbivores (camel, *Camelus dromedarius*, cow, *Bos taurus* and donkey, *Equus asinus*) and two omnivores (cat, *Felis catus* and fox *Vulpes vulpes*). All of these species could occur in the borefield and/or pipeline area depending on seasonal conditions.



**Figure 7:** Locations of Northern Territory Parks and Wildlife Fauna Atlas records within a 50 km radius of the proposed borefield. Species names are for records that have a status of data deficient, endangered/lower concern, near threatened or vulnerable only.

*Note: Some sites have multiple species records so this figure is a guide only. Appendix Four provides a key to conservation along with a complete list of species recorded.*

#### 4. Summary of Desktop Review

The following key issues were identified within the search area that may require management during the proposed borefield and pipeline project:

- The proposed pipeline is located within the Wonarah Beds site of botanical significance where White *et al.* (2000) identify a number of rare (but not formally listed) flora species;
- Nine flora species were listed as data deficient under the TPWC Act;
- Five flora species were listed as near threatened under the TPWC Act;
- Eleven introduced (and possibly more) flora species could occur;
- Two fauna species were listed as Vulnerable under the EPBC and/or TPWC
- Five fauna species were listed as near threatened and two as data deficient under the TPWC Act;
- Eight migratory bird species listed under the EPBC Act; and,
- Five (and possibly more) introduced fauna species could occur.

#### 5. Recommendations

Whilst the review of environmental factors did not identify any species or habitats of high ecological or conservation significance within the area surrounding the proposed borefield and pipeline, the following should be taken into consideration:

- There were very few flora or fauna records within the Black Soil Plains habitat around the borefield and this habitat type LES did not survey this habitat type in detail in SEL26452.

Where possible the pipeline ROW should divert around the following areas:

- Wetland and swamps;
- Grey clays and black soils plains (due to cracking clay construction stability issues); and,
- Any low-lying areas subject to frequent inundation with water.

During the construction and operational phase of the project the following aspects should be considered when developing the construction and environmental management plan:

- The borefield and pipeline should be built so that there is no free standing water, regardless of whether or not it is fenced off;
- The amount of trench open at any one time should be minimised;
- Lateral ramps should be installed in the trench to allow for fauna to escape;
- Trenches must be examined daily to remove any fauna trapped in the trenches;
- If any animal is caught in the trench it should be removed as soon as possible and a system of photographing and recording should be developed (note that the 1983 NT Gas Pipeline project provided some of the best fossorial fauna data in the NT);
- When closing the trench no soil mounds or trenches should be left to minimise impact on surface water flow;

- Erosion control features should be installed as necessary along with flat bottom (not V) offlet drains or diversion bunds at intervals relative to the slope;
- No winrows should be left along the pipeline or adjacent service track;
- An audit should be conducted by an experienced consultant at the start, middle and end of the project;
- A flora, fauna and landscape management induction should be given to all contractors.

## 6. References

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## 7. Appendices

7.1 **Appendix One:** Matters of Environmental Significance (Department of Environment Water Heritage and the Arts): Species of Conservation Significance listed under the Environmental Protection and Biodiversity Conservation Act (1999), (EPBC) and Territory Parks and Wildlife Conservation Act (2000) (TPWC), that occur or could possibly occur within a 50 km buffer of the proposed Borefield. Note the category “migratory” includes terrestrial, migratory marine and migratory wetland species.

Species Name and Status	Common Name	Level of Status	Present / known to occur	Preferred habitat
<b>VULNERABLE</b>				
<b>Birds</b>				
<i>Rostratula australis</i>	Australian painted snipe	EPBC	Not Recorded / known to occur in the region	Well vegetated ephemeral areas
<b>MIGRATORY – Species or species habitat may occur within the area</b>				
<b>Birds</b>				
<i>Apus pacificus</i>	fork-tailed swift	EPBC	Not Recorded / not known to occur	Boreal and temperate forests
<i>Ardea alba</i>	great egret, white egret	EPBC	Not Recorded / not known to occur	Wet areas and damp grasslands
<i>Ardea ibis</i>	cattle egret	EPBC	Not Recorded / not known to occur	Grasslands, woodlands and wetlands
<i>Charadrius veredus</i>	oriental plover	EPBC	Not Recorded / not known to occur	Timbered Habitats
<i>Glareola maldivarum</i>	oriental pratincole	EPBC	Not Recorded / not known to occur	Creeklines
<i>Merops ornatus</i>	rainbow bee-eater	EPBC	Not Recorded / not known to occur	Open forests, woodlands and shrublands, and cleared areas, usually near water. Migratory in summer.
<i>Numenius minutus</i>	little curlew, little whimbrel	EPBC	Not Recorded / not known to occur	Dry grasslands and ephemeral areas
<i>Rostratula australis</i>	Australian painted snipe	EPBC	Not Recorded / not known to occur	Well vegetated ephemeral areas



**7.2 Appendix Two:** Flora species list for the area contained within a 50 km radius of the proposed borefield based on the Northern Territory Parks and Wildlife Flora Atlas (2008) records (existing data) and status under the Commonwealth Environment Protection and Biodiversity Act (1999) (EPBC) (amended 2004), Territory Parks and Wildlife Conservation Act (2000) (TPWC) and conservation codes (SSOBS) defined by White *et al.* (2000).

Status is given under the Commonwealth Environment Protection and Biodiversity Act (1999) (EPBC) (amended 2004), Territory Parks and Wildlife Conservation Act (2000) (TPWC) and conservation codes defined by White *et al.* (2000).

**Where:**

LC = least concern (TPWC);  
 INTRO = introduced species;  
 DD = data deficient (TPWC);  
 NT = near threatened (TPWC);  
 NE = not evaluated (TPWC).

Codes and classifications (SSOBS) are defined in White *et al.* (2000), where:

1 = Poorly known taxonomic records or taxa known only from the type collection;  
 3 = Taxa with a geographic range within Australia exceeding 100 km;  
 C = Indicates that the species occurs with a conservation reserve;  
 k = These taxa have the potential to belong in a conservation category but there is presently insufficient information;  
 R = Nationally, these species are rare but not currently considered to be threatened;  
 r = Within the NT, these species are rare but not currently considered to be threatened; and  
 - = Indicates that the taxon has been recorded from a reserve but that the population size within the reserve is unknown.

**Codes for bioregions are as follows:**

BRT Burt Plain  
 CR Central Ranges  
 DMR Davenport Murchison Ranges  
 GSD Great Sandy Desert  
 MAC MacDonnell Ranges  
 SSD Simpson Strzelecki Dunefields  
 TAN Tanami

Full Name	Common Name	TPWC	EPBC	SSOBS level	SSOBS code
<i>Abelmoschus ficulneus</i>	Native Rosella				
<i>Abutilon fraseri</i> subsp. <i>fraseri</i>	Dwarf Lantern-bush				
<i>Abutilon hamii</i>					
<i>Abutilon hamii</i> subsp. <i>Erect</i> (J.Russell-Smith 7032)					
<i>Acacia acradenia</i>					
<i>Acacia adoxa</i> var. <i>adoxo</i>				bioregional	TAN (eastern range limit)
<i>Acacia ancistrocarpa</i>	Fitzroy Wattle, Pirraru				
<i>Acacia aneura</i>	Mulga				
<i>Acacia bivenosa</i>	Hill Umbrella Bush				
<i>Acacia cambagei</i>	Gidgee, Stinking Wattle				
<i>Acacia cowleana</i>	Halls Creek Wattle				
<i>Acacia drepanocarpa</i> subsp. <i>latifolia</i>					
<i>Acacia hemignosta</i>	Club-leaf Wattle			bioregional	BRT (southern range limit)
<i>Acacia hilliana</i>	Flying-saucer Bush			bioregional	CR (southern range limit)
<i>Acacia lysiphloia</i>	Turpentine, Turpentine Bush, Turpentine Wattle			bioregional	GSD (disjunct and southern range limit)
<i>Acacia melleodora</i>	Waxy Wattle				

Full Name	Common Name	TPWC	EPBC	SSOBS	SSOBS code
<i>Acacia monticola</i>	Hill Turpentine			bioregional	CR (southern range limit)
<i>Acacia sericophylla</i>	Dogwood, Wirewood				
<i>Acacia stipuligera</i>	Scrub Wattle, Kurapuka				
<i>Acacia tenuissima</i>	Broom Wattle, Minyana			bioregional	CR (disjunct)
<i>Acacia victoriae</i>	Acacia Bush, Bramble Wattle, Victoria Wattle				
<i>Aerva javanica</i>	Kapok Bush, Snow Bush				
<i>Aeschynomene indica</i>	Budda Pea, Kath Sola				
<i>Alternanthera nodiflora</i>	Common Joyweed				
<i>Alysicarpus muelleri</i>	Rough Chain-pea				
<i>Amaranthus cochleitepalus</i>				bioregional	STP (southern range limit)
<i>Amaranthus mitchellii</i>	Boggabri				
<i>Ammannia multiflora</i>	Jerry Jerry				
<i>Amphipogon caricinus</i> var. <i>caricinus</i>	Grey-beard Grass, Long Grey-beard Grass				
<i>Aristida contorta</i>	Bunched Kerosene Grass, Mulga Grass				
<i>Aristida holathera</i> var. <i>holathera</i>	Erect Kerosene Grass, White Grass, Arrow Grass				
<i>Aristida latifolia</i>	Feathertop Wiregrass				
<i>Aristida pruinosa</i>	Blue Wiregrass, Gulf Feathertop Wiregrass				
<i>Astrebla elymoides</i>	Hoop Mitchell Grass, Weeping Mitchell Grass, Slender Mitchell Grass				
<i>Astrebla pectinata</i>	Barley Mitchell Grass				
<i>Bergia ammannioides</i>	Water-fire			bioregional	BRT (apparently rare), SSD (disjunct)
<i>Bergia trimera</i>	Small Water-fire				
<i>Blumea tenella</i>					
<i>Boerhavia burbidgeana</i>				bioregional	DAV (apparently rare)
<i>Boerhavia coccinea</i>	Tar Vine				
<i>Boerhavia dominii</i>					
<i>Boerhavia paludosa</i>	Black-soil Tar Vine			bioregional	BRT (disjunct), MAC (disjunct)
<i>Bonamia alatisemina</i>		dd		national	3K
<i>Bonamia media</i> var. <i>media</i>					
<i>Bonamia pannosa</i>					
<i>Brachyachne convergens</i>	Spider Grass, False Couch, Annual Couch			bioregional	BRT (disjunct), GSD (disjunct)
<i>Cajanus marmoratus</i>					
<i>Calandrinia pumila</i>	Tiny Purslane, Tiny Parakeelya				
<i>Calotis porphyroglossa</i>	Channel Burr-daisy				
<i>Capparis lasiantha</i>	Split-arse-jack, Wait-a-whlie, Nepine, Maypan				
<i>Capparis umbonata</i>	Northern Wild Orange, Wild Orange, Bush Orange, Native Pomegranate			bioregional	MGD (southern range limit)
<i>Cassytha capillaris</i>	Hairless Dodder-laurel, Snotty Gobble				
<i>Chamaecrista symonii</i>	Dwarf Cassia				
<i>Chenopodium auricomum</i>	Northern Bluebush, Swamp Bluebush				

Full Name	Common Name	TPWC	EPBC	SSOBS	SSOBS code
<i>Chloris pectinata</i>	Comb Chloris				
<i>Chrysocephalum apiculatum</i>	Small Yellow Button, Common Everlasting, Yellow Buttons				
<i>Cleome viscosa</i>	Tickweed, Mustard Bush				
<i>Clerodendrum floribundum</i>	Smooth Clerodendrum, Smooth Spiderbush, Lollybrush, Lolly Bush				
<i>Corchorus aestuans</i>					
<i>Corchorus sidoides subsp. vermicularis</i>	Flannel Weed				
<i>Corchorus tridens</i>				bioregional	SSD (southern range limit)
<i>Corymbia aparrerinja</i>	Ghost Gum, White Gum, Desert White Gum				
<i>Corymbia deserticola subsp. mesogeotica</i>	Desert Bloodwood			bioregional	MGD (eastern range limit), TAN (northern range limit), GSD (western and southern range limits)
<i>Corymbia flavescens</i>					
<i>Crotalaria crispata</i>					
<i>Crotalaria dissitiflora</i>	Grey Rattlepod				
<i>Crotalaria medicaginea</i>	Clover-leaf Rattlepod, Trefoil Rattlepod				
<i>Crotalaria medicaginea var. neglecta</i>					
<i>Crotalaria montana</i>					
<i>Crotalaria novae-hollandiae subsp. lasiophylla</i>	New Holland Rattlepod				
<i>Croton aridus</i>				bioregional	TAN (southern range limit)
<i>Cucumis melo</i>	Bush Cucumber, Wild Cucumber, Native Cucumber, Ulcardo Melon				
<i>Cucumis melo subsp. agrestis</i>	Bush Cucumber, Wild Cucumber, Native Cucumber, Ulcardo Melon			bioregional	TAN (disjunct)
<i>Cullen cinereum</i>	Annual Verbine				
<i>Cuscuta victoriana</i>					
<i>Cyperus bifax</i>	Downs Nutgrass			bioregional	MAC (disjunct)
<i>Cyperus bulbosus</i>	Yalka, Nutgrass				
<i>Cyperus cuspidatus</i>				southern NT	(disjunct & apparently rare)
<i>Cyperus difformis</i>	Variable-leaf Sedge, Variable Flat-sedge, Dirty Dora				
<i>Cyperus gilesii</i>					
<i>Cyperus iria</i>					
<i>Cyperus victoriensis</i>					
<i>Dactyloctenium radulans</i>	Button Grass, Finger Grass, Toothbrush Grass				
<i>Dentella minutissima</i>		nt		Northern Territory	3rC-
<i>Desmodium campylocaulon</i>	Creeping Tick-trefoil			bioregional	BRT (disjunct), MAC (disjunct), TAN (disjunct)
<i>Desmodium muelleri</i>				bioregional	CHC (disjunct), TAN (disjunct and apparently rare)

Full Name	Common Name	TPWC	EPBC	SSOBS	SSOBS code
<i>Dichanthium sericeum</i>	Silky Bluegrass, Queensland Bluegrass				
<i>Dichanthium sericeum</i> subsp. <i>sericeum</i>	Silky Bluegrass, Queensland Bluegrass				
<i>Digitaria brownii</i>	Cotton Panic Grass				
<i>Digitaria ctenantha</i>	Comb Finger Grass				
<i>Distichostemon barklyanus</i>		dd		Northern Territory	3k
<i>Dodonaea coriacea</i>	Hopbush				
<i>Dolichandrone heterophylla</i>	Dohwa, Lemonwood				
<i>Eleocharis atropurpurea</i>				bioregional	GSD (disjunct and apparently rare)
<i>Elytrophorus spicatus</i>	Spikegrass				
<i>Enchylaena tomentosa</i>	Ruby Saltbush, Sturts Saltbush, Plum Puddings, Berry Cottonbush				
<i>Enneapogon pallidus</i>	Conetop Nine-awn, Pale Bottlewasher				
<i>Enneapogon polyphyllus</i>	Woolly Oat-grass, Oat-grass, Leafy Nine-awn				
<i>Enneapogon purpurascens</i>	Purple Nine-awn, Purple Bottlewasher			bioregional	TAN (southern range limit)
<i>Eragrostis desertorum</i>	Desert Lovegrass, Spreading Lovegrass				
<i>Eragrostis eriopoda</i>	Woollybutt Grass, Naked Woollybutt, Wire Wanderrie Grass, Never Fail				
<i>Eragrostis eriopoda</i> subsp. <i>Sandy fireweed</i> (P.K.Latz 12908)					
<i>Eragrostis kennedyae</i>	Small-flowered Lovegrass				
<i>Eragrostis olida</i>				bioregional	DAV (eastern range limit)
<i>Eragrostis setifolia</i>	Neverfail, Narrow-leaf Neverfail				
<i>Eragrostis tenellula</i>	Delicate Lovegrass				
<i>Eriachne aristidea</i>	Three-awn Wanderrie				
<i>Eriachne armitii</i>	Longawn Wanderrie				
<i>Eriachne ciliata</i>	Slender Wanderrie, Wiregrass				
<i>Eriachne melicacea</i>	Fire Grass			bioregional	DAV (southern range limit)
<i>Eriachne nervosa</i>	Plains Wanderrie				
<i>Eriachne obtusa</i>	Northern Wanderrie, Wiregrass				
<i>Erythrina vespertilio</i>	Bean Tree, Batswing Coral Tree				
<i>Eucalyptus barklyensis</i>				bioregional	MGD (southern range limit), DAV (apparently rare)
<i>Eucalyptus chlorophylla</i>	Green-leaf Box				
<i>Eucalyptus chlorophylla</i> subsp. <i>chlorophylla</i>					
<i>Eucalyptus coolabah</i>	Coolabah				
<i>Eucalyptus coolabah</i> subsp. <i>arida</i>	Coolabah			bioregional	TAN (tentative western range limit)
<i>Eucalyptus leucophloia</i> subsp. <i>euroa</i>	Snappy Gum, Migum				
<i>Eucalyptus odontocarpa</i>	Sturt Creek Mallee			bioregional	GSD (southern range limit)

Full Name	Common Name	TPWC	EPBC	SSOBS	SSOBS code
<i>Eucalyptus pruinosa</i> subsp. <i>pruinosa</i>	Silver Box, Silver-leaf Box, Apple Box, Smoke Tree				
<i>Eucalyptus victrix</i>	Smooth-barked Coolibah, Ghost Gum Coolibah, Gum-barked Coolibah			bioregional	MGD (eastern range limit)
<i>Eulalia aurea</i>	Silky Browntop, Sugar Grass				
<i>Euphorbia alsiniflora</i>					
<i>Euphorbia drummondii</i>	Caustic Weed, Caustic Creeper, Mat Spurge				
<i>Euphorbia stevenii</i>	Bottletree Caustic				
<i>Evolvulus alsinoides</i>	Blue Periwinkle, Tropical Speedwell				
<i>Evolvulus alsinoides</i> var. <i>decumbens</i>	Blue Periwinkle, Tropical Speedwell				
<i>Evolvulus alsinoides</i> var. <i>villosicalyx</i>	Blue Periwinkle, Tropical Speedwell				
<i>Exocarpos sparteus</i>	Slender Cherry, Broombush			bioregional	DAV (northern range limit)
<i>Fimbristylis ammobia</i>				bioregional	MGD (eastern range limit)
<i>Fimbristylis microcarya</i>					
<i>Fimbristylis oxystachya</i>	Iukarrara				
<i>Flaveria australasica</i>	Yellow Twin Stem, Speedy Weed				
<i>Flueggea virosa</i> subsp. <i>melanthesoides</i>	White Grape, White Berry Bush, White Raisin, White Currant			bioregional	GSD (disjunct)
<i>Gomphrena breviflora</i>					
<i>Gomphrena conica</i>					
<i>Gomphrena lanata</i>					
<i>Goodenia armitiana</i>	Narrow-leaved Goodenia				
<i>Goodenia fascicularis</i>	Silky Goodenia				
<i>Goodenia heterochila</i>	Serrated Goodenia				
<i>Goodenia ramelii</i>					
<i>Goodenia strangfordii</i>				bioregional	MGD (southern range limit)
<i>Gossypium australe</i>	Native Cotton, Tall Desert Rose				
<i>Grevillea dryandri</i> subsp. <i>dryandri</i>	Dryanders Grevillea				
<i>Grevillea refracta</i>	Silver-leaf Grevillea				
<i>Grevillea refracta</i> subsp. <i>refracta</i>	Silver-leaf Grevillea				
<i>Grevillea wickhamii</i> subsp. <i>aprica</i>	Holly-leaf Grevillea			bioregional	CR (southern range limit)
<i>Hakea macrocarpa</i>	Flat-leaved Hakea			bioregional	SSD (southern range limit)
<i>Haloragis glauca</i> forma <i>glauca</i>	Grey Raspwort				
<i>Haloragis uncatipila</i>					
<i>Heliotropium ballii</i>		dd		Northern Territory	3k
<i>Heliotropium brachythrix</i>					
<i>Heliotropium conocarpum</i>	White Heliotrope				
<i>Heliotropium haesum</i>					
<i>Heliotropium ovalifolium</i>					
<i>Heliotropium pulvinum</i>		dd		Northern Territory	3K
<i>Heliotropium tanythrix</i>					

Full Name	Common Name	TPWC	EPBC	SSOBS	SSOBS code
<i>Heteropogon contortus</i>	Bunch Speargrass, Black Speargrass				
<i>Hibiscus leptocladus</i>	Variable-leaf Hibiscus				
<i>Hibiscus sturtii</i> var. <i>campylochlamys</i>	Sturts Hibiscus				
<i>Hibiscus sturtii</i> var. <i>platychlamys</i>	Sturts Hibiscus				
<i>Hibiscus trionum</i> var. <i>vesicarius</i>	Bladder Ketmia			bioregional	SSD (disjunct and southern range limit), BRT (disjunct)
<i>Indigastrum parviflorum</i>	Small-flower Indigo				
<i>Indigofera colutea</i>	Sticky Indigo				
<i>Indigofera linifolia</i>	Native Indigo				
<i>Indigofera linnaei</i>	Birdsville Indigo, Nine-leaved Indigo				
<i>Indigofera trita</i>				bioregional	BRT (disjunct)
<i>Ipomoea coptica</i>					
<i>Ipomoea costata</i>	Bush Potato, Potato Vine, Desert Yam				
<i>Ipomoea lonchophylla</i>	Common Cowvine			bioregional	BRT (disjunct), SSD (disjunct)
<i>Ipomoea plebeia</i>	Bellvine			southern NT	(apparently rare)
<i>Ipomoea polymorpha</i>	Silky Cowvine				
<i>Iseilema membranaceum</i>	Small Flinders Grass				
<i>Iseilema vaginiflorum</i>	Red Flinders Grass				
<i>Iseilema windsorii</i>	Scented Flinders Grass				
<i>Isoetes muelleri</i>	Quillwort			bioregional	DAV (disjunct and apparently rare)
<i>Jatropha gossypifolia</i>	Cotton-leaf Physic Nut, Bellyache Bush				
<i>Keraudrenia nephrosperma</i>					
<i>Leptochloa fusca</i> subsp. <i>fusca</i>	Small-flowered Beetle Grass				
<i>Lipocarpha microcephala</i>	Button Rush				
<i>Lysiana spathulata</i>	Flat-leaved Mistletoe				
<i>Maireana villosa</i>	Silky Bluebush				
<i>Malvastrum americanum</i>	Malvastrum, Spiked Malvastrum				
<i>Marsilea angustifolia</i>					
<i>Marsilea crenata</i>				southern NT	(disjunct)
<i>Melaleuca viridiflora</i>	Green Paperbark, Broad-leaved Paperbark, Large-leaved Paperbark				
<i>Melhanian oblongifolia</i>	Velvet Hibiscus				
<i>Melochia pyramidata</i>					
<i>Merremia davenportii</i>	White Morning Glory			bioregional	BRT (southern range limit)
<i>Minuria integerrima</i>	Smooth Minuria				
<i>Mirbelia viminalis</i>	Yellow Broom				
<i>Muehlenbeckia florulenta</i>	Lignum, Tangled Lignum			bioregional	TAN (apparently rare)
<i>Mukia maderaspatana</i>	Head-ache Vine				
<i>Najas marina</i>	Prickly Waternymph, Prickly Naiad	nt		Northern Territory	3rC-
<i>Najas tenuifolia</i>	Waternymph, Thin-leaved Naiad			southern NT	(disjunct)

Full Name	Common Name	TPWC	EPBC	SSOBS	SSOBS code
<i>Neptunia dimorphantha</i>	Sensitive Plant, Nervous Plant				
<i>Oldenlandia argillacea</i>				bioregional	MGD (apparently rare), TAN (apparently rare), BRT (disjunct)
<i>Oldenlandia mitrasacmoides</i>					
<i>Operculina aequisejala</i>				bioregional	CHC (southern range limit), TAN (disjunct and apparently rare)
<i>Ophiuros exaltatus</i>					
<i>Panicum decompositum</i>	Native Millet, Native Panic, Australian Millet				
<i>Panicum laevinode</i>	Pepper Grass				
<i>Paraneurachne muelleri</i>	Spinifex Couch, Northern Mulga Grass				
<i>Paspalidium retiglume</i>				bioregional	MGD (southern range limit)
<i>Pennisetum basedowii</i>	Asbestos Grass	dd		Northern Territory	3k
<i>Perotis rara</i>	Comet Grass				
<i>Petalostylis cassioides</i>	Butterfly Bush, Petalostylis				
<i>Phyllanthus maderaspatensis</i> var. <i>angustifolius</i>					
<i>Polycarpaea corymbosa</i>					
<i>Polygala</i> sp. Davenport Range (C.R.Dunlop 6042)				bioregional	BRT (apparently rare), TAN (western range limit)
<i>Polygala</i> sp. Tennant Creek (J.L.Egan 2299)					
<i>Portulaca filifolia</i>	Slender Pigweed				
<i>Portulaca oleracea</i>	Pigweed, Common Purslane, Munyeroo				
<i>Potamogeton pectinatus</i>	Fennel Pondweed, Sago Pondweed	nt		Northern Territory	3r
<i>Prosopis pallida</i>	Mesquite, Algaroba				
<i>Psyrax attenuata</i> var. <i>myrmecophila</i>					
<i>Psyrax attenuata</i> var. <i>myrmecophila</i> forma <i>myrmecophila</i>					
<i>Pterocaulon serrulatum</i> var. <i>serrulatum</i>	Fruit-salad Bush, Apple Bush				
<i>Ptilotus calostachyus</i> var. <i>calostachyus</i>	Weeping Mulla Mulla				
<i>Ptilotus clementii</i>	Limestone Pussycats Tails, Tassel Top				
<i>Ptilotus fusiformis</i>	Skeleton plant				
<i>Ptilotus obovatus</i> var. <i>obovatus</i>	Smoke Bush, Silver Bush, Silver Tails				
<i>Ptilotus polystachyus</i>	Long Pussy-tails				
<i>Ptilotus polystachyus</i> var. <i>polystachyus</i>	Long Pussy-tails				
<i>Ptilotus spicatus</i>					
<i>Rhynchosia minima</i>	Native Pea, Rhynchosia				
<i>Rothia indica</i> subsp. <i>australis</i>				southern NT	(disjunct and apparently rare)
<i>Salsola tragus</i>	Buckbush, Rolypoly, Tumbleweed				
<i>Salsola tragus</i> subsp. <i>tragus</i>	Buckbush, Rolypoly,				

Full Name	Common Name	TPWC	EPBC	SSOBS	SSOBS code
	Tumbleweed				
<i>Santalum lanceolatum</i>	Plumbush, Wild Plum				
<i>Sauropus trachyspermus</i>	Slender Spurge				
<i>Scaevola glabrata</i>					
<i>Scaevola ovalifolia</i>	Bushy Fanflower			bioregional	GSD (western range limit)
<i>Schoenoplectus dissachanthus</i>					
<i>Schoenoplectus laevis</i>				bioregional	FIN (disjunct and apparently rare)
<i>Sclerolaena bicornis var. bicornis</i>	Goathead Burr, Bassia Burr				
<i>Sclerolaena lanicuspis</i>	Woolly Copper Burr				
<i>Sebastiania chamaelea</i>					
<i>Senecio depressicola</i>		dd		Northern Territory	3k
<i>Senna artemisioides subsp. alicia</i>					
<i>Senna artemisioides subsp. filifolia</i>	Desert Cassia, Broom Bush, Puntly Bush				
<i>Senna artemisioides subsp. oligophylla</i>	Oval-leaf Cassia				
<i>Senna costata</i>					
<i>Senna glutinosa subsp. pruinosa</i>					
<i>Senna notabilis</i>	Cockroach Bush				
<i>Sesbania brachycarpa</i>					
<i>Sesbania chippendalei</i>					
<i>Sesbania simpliciuscula</i>		dd		Northern Territory	3k
<i>Sida cunninghamii</i>					
<i>Sida fibulifera</i>	Silver Sida, Pin Sida				
<i>Sida filiformis s.lat.</i>	Fire Sida, Fine Sida				
<i>Sida platycalyx</i>	Lifesaver Burr, Teddy Bears Arsehole				
<i>Sida spenceriana</i>				bioregional	FIN (apparently rare and eastern range limit)
<i>Sida spinosa</i>	Spiny Sida				
<i>Sida trichopoda</i>	High Sida, Narrow-leaf Sida				
<i>Solanum chippendalei</i>	Bush Tomato, Ngaru				
<i>Solanum quadriloculatum</i>	Wild Tomato, Tomato Bush				
<i>Solanum tumulicola</i>	Black-soil Wild Tomato				
<i>Spathia neurosa</i>	Spathe Grass				
<i>Spermacoce hillii</i>					
<i>Sphaeranthus indicus</i>					
<i>Sporobolus australasicus</i>	Australian Dropseed				
<i>Sporobolus latzii</i>		dd		national	1K
<i>Sporobolus mitchellii</i>	Rat-tail Couch, Swamp Rat-tail Grass, Short Rat-tail Grass				
<i>Streptoglossa adscendens</i>					
<i>Streptoglossa macrocephala</i>	Large-flowered Aromatic Daisy				
<i>Swainsona burkei</i>				bioregional	TAN (western range limit)
<i>Tephrosia lasiochlaena</i>				bioregional	MAC (southern range limit)
<i>Tephrosia sp. Barrow Creek (G.M.Chippendale 921)</i>				bioregional	GSD (southern range limit)



Full Name	Common Name	TPWC	EPBC	SSOBS	SSOBS code
<i>Tephrosia</i> sp. Willowra (G.M.Chippendale 4809)					
<i>Tephrosia stuartii</i>				bioregional	DAV (eastern range limit)
<i>Teucrium integrifolium</i>	Green Germander			bioregional	TAN (disjunct and western range limit)
<i>Themeda triandra</i>	Kangaroo Grass				
<i>Tragus australianus</i>	Small Burr-grass, Sock Grass, Tickgrass				
<i>Trianthema pilosa</i>					
<i>Trianthema triquetra</i>	Red Spinach				
<i>Tribulopsis angustifolia</i>					
<i>Tribulus eichlerianus</i>	Bindieye				
<i>Tribulus terrestris</i> s.lat.	Cat-head, Caltrop, Bindieye				
<i>Trichodesma zeylanicum</i>	Cattle Bush, Camel Bush				
<i>Triodia pungens</i>	Soft Spinifex, Gummy Spinifex				
<i>Triodia schinzii</i>	Feathertop Spinifex				
<i>Triraphis mollis</i>	Purple Plumegrass, Purple Heads, Needle Grass				
<i>Triumfetta centralis</i>				bioregional	SSD (eastern range limit)
<i>Triumfetta deserticola</i>		dd		Northern Territory	3k
<i>Urochloa piligera</i>	Hairy Armgrass, Hairy Summer Grass, Green Summer Grass				
<i>Urochloa praetervisa</i>	Large Armgrass, Large Summer Grass				
<i>Vachellia sutherlandii</i>	Barklys Wattle				
<i>Ventilago viminalis</i>	Supplejack, Vine Tree				
<i>Vigna lanceolata</i>	Pencil Yam, Maloga Bean, Parsnip Bean				
<i>Wedelia asperima</i>	Sunflower Daisy				
<i>Whiteochloa cymbiformis</i>					
<i>Yakirra australiensis</i> var. <i>australiensis</i>	Desert Flinders Grass				
<i>Zaleya galericulata</i> subsp. <i>galericulata</i>	Hogweed				
<i>Zornia albiflora</i>				bioregional	GSD (southern range limit)

**7.3 Appendix Three:** Flora recorded during on site investigations by Low Ecological Services in 2008 and 2009 within the Wonarah prospect (SEL26452)

See Appendix Two for Conservation Codes

Full Name	Common Name	TPWC	EPBC	SSOBS level	SSOBS code
<i>Abutilon otocarpum</i>	Keeled Lantern-bush, Desert Chinese Lantern, Desert Lantern				
<i>Acacia adoxa</i>					
<i>Acacia ancistrocarpa</i>	Fitzroy Wattle, Pirraru				
<i>Acacia hemignosta</i>	Club-leaf Wattle			bioregional	BRT (southern range limit)
<i>Acacia hilliana</i>	Flying-saucer Bush			bioregional	CR (southern range limit)
<i>Acacia lysiphloia</i>	Turpentine, Turpentine Bush, Turpentine Wattle			bioregional	GSD (disjunct and southern range limit)
<i>Acacia monticola</i>	Hill Turpentine			bioregional	CR (southern range limit)
<i>Acacia sericophylla</i>	Dogwood, Wirewood				
<i>Acacia stipuligera</i>	Scrub Wattle, Kurapuka				
<i>Aerva javanica</i>	Kapok Bush, Snow Bush	INTRO			
<i>Aeschynomene indica</i>	Budda Pea, Kath Sola				
<i>Ammannia multiflora</i>	Jerry Jerry				
<i>Amphipogon caricinus</i>	Grey-beard Grass, Long Grey-beard Grass				
<i>Aristida contorta</i>	Bunched Kerosene Grass, Mulga Grass				
<i>Aristida holathera</i>	Erect Kerosene Grass, White Grass, Arrow Grass				
<i>Aristida inaequiglumis</i>	Curly Wiregrass, Fire Grass, Unequal Three-awn				
<i>Astrelba pectinata</i>	Barley Mitchell Grass				
<i>Atalaya hemiglauca</i>	Whitewood				
<i>Atriplex elachophylla</i>	Annual Saltbush, Saltbush				
<i>Bergia barklyana</i>		nt		national	3R
<i>Boerhavia coccinea</i>	Tar Vine				
<i>Brunonia australis</i>	Pincushion, Blue Pincushion				
<i>Bulbostylis barbata</i>	Short-leaved Rush				
<i>Capparis umbonata</i>	Northern Wild Orange, Wild Orange, Bush Orange, Native Pomegranate			bioregional	MGD (southern range limit)
<i>Carissa lanceolata</i>	Conkerberry, Conkle Berry, Kungsberry Bush				
<i>Cassytha capillaris</i>	Hairless Dodder-laurel, Snotty Gobble				
<i>Cenchrus ciliaris</i>	Buffel Grass	INTRO			

Full Name	Common Name	TPWC	EPBC	SSOBS level	SSOBS code
<i>Chrysopogon fallax</i>	Golden Beard Grass, Ribbon Grass, Weeping Grass, Spear Grass				
<i>Cleome viscosa</i>	Tickweed, Mustard Bush				
<i>Clerodendrum floribundum</i>	Smooth Clerodendrum, Smooth Spiderbush, Lollybrush, Lolly Bush				
<i>Corchorus sidoides</i>	Flannel Weed				
<i>Corymbia opaca</i>	Bloodwood				
<i>Corymbia setosa</i>	Rough-leaved Bloodwood				
<i>Crotalaria medicaginea</i>	Clover-leaf Rattlepod, Trefoil Rattlepod				
<i>Crotalaria novae-hollandiae</i>	New Holland Rattlepod				
<i>Cucumis maderaspatanus</i>	Head-ache Vine				
<i>Dactyloctenium radulans</i>	Button Grass, Finger Grass, Toothbrush Grass				
<i>Dicrastylis gilesii</i>					
<i>Digitaria brownii</i>	Cotton Panic Grass				
<i>Dodonaea coriacea</i>	Hopbush				
<i>Ehretia saligna</i>	Coonta, False Cedar, Peachwood, Peachbush				
<i>Enneapogon polyphyllus</i>	Woolly Oat-grass, Oat-grass, Leafy Nine-awn				
<i>Eragrostis cumingii</i>	Fairy Grass, Cumings Lovegrass				
<i>Eragrostis eriopoda</i>	Woollybutt Grass, Naked Woollybutt, Wire Wanderrie Grass, Never Fail				
<i>Eragrostis falcata</i>	Sickle Lovegrass				
<i>Eremophila latrobei</i>	Native Fuchsia, Latrobes Desert Fuchsia, Georgina Poison Bush				
<i>Eremophila longifolia</i>	Emu Bush, Weeping Emu Bush, Long-leaved Desert Fuchsia				
<i>Eriachne aristidea</i>	Three-awn Wanderrie				
<i>Eriachne mucronata</i>	Mountain Wanderrie				
<i>Eucalyptus gamophylla</i>	Blue Mallee, Twin-leaved Mallee, Blue-leaved Mallee			bioregional	TAN (northern range limit)
<i>Eucalyptus leucophloia</i>	Snappy Gum, Migum				
<i>Eucalyptus microtheca</i>	Coolibah				
<i>Eucalyptus odontocarpa</i>	Sturt Creek Mallee			bioregional	GSD (southern range limit)
<i>Eucalyptus pachyphylla</i>	Red-bud Mallee			bioregional	DMR (northern range limit)
<i>Eucalyptus pruinosa</i>	Silver Box, Silver-leaf Box,				

Full Name	Common Name	TPWC	EPBC	SSOBS level	SSOBS code
	Apple Box, Smoke Tree				
<i>Eucalyptus victrix</i>	Smooth-barked Coolibah, Ghost Gum Coolibah, Gum-barked Coolibah			bioregional	MGD (eastern range limit)
<i>Eulalia aurea</i>	Silky Browntop, Sugar Grass				
<i>Euphorbia comans</i>					
<i>Euphorbia tannensis</i>	Caustic Bush, Desert Spurge				
<i>Evolvulus alsinoides var. decumbens</i>	Blue Periwinkle, Tropical Speedwell				
<i>Evolvulus alsinoides var. villosicalyx</i>	Blue Periwinkle, Tropical Speedwell				
<i>Fimbristylis ammobia</i>				bioregional	MGD (eastern range limit)
<i>Fimbristylis dichotoma</i>	Eight Day Grass, Common Fringe-rush				
<i>Fimbristylis oxystachya</i>	Lukarrara				
<i>Fimbristylis simulans</i>				bioregional	DMR (eastern range limits)
<i>Gomphrena lanata</i>					
<i>Goodenia armitiana</i>	Narrow-leaved Goodenia				
<i>Goodenia ramelii</i>					
<i>Gossypium australe</i>	Native Cotton, Tall Desert Rose				
<i>Gossypium sturtianum</i>	Sturts Desert Rose				
<i>Grevillea juncifolia</i>	Desert Grevillea, Honey Grevillea, Honeysuckle Grevillea				
<i>Grevillea refracta</i>	Silver-leaf Grevillea				
<i>Grevillea wickhamii</i>	Holly-leaf Grevillea				
<i>Hakea lorea</i>	Long-leaf Corkwood, Corkbark Tree				
<i>Hakea macrocarpa</i>	Flat-leaved Hakea			bioregional	SSD (southern range limit)
<i>Heliotropium glanduliferum</i>					
<i>Heliotropium ovalifolium</i>					
<i>Heliotropium pulvinum</i>		dd		Northern Territory	3K
<i>Hibiscus brachychlaenus</i>		nt		Northern Territory	3r
<i>Hybanthus aurantiacus</i>	Orange Spade Flower				
<i>Indigofera colutea</i>	Sticky Indigo				
<i>Indigofera linifolia</i>	Native Indigo				
<i>Indigofera linnaei</i>	Birdsville Indigo, Nine-leaved Indigo				
<i>Ipomoea costata</i>	Bush Potato, Potato Vine, Desert Yam				
<i>Jacquemontia browniana</i>	Snake Stem				

Full Name	Common Name	TPWC	EPBC	SSOBS level	SSOBS code
<i>Keraudrenia integrifolia</i>					
<i>Leptochloa fusca</i>	Beetle Grass				
<i>Marsdenia australis</i>	Bush Banana, Lungkwa, Doubah				
<i>Melaleuca lasiandra</i>	Sandhill Tea-tree				
<i>Melaleuca viridiflora</i>	Green Paperbark, Broad-leaved Paperbark, Large-leaved Paperbark				
<i>Mirbelia viminalis</i>	Yellow Broom				
<i>Neptunia gracilis</i>	Native sensitive grass				
<i>Pandorea doratoxylon</i>	Spearwood, Wonga Vine, Spearbush				
<i>Paraneurachne muelleri</i>	Spinifex Couch, Northern Mulga Grass				
<i>Paspalidium rarum</i>	Bunch Paspalidium				
<i>Petalostylis cassioides</i>	Butterfly Bush, Petalostylis				
<i>Polycarpaea spirostylis</i>	Copper Plant				
<i>Portulaca filifolia</i>	Slender Pigweed				
<i>Portulaca oleracea</i>	Pigweed, Common Purslane, Munyeroo				
<i>Psydrax latifolia</i>	Native Currant, Orange Bush				
<i>Ptilotus calostachyus</i>	Weeping Mulla Mulla				
<i>Ptilotus fusiformis</i>	Skeleton plant				
<i>Ptilotus polystachyus</i>	Long Pussy-tails				
<i>Rhynchosia minima</i>	Native Pea, Rhynchosia				
<i>Rulingia loxophylla</i>	Desert Fire Weed				
<i>Salsola tragus</i>	Buckbush, Rolypoly, Tumbleweed				
<i>Santalum lanceolatum</i>	Plumbush, Wild Plum				
<i>Scaevola amblyanthera</i>					
<i>Scaevola ovalifolia</i>	Bushy Fanflower			bioregional	GSD (western range limit)
<i>Scaevola parvifolia</i>	Fanflower				
<i>Sclerolaena costata</i>				bioregional	CHC (eastern range limit)
<i>Schizachyrium fragile</i>	Firegrass, Red Spathe Grass, Small Red-leaf				
<i>Sebastiania chamaelea</i>					
<i>Senna artemisioides subsp. oligophylla</i>	Oval-leaf Cassia				
<i>Senna notabilis</i>	Cockroach Bush				

Full Name	Common Name	TPWC	EPBC	SSOBS level	SSOBS code
<i>Senna venusa</i>	Graceful Cassia				
<i>Setaria surgens</i>	Brown Pigeon Grass			bioregional	GSD (southern range limit)
<i>Sida arenicola</i>					
<i>Sida fibulifera</i>	Silver Sida, Pin Sida				
<i>Sida filiformis</i>	Fire Sida, Fine Sida				
<i>Solanum coactiliferum</i>	Western Nightshade				
<i>Spermacoce dolichosperma</i>					
<i>Stackhousia 'Mt Leibig'</i>					
<i>Swainsonia sp.</i>					
<i>Tephrosia benthamii</i>					
<i>Tephrosia brachyodon</i>	Red Pea-bush				
<i>Tephrosia lasiochlaena</i>				bioregional	MAC (southern range limit)
<i>Teucrium integrifolium</i>	Green Germander			bioregional	TAN (disjunct and western range limit)
<i>Trianthema pilosa</i>					
<i>Trianthema triquetra</i>	Red Spinach				
<i>Tribulopsis angustifolia</i>					
<i>Tribulus eichlerianus</i>	Bindieye				
<i>Trichodesma zeylanicum</i>	Cattle Bush, Camel Bush				
<i>Triodia intermedia</i>	Winged Spinifex			bioregional	DMR (disjunct and eastern range limit), BRT (disjunct and southern range limit)
<i>Triodia pungens</i>	Soft Spinifex, Gummy Spinifex				
<i>Triodia schinzii</i>	Feathertop Spinifex				
<i>Triraphis mollis</i>	Purple Plumegrass, Purple Heads, Needle Grass				
<i>Triumfetta centralis</i>				bioregional	SSD (eastern range limit)
<i>Urochloa sp.</i>					
<i>Ventilago viminalis</i>	Supplejack, Vine Tree				
<i>Waltheria indica</i>					
<i>Whiteochloa airoides</i>					
<i>Yakirra australiensis</i>	Desert Flinders Grass				
<i>Zornia albiflora</i>				bioregional	GSD (southern range limit)

**7.4 Appendix Four:** Fauna species list for the area contained within a 50 km radius of the proposed borefield based on the Northern Territory Parks and Wildlife Fauna Atlas (2007) records (existing data) and status under the Commonwealth Environment Protection and Biodiversity Act (1999) (EPBC) (amended 2004) and Territory Parks and Wildlife Conservation Act (2000) (TPWC).

Where:

LC = lower concern

DD = data deficient

VU = vulnerable

EN = endangered

NT = near threatened

INT = introduced

NL = near listed

Group	Species Name	TPWC	EPBC
Bird	<i>Acanthagenys rufogularis</i>	LC	
Bird	<i>Acanthiza apicalis</i>	LC	
Bird	<i>Accipiter cirrhocephalus</i>	LC	
Bird	<i>Accipiter fasciatus</i>	LC	
Bird	<i>Actitis hypoleucos</i>	LC	
Bird	<i>Aegotheles cristatus</i>	LC	
Bird	<i>Anas gracilis</i>	LC	
Bird	<i>Anas superciliosa</i>	LC	
Bird	<i>Anthus novaeseelandiae</i>	LC	
Bird	<i>Aquila audax</i>	LC	
Bird	<i>Ardea alba</i>	LC	
Bird	<i>Ardea pacifica</i>	LC	
Bird	<i>Ardeotis australis</i>	VU	
Bird	<i>Artamus cinereus</i>	LC	
Bird	<i>Artamus personatus</i>	LC	
Bird	<i>Artamus superciliosus</i>	LC	
Bird	<i>Cacatua roseicapilla</i>	LC	
Bird	<i>Cacatua sanguinea</i>	LC	
Bird	<i>Certhionyx niger</i>	LC	
Bird	<i>Certhionyx variegatus</i>	LC	
Bird	<i>Chalcites basalis</i>	LC	
Bird	<i>Chlidonias hybridus</i>	LC	
Bird	<i>Cincloramphus cruralis</i>	LC	
Bird	<i>Cincloramphus mathewsi</i>	LC	
Bird	<i>Circus approximans</i>	LC	
Bird	<i>Circus assimilis</i>	LC	
Bird	<i>Colluricincla harmonica</i>	LC	
Bird	<i>Coracina maxima</i>	LC	
Bird	<i>Coracina novaehollandiae</i>	LC	

Group	Species Name	TPWC	EPBC
Bird	<i>Corvus bennetti</i>	LC	
Bird	<i>Corvus coronoides</i>	LC	
Bird	<i>Corvus orru</i>	LC	
Bird	<i>Cracticus nigrogularis</i>	LC	
Bird	<i>Daphoenositta chrysoptera</i>	LC	
Bird	<i>Dendrocygna eytoni</i>	LC	
Bird	<i>Dicaeum hirundinaceum</i>	LC	
Bird	<i>Egretta garzetta</i>	LC	
Bird	<i>Egretta novaehollandiae</i>	LC	
Bird	<i>Elanus axillaris</i>	LC	
Bird	<i>Elanus scriptus</i>	LC	
Bird	<i>Elseyornis melanops</i>	LC	
Bird	<i>Emblema pictum</i>	LC	
Bird	<i>Epthianura crocea</i>	EN\LC	VU\NL
Bird	<i>Epthianura crocea crocea</i>	LC	
Bird	<i>Epthianura tricolor</i>	LC	
Bird	<i>Erythrogonys cinctus</i>	LC	
Bird	<i>Eurostopodus argus</i>	LC	
Bird	<i>Falco berigora</i>	LC	
Bird	<i>Falco cenchroides</i>	LC	
Bird	<i>Falco longipennis</i>	LC	
Bird	<i>Falco peregrinus</i>	LC	
Bird	<i>Falco subniger</i>	LC	
Bird	<i>Fulica atra</i>	LC	
Bird	<i>Geopelia cuneata</i>	LC	
Bird	<i>Geopelia placida</i>	LC	
Bird	<i>Grallina cyanoleuca</i>	LC	
Bird	<i>Grus rubicunda</i>	LC	
Bird	<i>Gymnorhina tibicen</i>	LC	
Bird	<i>Haliastur sphenurus</i>	LC	
Bird	<i>Hamirostra melanosternon</i>	LC	
Bird	<i>Hieraaetus morphnoides</i>	LC	
Bird	<i>Himantopus himantopus</i>	LC	
Bird	<i>Hirundo ariel</i>	LC	
Bird	<i>Hirundo nigricans</i>	LC	
Bird	<i>Lalage sueurii</i>	LC	
Bird	<i>Lichenostomus flavescens</i>	LC	
Bird	<i>Lichenostomus keartlandi</i>	LC	
Bird	<i>Lichenostomus penicillatus</i>	LC	
Bird	<i>Lichenostomus plumulus</i>	LC	
Bird	<i>Lichenostomus virescens</i>	LC	
Bird	<i>Lichmera indistincta</i>	LC	
Bird	<i>Lophoictinia isura</i>	NT	
Bird	<i>Malacorhynchus membranaceus</i>	LC	



Group	Species Name	TPWC	EPBC
Bird	<i>Malurus lamberti</i>	LC	
Bird	<i>Malurus leucopterus</i>	LC	
Bird	<i>Malurus melanocephalus</i>	LC	
Bird	<i>Manorina flavigula</i>	LC	
Bird	<i>Melanodryas cucullata picata/westralensis</i>	LC	
Bird	<i>Melithreptus gularis</i>	LC	
Bird	<i>Melopsittacus undulatus</i>	LC	
Bird	<i>Merops ornatus</i>	LC	
Bird	<i>Milvus migrans</i>	LC	
Bird	<i>Mirafra javanica</i>	LC	
Bird	<i>Neopsephotus bourkii</i>	LC	
Bird	<i>Nymphicus hollandicus</i>	LC	
Bird	<i>Ocyphaps lophotes</i>	LC	
Bird	<i>Oreoica gutturalis</i>	LC	
Bird	<i>Pachycephala rufiventris</i>	LC	
Bird	<i>Pardalotus rubricatus</i>	LC	
Bird	<i>Pardalotus striatus</i>	LC	
Bird	<i>Passer domesticus</i>	(Int)	
Bird	<i>Pelecanus conspicillatus</i>	LC	
Bird	<i>Petroica goodenovii</i>	LC	
Bird	<i>Phalacrocorax melanoleucos</i>	LC	
Bird	<i>Phaps chalcoptera</i>	LC	
Bird	<i>Phaps histrionica</i>	NT	
Bird	<i>Platalea flavipes</i>	LC	
Bird	<i>Platalea regia</i>	LC	
Bird	<i>Plegadis falcinellus</i>	LC	
Bird	<i>Podargus strigoides</i>	LC	
Bird	<i>Pomatostomus temporalis</i>	LC	
Bird	<i>Porphyrio porphyrio</i>	LC	
Bird	<i>Rhipidura leucophrys</i>	LC	
Bird	<i>Smicronis brevirostris</i>	LC	
Bird	<i>Sterna nilotica</i>	LC	
Bird	<i>Stiltia isabella</i>	LC	
Bird	<i>Tachybaptus novaehollandiae</i>	LC	
Bird	<i>Taeniopygia bichenovii</i>	LC	
Bird	<i>Taeniopygia guttata</i>	LC	
Bird	<i>Threskiornis spinicollis</i>	LC	
Bird	<i>Todiramphus pyrrhopygia</i>	LC	
Bird	<i>Tringa nebularia</i>	LC	
Bird	<i>Tringa stagnatilis</i>	LC	
Bird	<i>Turnix pyrrhorthorax</i>	LC	
Bird	<i>Turnix velox</i>	LC	
Bird	<i>Tyto alba</i>	LC	
Bird	<i>Vanellus miles</i>	LC	

Group	Species Name	TPWC	EPBC
Bird	<i>Vanellus tricolor</i>	LC	
Frog	<i>Cyclorana australis</i>	DD	
Frog	<i>Cyclorana maculosa</i>	LC	
Frog	<i>Notaden nichollsi</i>	LC	
Frog	<i>Uperoleia trachyderma</i>	LC	
Mammal	<i>Bos taurus</i>	(Int)	
Mammal	<i>Canis lupus</i>	LC	
Mammal	<i>Felis catus</i>	(Int)	
Mammal	<i>Leggadina forresti</i>	LC	
Mammal	<i>Macropus rufus</i>	LC	
Mammal	<i>Notomys alexis</i>	LC	
Mammal	<i>Oryctolagus cuniculus</i>	(Int)	
Mammal	<i>Planigale ingrami</i>	LC	
Mammal	<i>Pseudomys desertor</i>	LC	
Mammal	<i>Pseudomys hermannsburgensis</i>	LC	
Mammal	<i>Rattus villosissimus</i>	NT	
Mammal	<i>Sminthopsis macroura</i>	LC	
Mammal	<i>Sminthopsis youngsoni</i>	LC	
Mammal	<i>Vulpes vulpes</i>	(Int)	
Reptile	<i>Antaresia stimsoni</i>	LC	
Reptile	<i>Aspidites melanocephalus</i>	LC	
Reptile	<i>Aspidites ramsayi</i>	NT	
Reptile	<i>Carlia munda</i>	LC	
Reptile	<i>Carlia triacantha</i>	LC	
Reptile	<i>Cryptoblepharus plagiocephalus</i>	LC	
Reptile	<i>Ctenophorus isolepis</i>	LC	
Reptile	<i>Ctenophorus nuchalis</i>	LC	
Reptile	<i>Ctenotus grandis</i>	LC	
Reptile	<i>Ctenotus greeri</i>	LC	
Reptile	<i>Ctenotus helenae</i>	LC	
Reptile	<i>Ctenotus joanae</i>	LC	
Reptile	<i>Ctenotus leonhardii</i>	LC	
Reptile	<i>Ctenotus pantherinus</i>	LC	
Reptile	<i>Delma tinctoria</i>	LC	
Reptile	<i>Diplodactylus conspicillatus</i>	LC	
Reptile	<i>Diplodactylus immaculatus</i>	LC	
Reptile	<i>Diplodactylus stenodactylus</i>	LC	
Reptile	<i>Diplodactylus tessellatus</i>	LC	
Reptile	<i>Diporiphora lalliae</i>	LC	
Reptile	<i>Egernia stokesii</i>	LC	
Reptile	<i>Gehyra minuta</i>	LC	
Reptile	<i>Gehyra variegata</i>	LC	
Reptile	<i>Heteronotia binoei</i>	LC	
Reptile	<i>Lerista bipes</i>	LC	

Group	Species Name	TPWC	EPBC
Reptile	<i>Lerista xanthura</i>	LC	
Reptile	<i>Lialis burtonis</i>	LC	
Reptile	<i>Menetia greyii</i>	LC	
Reptile	<i>Menetia maini</i>	LC	
Reptile	<i>Moloch horridus</i>	LC	
Reptile	<i>Morethia ruficauda</i>	LC	
Reptile	<i>Oedura marmorata</i>	LC	
Reptile	<i>Pogona vitticeps</i>	LC	
Reptile	<i>Proablepharus kinghorni</i>	LC	
Reptile	<i>Pseudonaja ingrami</i>	LC	
Reptile	<i>Pseudonaja modesta</i>	LC	
Reptile	<i>Pseudonaja nuchalis</i>	LC	
Reptile	<i>Pygopus nigriceps</i>	LC	
Reptile	<i>Pygopus uncertain</i>		
Reptile	<i>Ramphotyphlops diversus</i>	LC	
Reptile	<i>Rhynchoedura ornata</i>	LC	
Reptile	<i>Strophurus ciliaris</i>	LC	
Reptile	<i>Suta punctata</i>	LC	
Reptile	<i>Suta suta</i>	LC	
Reptile	<i>Tiliqua multifasciata</i>	LC	
Reptile	<i>Tympanocryptis lineata</i>	LC	
Reptile	<i>Tympanocryptis tetraporophora</i>	LC	
Reptile	<i>Varanus acanthurus</i>	LC	
Reptile	<i>Varanus gouldii</i>	LC	
Reptile	<i>Varanus spenceri</i>	DD	
Reptile	<i>Varanus tristis</i>	LC	

**7.5 Appendix Five:** Fauna recorded during on site investigations by Low Ecological Services in 2008 and 2009 within the Wonarah prospect (SEL26452)

Status is given under the Commonwealth Environment Protection and Biodiversity Act (1999) (EPBC) (amended 2004), and the Territory Parks and Wildlife Conservation Act (2000) (TPWC). See Appendix 4 for key to conservation code descriptions.

Common Name	Scientific	Conservation Status	
		EPBC	TPWC
<b>Mammals</b>		<b>EPBC</b>	<b>TPWC</b>
Camel	<i>Camelus dromedarius</i>		Int.
Cat, Feral	<i>Felis catus</i>	-	Int.
Cow	<i>Bos taurus</i>	-	Int.
Dingo	<i>Canis lupis</i>	-	LC
Donkey, Feral	<i>Equus asinus</i>	-	Int.
Dunnart, Fat-tailed	<i>Sminthopsis crassicaudata</i>		LC
Dunnart, Lesser hairy-footed	<i>Sminthopsis youngsoni</i>	-	LC
Dunnart (unidentified)		-	-
Echidna, Short-beaked	<i>Tachyglossus aculeatus</i>	-	LC
Euro	<i>Macropus robustus</i>		LC
Fox, Red	<i>Vulpes vulpes</i>	-	Int.
Kangaroo, Red	<i>Macropus rufus</i>	-	LC
Mouse, Sandy inland	<i>Pseudomys hermannsburgensis</i>		LC
Mouse, Desert	<i>Pseudomys desertor</i>		LC
Mouse, Spinifex Hopping	<i>Notomys alexis</i>		LC
Mouse (unidentified)			
Wallaby, Northern Nailtail	<i>Onychogalea unguifera</i>	-	NT
<b>Reptiles</b>		<b>EPBC</b>	<b>TPWC</b>
Blue-tongue, Centralian	<i>Tiliqua multifasciata</i>	-	LC
Dragon	<i>Diporiphora lalliae</i>	-	LC
Dragon, Military	<i>Ctenophorus isolepis</i>	-	LC
Gecko, Fat-tailed	<i>Diplodactylus conspicillatus</i>	-	LC
Gecko, Spiny-tailed	<i>Strophurus ciliaris</i>	-	LC
Gecko, Varigated	<i>Gehyra variegata</i>		
Gecko (unidentified)		-	-
Goanna, Sand	<i>Varanus gouldii</i>	-	LC
Goanna (unidentified)		-	-
Legless lizard (unidentified)		-	-
Lerista, Two-toed	<i>Lerista bipes</i>	-	LC
Monitor, Pygmy Desert	<i>Varanus eremius</i>	-	LC
Monitor, Pygmy Mulga	<i>Varanus gilleni</i>	-	LC
Thorny Devil	<i>Moloch horridus</i>	-	LC
Sand-swimmer, Broad-banded	<i>Eremiascincus richardsonii</i>	-	LC
Skink, Ctenotus	<i>Ctenotus leonhardii</i>	-	LC

Common Name	Scientific	Conservation Status	
Skink, Ctenotus	<i>Ctenotus schomburgkii</i>	-	LC
Small lizard (unidentified)			
Snake (unidentified)		-	-
<b>Birds</b>		<b>EPBC</b>	<b>TPWC</b>
Babbler, Grey-crowned	<i>Pomatostomus temporalis</i>	-	LC
Bellbird, Crested	<i>Oreoica gutturalis</i>	-	LC
Budgerigar	<i>Melopsittacus undulatus</i>	-	LC
Bustard, Australian	<i>Ardeotis australis</i>	-	VU
Button-Quail, Little	<i>Turnix pyrrhonorax</i>	-	LC
Chat, Crimson	<i>Epthianura tricolor</i>	-	LC
Cockatiel	<i>Nymphicus hollandicus</i>	-	LC
Dove, Diamond	<i>Geopelia cuneata</i>	-	LC
Fairy-wren, Variegated	<i>Malurus lamberti</i>	-	LC
Falcon, Brown	<i>Falco berigora</i>	-	LC
Finch, Zebra	<i>Taeniopygia guttata</i>	-	LC
Galah	<i>Cacatua roseicapilla</i>	-	LC
Hobby, Australian	<i>Falco longipennis</i>	-	LC
Honeyeater, Grey headed	<i>Lichenostomus keartlandi</i>	-	LC
Honeyeater, Singing	<i>Lichenostomus virescens</i>	-	LC
Honeyeater, Spiny-cheeked	<i>Acanthagenys rufogularis</i>	-	LC
Jacky Winter	<i>Microeca fascinans</i>	-	LC
Kingfisher, Sacred	<i>Todiramphus sanctus</i>	-	LC
Kite, Black	<i>Milvus migrans</i>	-	LC
Kite, Whistling	<i>Haliastur sphenurus</i>	-	LC
Magpie, Black-backed	<i>Gymnorhina tibicen</i>	-	LC
Miner, Yellow-throated	<i>Manorina flavigula</i>	-	LC
Owl, Barn	<i>Tyto alba</i>	-	LC
Pardalote, Red-browed	<i>Pardalotus rubricatus</i>	-	LC
Parrot, Australian Ringneck	<i>Barnardius zonarius</i>	-	LC
Pratincole, Australian	<i>Stiltia isabella</i>	-	LC
Quail-thrush Cinnamon	<i>Cinlosoma cinnamomeum</i>	-	LC
Songlark, Brown	<i>Cincloramphus cruralis</i>	-	LC
Triller, White-winged	<i>Lalage sueurii</i>	-	LC
Wagtail, Willie	<i>Rhipidura leucophrys</i>	-	LC
Wedgebill, Chiming	<i>Psophodes occidentalis</i>	-	LC
Woodswallow, Blackfaced	<i>Artamus cinereus</i>	-	LC
Woodswallow, Masked	<i>Artamus personatus</i>	-	LC