
DESKTOP ASSESSMENT
OF
FLORA, VEGETATION AND FAUNA VALUES
ON THE
GRAVEYARD BORE PROJECT AREA,
TANAMI , NORTHERN TERRITORY

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Prepared for: Ferdie's Find Pty Ltd

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Mattiske Consulting Pty Ltd

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TABLE OF CONTENTS

	Page
1. SUMMARY	1
2. INTRODUCTION.....	2
3. DESKTOP REVIEW METHODOLOGY	2
4. KEY VALUES	2
4.1 Topography and Landforms	2
4.2 Climate	10
4.3 Landsystems	11
4.4 Flora.....	14
4.4.1 Threatened and Significant Flora	14
4.4.2 Weeds	17
4.5 Threatened and Significant Fauna	19
4.6 Feral Animals.....	20
4.7 Vegetation	22
4.8 World Heritage Areas and Ramsar Wetlands.....	22
4.9 Sites of Conservation Significance.....	22
5. CONCLUSIONS.....	24
6. REFERENCES	24

TABLES

- 1: Summary of Threatened Flora, Significant Flora, Restricted Range Flora and Introduced Species as extracted from NR maps
- 2: Summary of Threatened Flora, Significant Flora, Restricted Range Flora and Introduced Species from Protected Matters Search Tool

FIGURES

- 1: Grave Yard Bore Project – Locality, Tanami, Northern Territory
- 2.0: Grave Yard Bore Project – Overview, Topography
- 2.1: Grave Yard Bore Project – Overview, Aerial Photography 2011
- 2.2: Grave Yard Bore Project – EL30256 (North), Aerial Photography 2011
- 2.3: Grave Yard Bore Project – EL30256 (South), Aerial Photography 2011
- 2.4: Grave Yard Bore Project – Target Study Area, Aerial Photography 2011
- 2.5: Grave Yard Bore Project – Target Area Activities, Aerial Photography 2011
- 3: Rainfall and temperature data for Rabbit Flat
- 4: Grave Yard Bore Project – Environment Landscape Classes – NT Land Systems (1M)
- 5: Grave Yard Bore Project – Environment Tanami Downs Land System (250k)
- 6: Grave Yard Bore Project – Environment, Significant Flora
- 7: Grave Yard Bore Project – Environment, Weeds
- 8: Grave Yard Bore Project – Environment, Significant Fauna
- 9: Grave Yard Bore Project – Environment, National Vegetation Information System
- 10: Grave Yard Bore Project – Environment, Sites of Botanical Significance
- 11: Grave Yard Bore Project – Environment, Aquifer Type

APPENDIX

- A: EPBC Act Protected Matters Search Tool – 30km of EL30256 target area (DotEE 2017b)

1. SUMMARY

The desktop assessment for the Grave Yard Bore lease areas and a target area within the lease areas was prepared after extracting a range of datasets from the Northern Territory and National databases.

The following potential values may occur on the targeted area and the Graveyard Bore lease areas:

1. Landsystems – variable landforms and soils which at the regional level were broadly defined. The landsystems all are well represented beyond the boundary of the targeted study area.
2. Flora – on the basis of the database searches no threatened flora species have been recorded within 30km of the targeted study area; however in view of several landform, soils and site preferences there may be the potential for several threatened species to occur. The latter may relate to the paucity of detailed studies near the Grave Yard Bore targeted study area.
3. Weeds – a range of weeds have been located in the region and there is a need to be proactive in minimising the spread of weeds.
4. Fauna – on the basis of the database searches no threatened fauna species have been recorded within 30km of the targeted study area; however in view of several landforms, soils and site preferences there may be the potential for several threatened species to occur. The latter may relate to the paucity of detailed studies near the Grave Yard Bore targeted study area. Of the species highlighted the listed Greater Bilby appears to be the closest record to the targeted study area.
5. Feral Animals – a range of feral animals have been recorded in the region and there is a need to be proactive in their management to minimize the threats to the native fauna species; in particular the conservation significant species.
6. Vegetation – on the basis of the NVIS vegetation mapping data and a comparison with the more detailed landsystem data for Tanami Downs there appears to be greater variation present than that reflected in the NVIS national mapping.
7. Sites of Botanical Significance – the targeted study area associated with the Grave Yard Bore study area does not occur within a defined site of botanical significance by the Northern Territory government; however the central and northern areas of EL30256 do occur within a site of botanical significance associated with the Tanami Desert.

Purpose of the desktop assessment was to identify ecological values that have the potential to be impacted by the proposed development activities on the Grave Yard Bore lease areas. The lease area (EL30256) consists of three areas, the northern area, the southern area and the target study area (Figure 1). This lease area occurs southwest of the Rabbit Flat Roadhouse and southwest of the Tanami Road.

In view of the nature of the proposed localized and initial exploration activities within the targeted study any impacts should be minimal as the underlying landsystems, landforms, soils and vegetation are well represented outside the targeted study area. The exception to the latter is the soak on the western fringe of the targeted study area that is relatively restricted and as such may support a range of specialised flora and fauna species. Consequently every effort should be made to avoid the soak area on the western fringes of the targeted study area.

In summary, the data indicates that there is some potential for several threatened flora and fauna species to occur within the targeted study area on EL30256 and therefore if the project activities intensify beyond this initial phase then it is recommended that detailed flora and fauna studies are undertaken on the targeted study area.

2. INTRODUCTION

Mattiske Consulting Pty Ltd was commissioned by **Ferdie's Find Pty Ltd** to prepare a desktop assessment of the potential ecological values on EL30256 (Grave Yard Bore lease areas) and in particular the target study area (Figure 1). The lease area (EL30256) consists of three areas, the northern area, the southern area and the target study area (Figure 1). This lease area occurs southwest of the Rabbit Flat Roadhouse and southwest of the Tanami Road.

2.1 Relevant Northern Territory and National Legislation and Guidelines

In undertaking this review the authors were aware of the main legislation and guidelines for the Northern Territory and the Commonwealth of Australia, namely:

- . *The Mining Management Act*
- . *Environmental Assessment Act*
- . *Territory Parks and Wildlife Conservation Act 2006*
- . *Weeds Management Act 2001*
- . *The Northern Territory Land Clearing Guidelines 2010 (Department of Natural Resource, Environment, the Arts and Sport (2010)*
- . *The Northern Territory Guidelines for Assessment of Impacts on Terrestrial Biodiversity (NT, EPA 2013)*
- . *The Northern Territory Offset Guidelines on Environmental Offsets and Associated Approval Conditions*
- . *The Environment Protection and Biodiversity Conservation Act 1999 (DotEE 2017a, 2017b)*

3. DESKTOP REVIEW METHODOLOGY

To assess and detail potential botanical values present within the proposed targeted study area within the Grave Yard Bore project area, suitable databases were accessed and reviewed. These included:

1. The *Commonwealth EPBC Act 1999* protected matters search tool (PNST) database
2. (<http://www.environment.gov.au/epbc/pmst/index.html>),
3. NT Natural Resource Management InfoNet database (NR Map),
4. Atlas of Living Australia (www.ala.org.au) online portal,
5. Northern Territory Department of Land Resource Management Natural Resource Mapping portal, and
6. Relevant ecological studies undertaken in the vicinity of the proposed development (e.g. White *et al.* 2000; EcOz Environmental Services 2012).

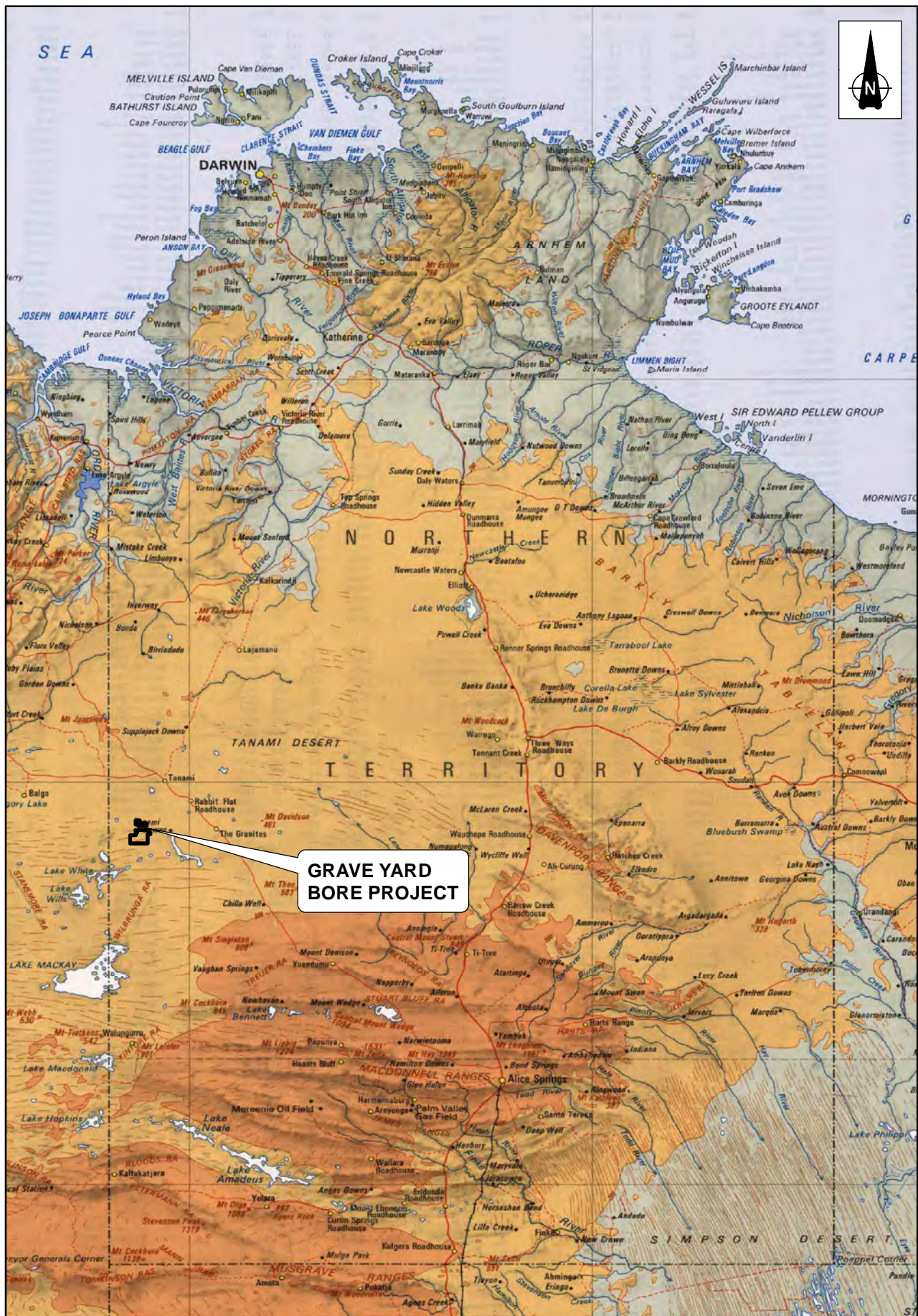
Appropriately, analysis of database searches used an indicative 20 km buffer from the proposed Grave Yard Bore project area; with a 30 km buffer used for additional contextual information.

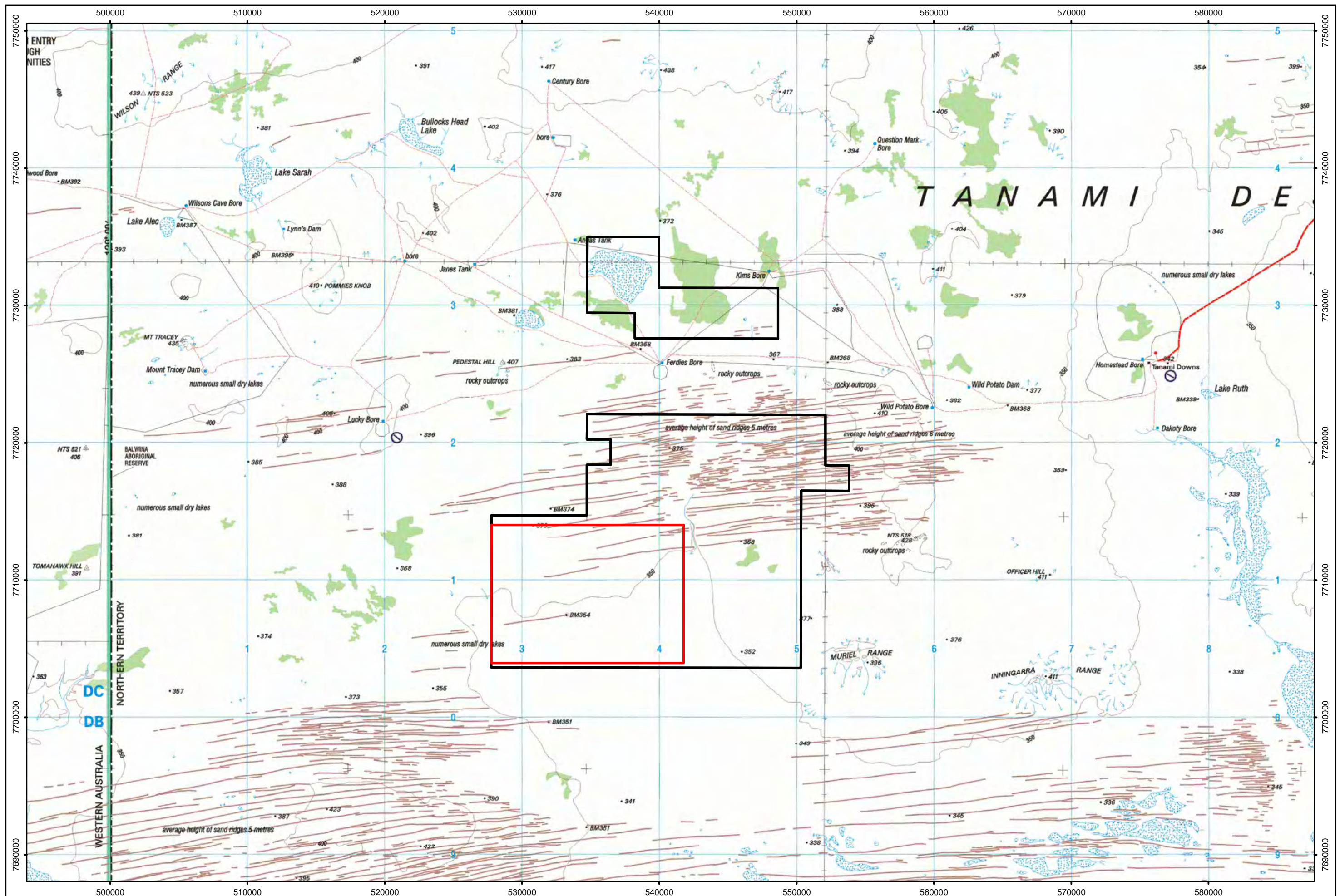
4. KEY VALUES

4.1 Topography and Landforms

The target study area as indicated by a review of the various topography (Figure 2) and the series of aerials (Figure 2.1 to 2.4) is dominated by the sand ridges with east-west dunes in the northern section of the target area and the spinifex dominated sandplains in the central and southern sections of the target area. The east-west dunes are more dominant in the northern half of the southern section of EL30256. In addition, there are stands of Mulga on the target study area and a small low lying soak or seasonally wetter area in the south-western corner of the target study area. The proposed initial exploration activities are relatively localized and restricted on the targeted study area of EL30256 to the more dominant land systems (Figure 2.5).

A soak occurs on the western side of the targeted study area on EL30256, and therefore as this is a restricted landsystem in terms of its representation within the local area, this area should be avoided during this initial phase of exploration activities.





Legend
 ■ Target Study Area
 ■ EL30256

Notes:
 Topography: Geoscience Australia (250k)

Client:
Ferdie's Find Pty Ltd



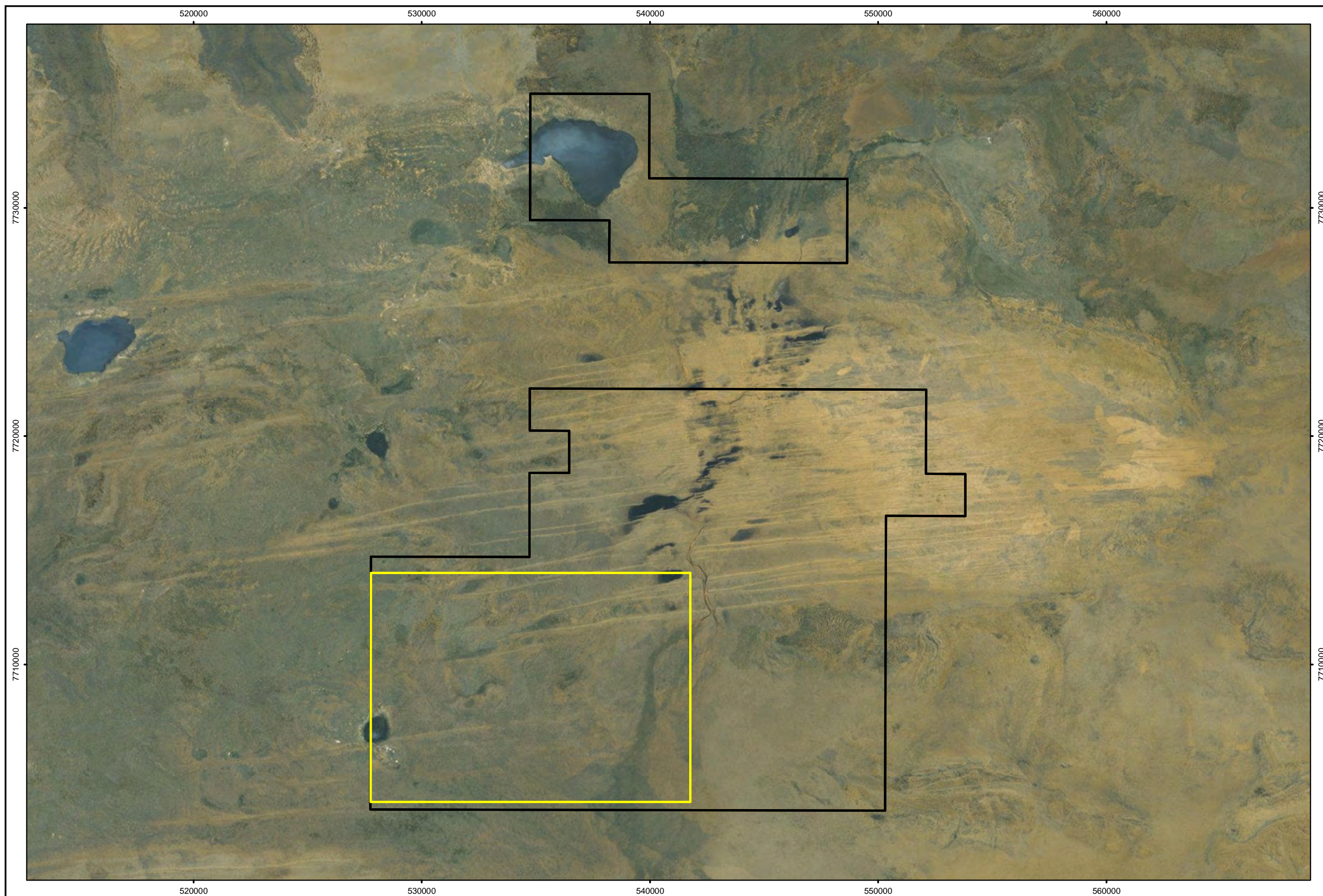
0 2.5 5km
 Scale: 1:250,000
 GDA 1994 MGA Zone 52
 CADRef: a2520_F002_00
 Date: Apr 2017 Rev: A A3

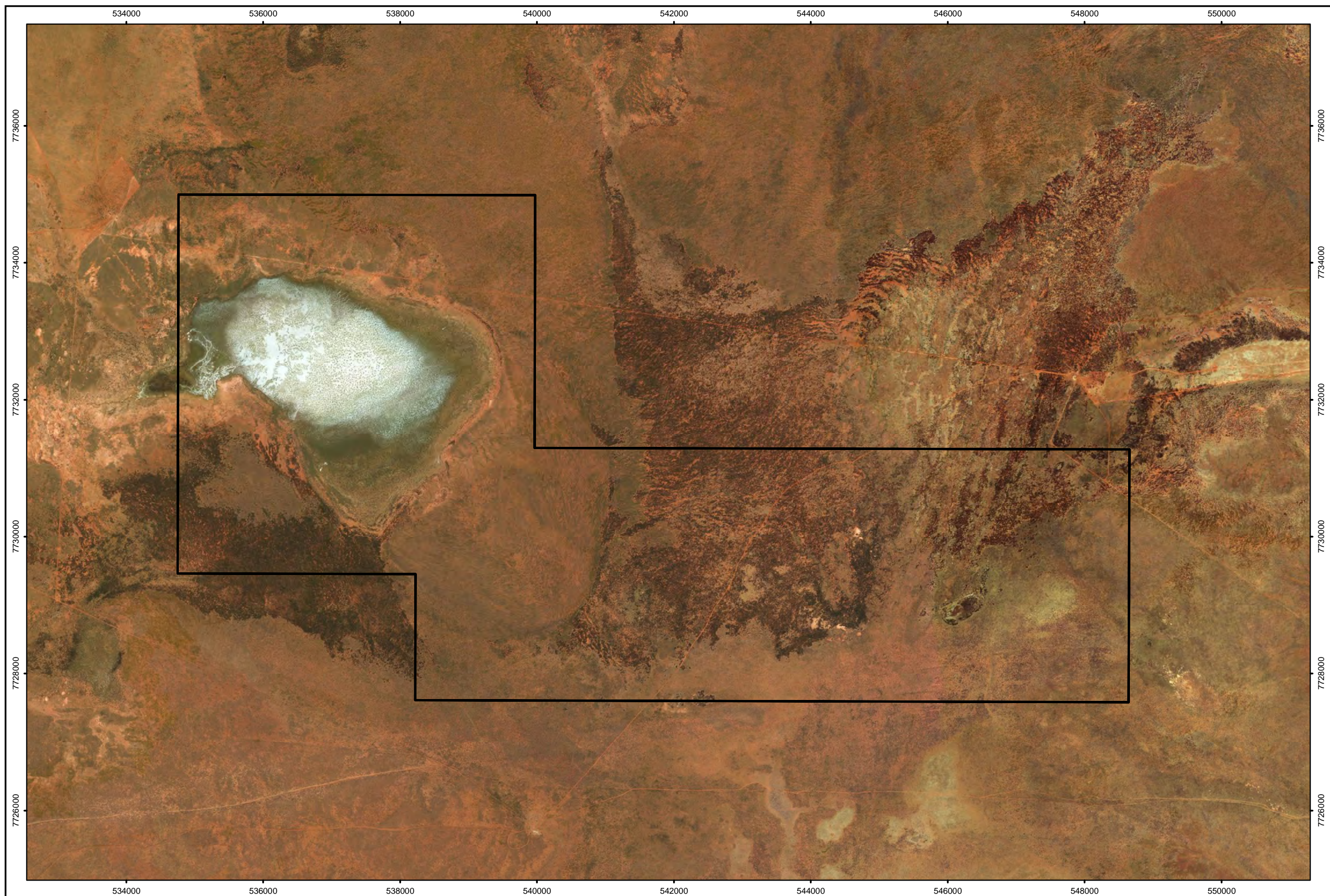
Mattiske Consulting Pty Ltd
 28 Central Road, Kalamunda WA 6076 - Tel: 9257 1625 - Fax: 9257 1640
 Author: E M Mattiske MCPL Ref:
 Drawn: CAD Resources - www.cadresources.com.au
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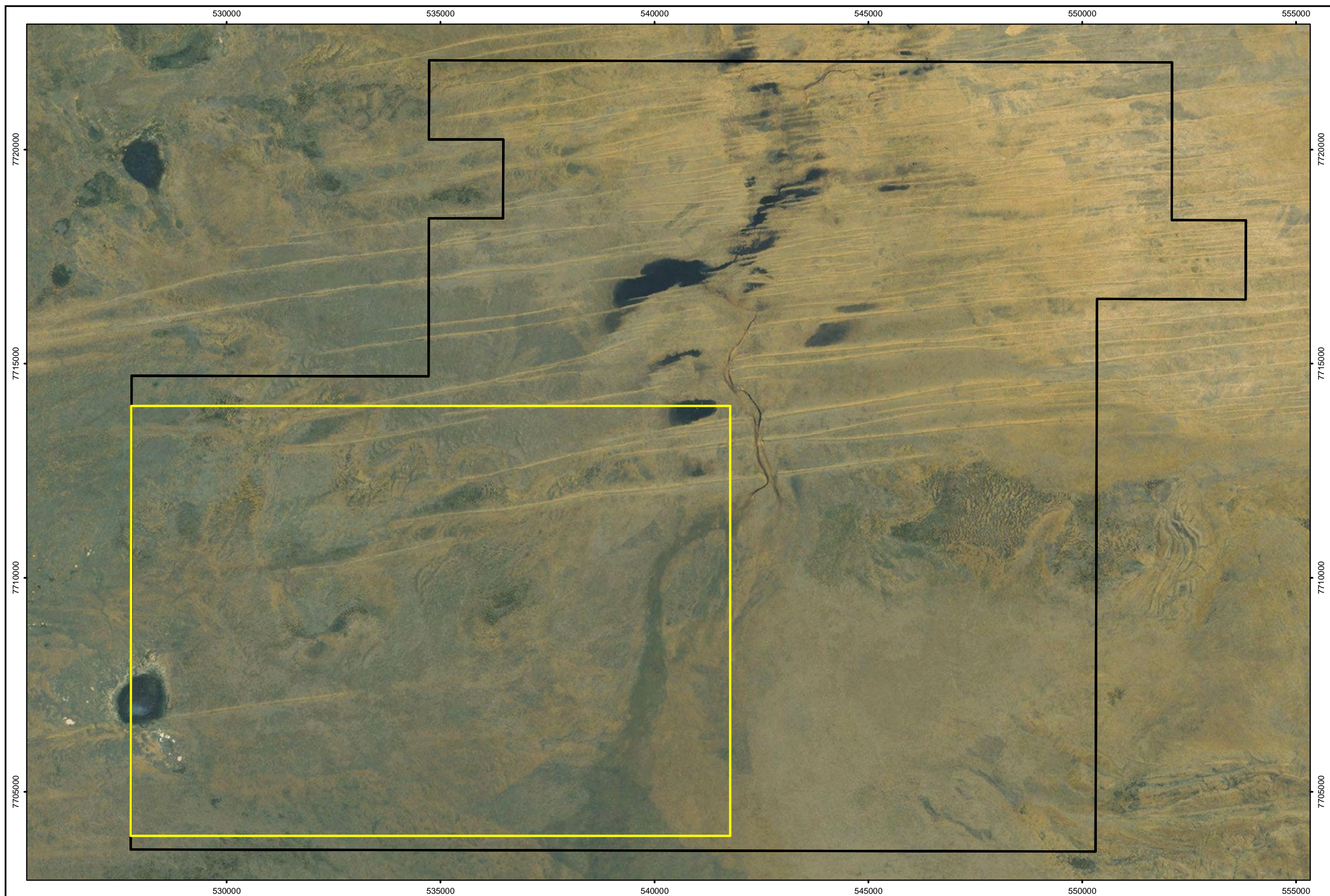
**Grave Yard Bore Project
 Overview
 Topography**

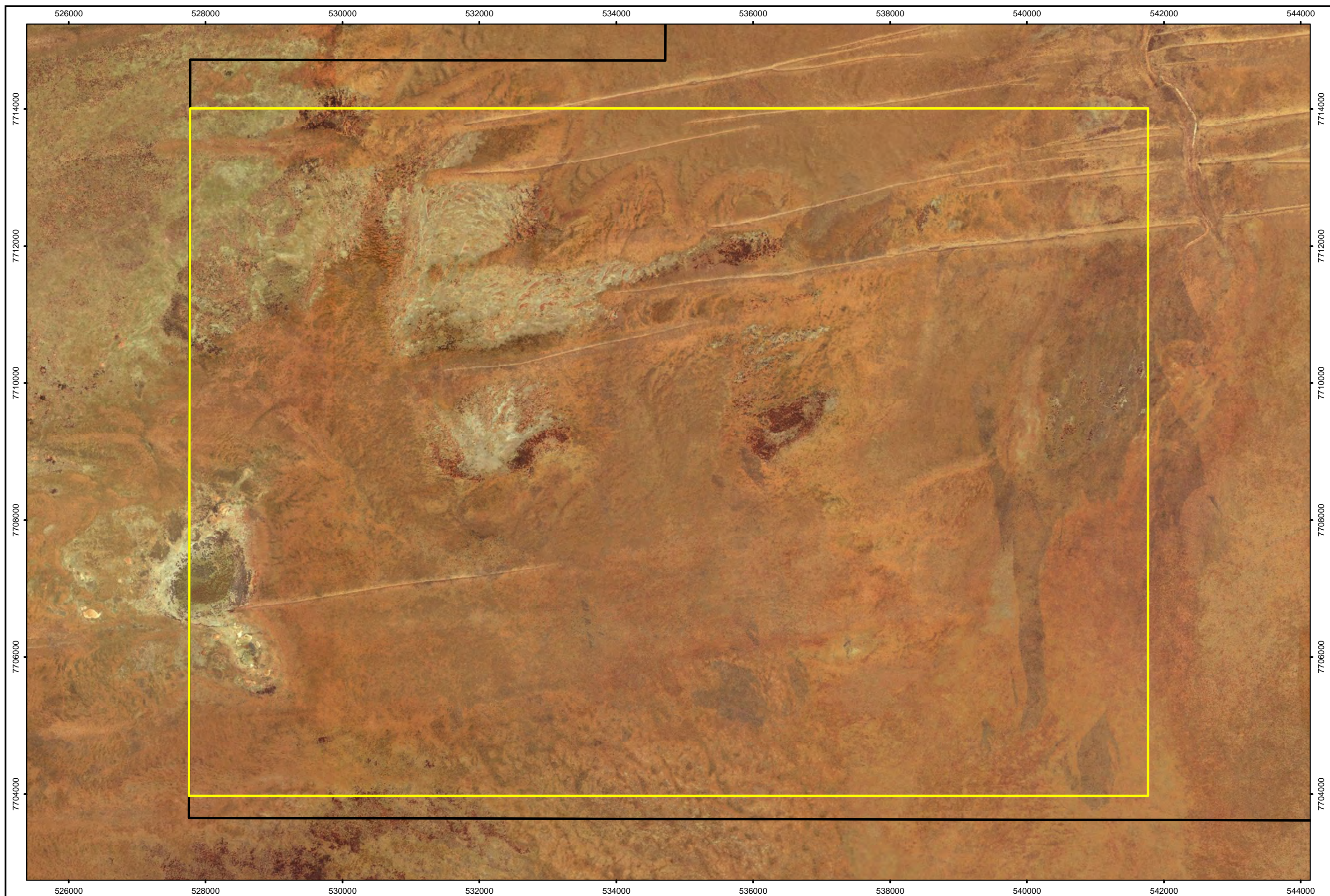
Figure:

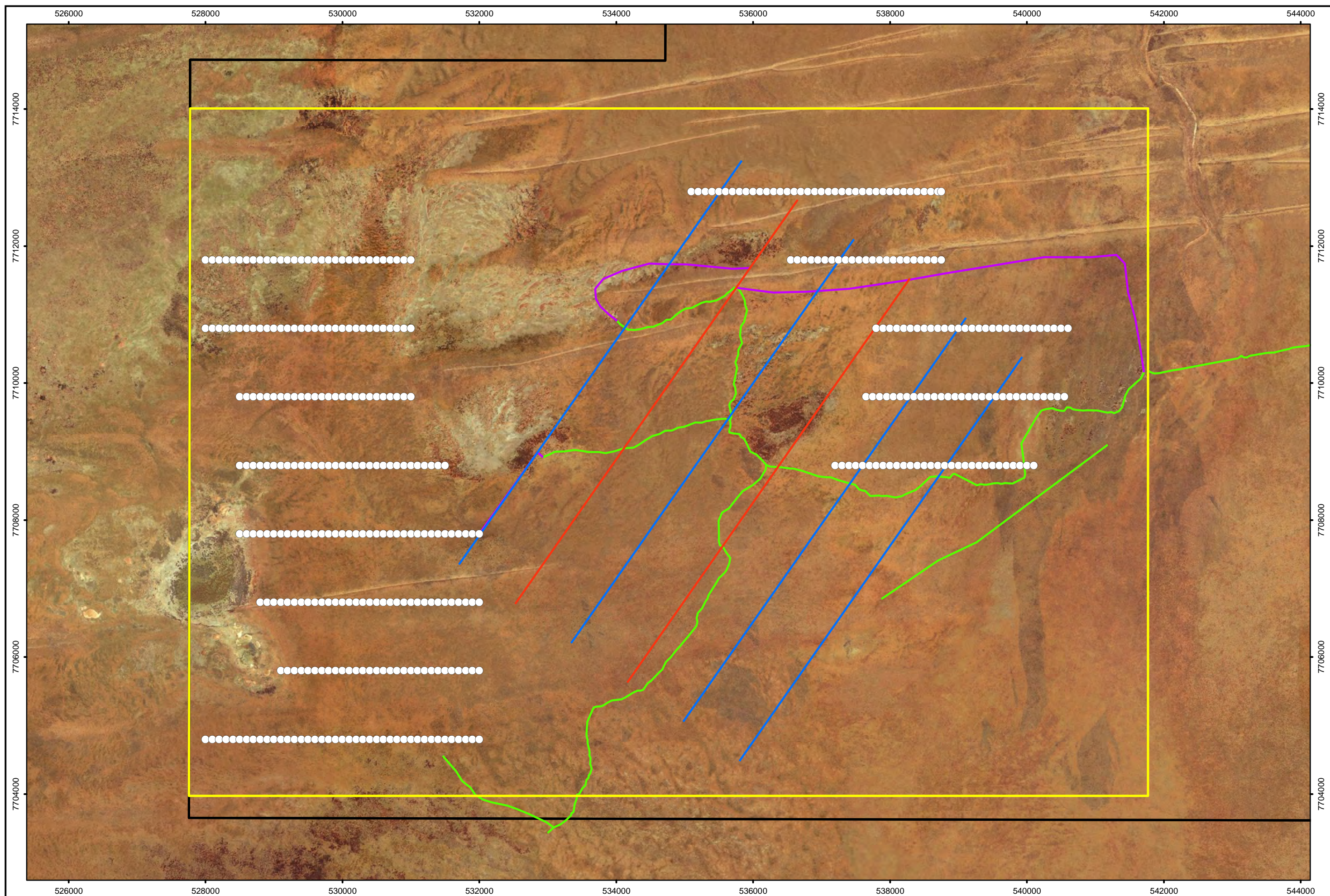
2











4.2 Climate

The climate at Rabbit Flat (located north of the target study area) is associated with wetter summer months and drier winter months and higher maximum and minimum temperatures in the summer months as compared to the winter months. The mean annual rainfall is 483.7 mm of precipitation (Bureau of Meteorology 2017). The effectiveness of the rainfall events is influenced by higher temperatures and evaporation rates.

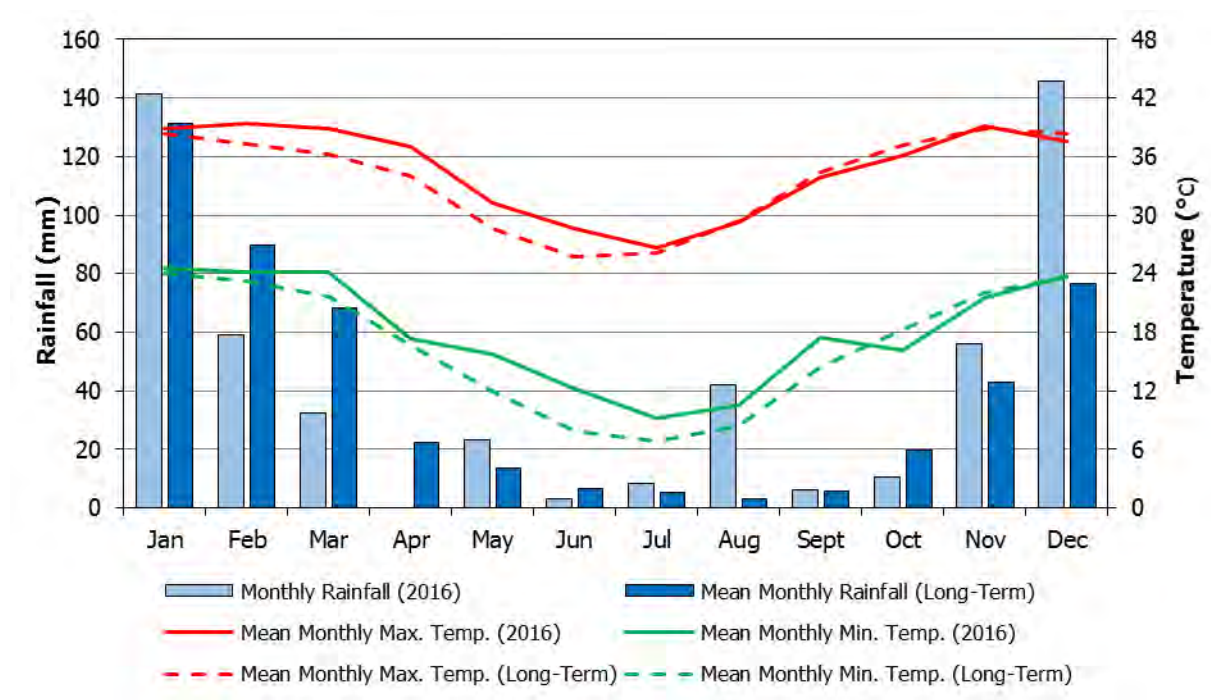


Figure 3: Rainfall and temperature data for Rabbit Flat
Long term average (LTA) rainfall and temperature data, together with monthly rainfall data for the period 1997 to 2016 are shown (BOM 2017).

4.3 Landsystems

Three landsystem classes as defined by Northern Territory government (from Northern Territory Government Atlas) at a regional scale were recorded in the target study area of EL30256 and in the wider EL30256 (Figure 4). These landsystems were:

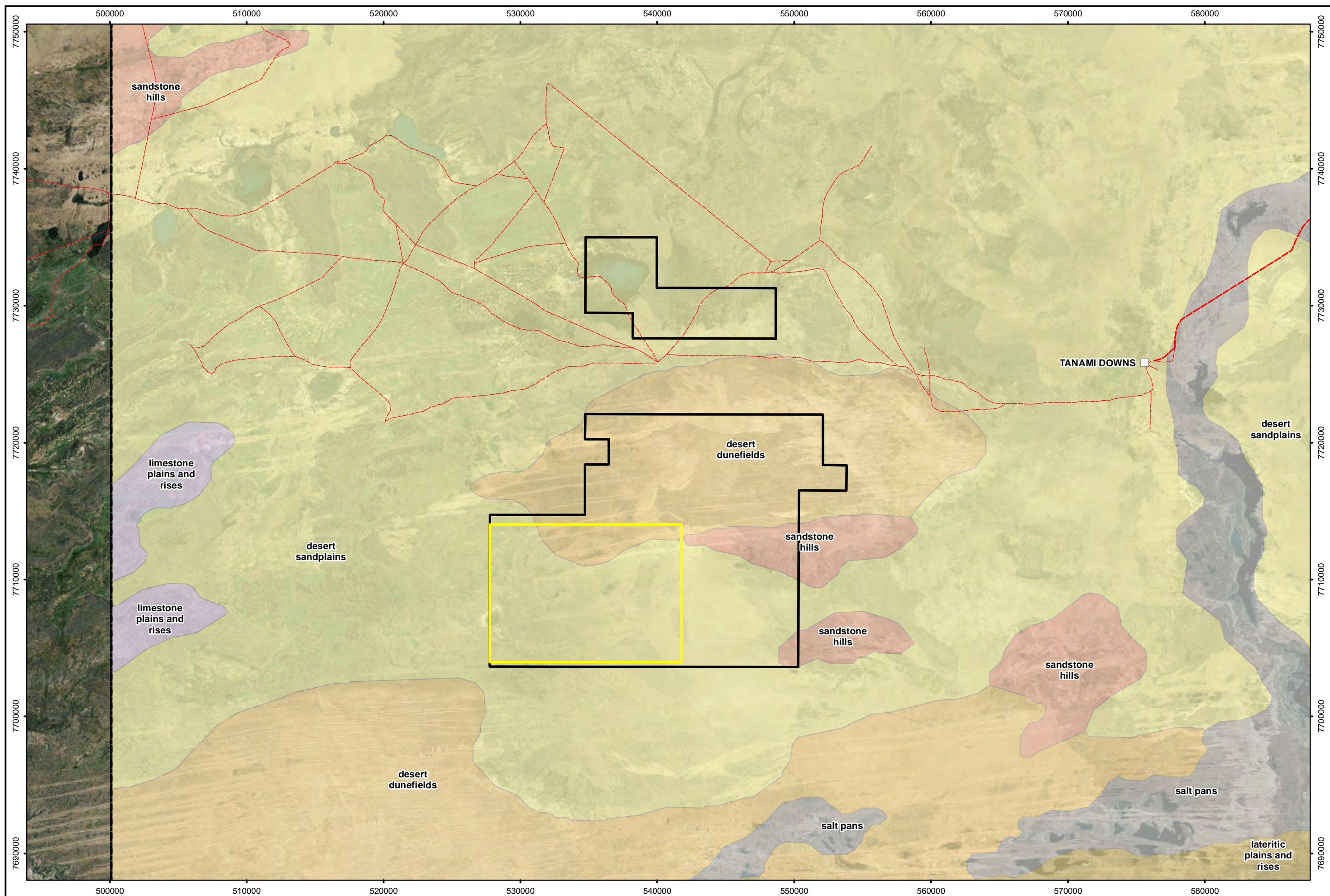
- Coolindie and Singleton - Desert Sandplains – Level to undulating sandplains with red sands
- Atlas_AB53 - Desert Dunefields – Dunefields with parallel linear dunes, reticulate dunes and irregular or aligned short dunes; red sands
- Atlas_BA5 - Sandstone Hills - low hills, hills and stony plateaux on sandstone, siltstone, quartzite and conglomerate (deeply weathered in places); outcrop with shallow stony soils

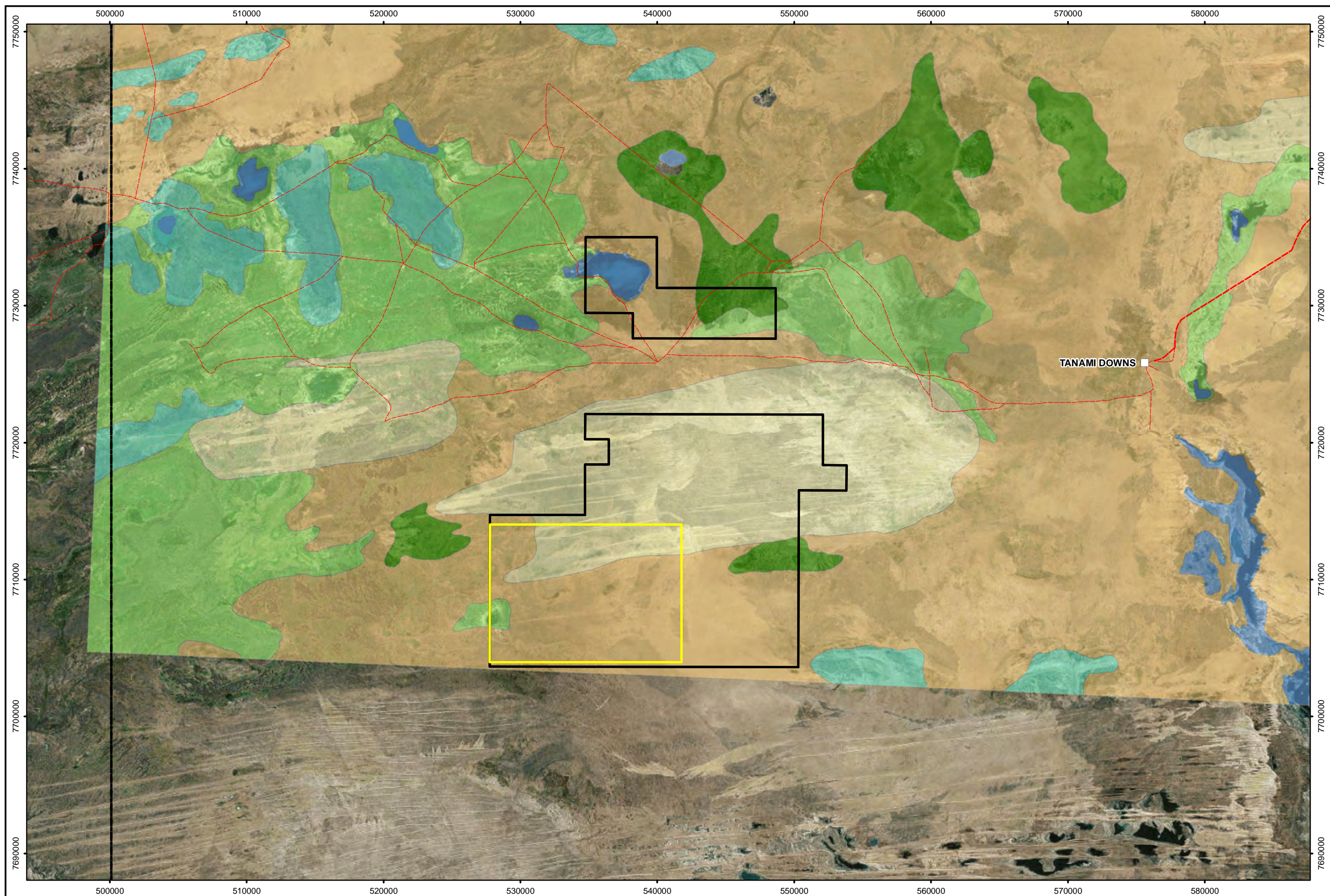
All of these landsystems within the target study area extend well beyond the boundary of the target area.



At a more local scale associated with Tanami Downs the dominate landsystems supports a range of dominant landforms, soils and vegetation types, namely (Figure 5):

- Sand Ridges (in the target area and EL30256)
- Spinifex Sandplain (in the target area and EL30256)
- Grassland (in the target area and EL30256)
- Mulga (not in the target area, but in EL30256)
- Salt Lakes or Fresh Water Swamps (not in the target area at the mapping scale, but in EL30256)
- Hills (not in EL30256)

The majority of these landsystems (with the exception of the soak on the western side of the study area) that occur within the target study area extend well beyond the boundary of the target area (Figure 5).





<p>Legend</p> <ul style="list-style-type: none">Target Study AreaEL30256GrasslandHillsMulgaSalt Lakes or Fresh Water SwampsSand RidgesSpinifex Sandplain <p>Notes: Imagery: SPOT 5 (CNES/Airbus DS) Data: NT Government Atlas</p>	<p>Client:</p> <p>Ferdie's Find Pty Ltd</p>	<p>Scale: 1:250,000 GDA 1994 MGA Zone 52 CADRef: a2520_F003_07 Date: Apr 2017 Rev: A A3</p> <p></p>	<p> Mattiske Consulting Pty Ltd 28 Central Road, Kalamunda WA 6076 ~ Tel: 9257 1625 ~ Fax: 9257 1640 Author: E M Mattiske MCPL Ref: Drawn: CAD Resources ~ www.cadresources.com.au Tel: (08) 9246 3242 ~ Fax (08) 9246 3202</p>	<p>Grave Yard Bore Project Environment Tanami Downs Land System (250k)</p>	<p>Figure:</p> <p>5</p>
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4.4 Flora

The various databases at the Territory and National level and information from regional studies (White *et al.* 2000; DotEE 2017b) indicated a range of species that may occur within the Grave Yard Bore project area. The likelihood of all of these species within the different landform and soils will depend also on seasonal conditions. Several limitations were found in the flora databases, as the data is dependent on previous efforts by various researches and therefore the data as extracted is considered potential flora.

4.4.1 Threatened and Significant Flora

One threatened flora species *Eleocharis papillosa* (*Environment Protection and Biodiversity Conservation Act 1999* - VU) has been recorded within 40km of the target study area. As this species occurs on lower lying areas this species may occur in the soak on the western edge of the targeted study area. Given the likelihood of occurrence scenarios for *Eleocharis papillosa* (VU), the desktop assessment correctly recommended that the soak is avoided in the initial phase of exploration and that if the project activities increase in later phases that field validation be undertaken in view of the potential impact to individuals and/or populations as a result of the proposal.

No threatened flora species were highlighted within the bounds of the desktop assessment buffer 20km and 30km radius from targeted study area, although a range of significant flora were recorded, Tables 1 and 2. In addition, 4 near Threatened and 5 significant flora species have the potential to occur as they have been recorded in the wider region, namely – near Threatened - *Trianthema oxycalyptra*, *Trachymene inflata*, *Heliotropium sphaericum* and *Trianthema glossostigma*; as well as potentially significant flora - *Heliotropium parviflorum*, *Acacia maconochieana*, *Corynotheca asperata*, *Bonamia alatisemina* and *Tribulus* sp. Long-styled elchlerianua (Figure 6).

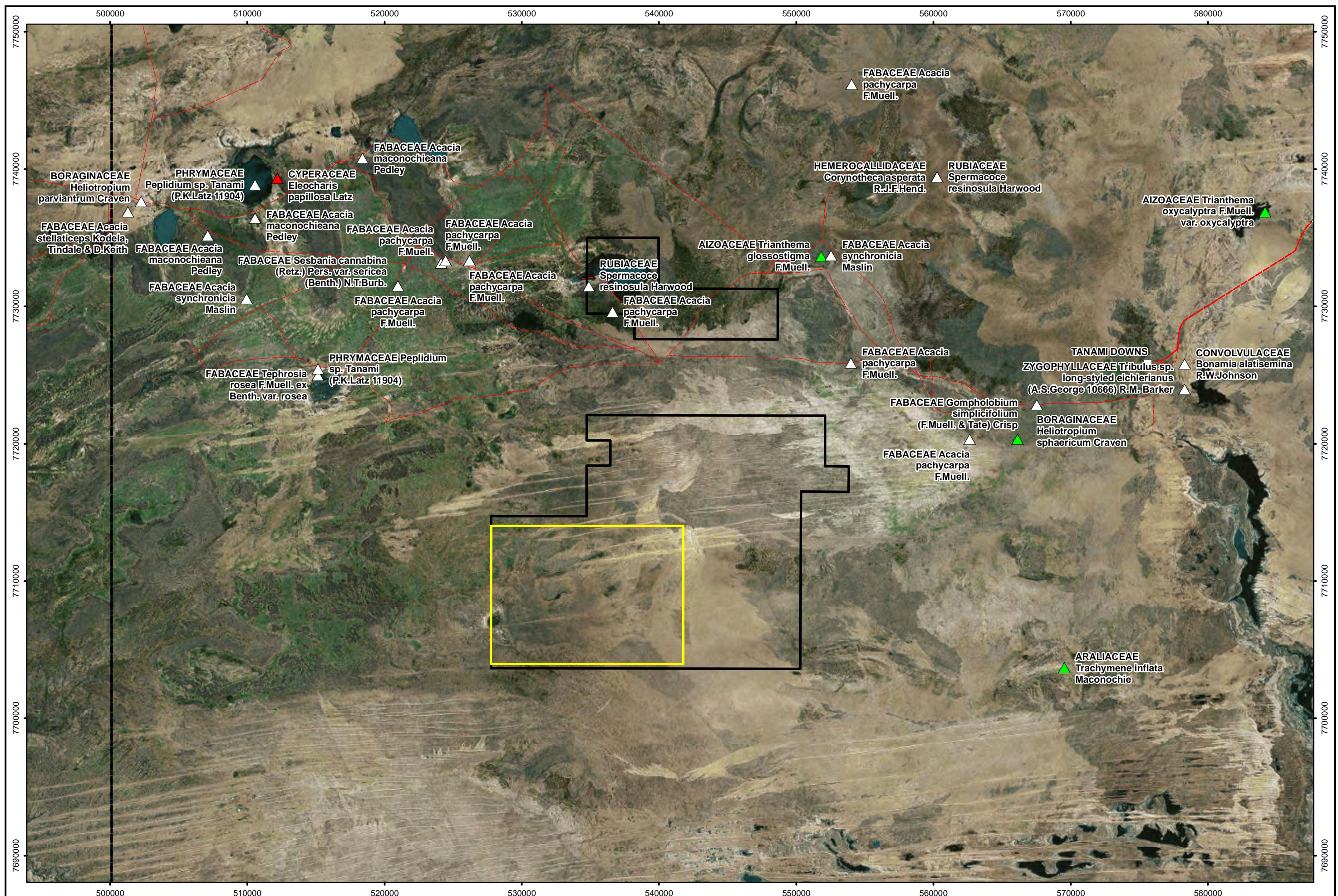
On the basis of the database searches no threatened flora species have been recorded within 30km of the targeted study area; however in view of several landform, soils and site preferences there may be the potential for several threatened species to occur. The latter may relate to the paucity of detailed studies near the Grave Yard Bore targeted study area.

Although significant flora are not afforded the same legislative protection as threatened flora, the presence of such taxa can, in some cases, pose constraints to development. Hence, quantification of individuals and/or populations within the proposed Grave Yard Bore targeted study area could provide important local and regional information to contextualise and mitigate potential impacts if the project develops beyond this initial exploration phase.

If initial exploration activities are restricted to the dominant landsystems and vegetation types that extend well beyond the targeted study area on EL30256 then any impacts on threatened or significant species should be negligible at this phase of the exploration activities.

		Taxon Name	Threatened 2012	Significant 2012	Introduced Status
NR maps (20km)	Threatened flora	No Threatened flora species are likely to be found within 20 km radius	N/A	N/A	N/A
	Significant flora	FABACEAE <i>Acacia pachycarpa</i> F. Muell.	N/A	1	NATIVE TO NT
		RUBIACEAE <i>Spermacoce resinosula</i> Harwood	N/A	1	NATIVE TO NT
	Restricted Range	No Restricted Range flora species are likely to be found within 20 km radius	N/A	N/A	N/A
	Introduced species	POACEAE <i>Cenchrus ciliaris</i> L.	N/A	N/A	INTRODUCED TO NT
NR maps (30km)	Threatened flora	No Threatened flora species are likely to be found within 30 km radius	N/A	N/A	N/A
		AIZOACEAE <i>Trianthema glosostigma</i> F. Muell.	N/A	1	NATIVE TO NT
		BORAGINACEAE <i>Heliotropium sphaericum</i> Craven	N/A	1	NATIVE TO NT
		FABACEAE <i>Sesbania cannabina</i> (Retz.) Pers. var. <i>sericea</i> (Benth.) N. T. Burb.	N/A	1	NATIVE TO NT
		FABACEAE <i>Gompholobium simplicifolium</i> (F. Muell. & Tate) Crisp	N/A	1	NATIVE TO NT
		MALVACEAE <i>Lawrenzia viridigrisea</i> Lander	N/A	1	NATIVE TO NT
		FABACEAE <i>Acacia pachycarpa</i> F. Muell.	N/A	1	NATIVE TO NT
		POACEAE <i>Ectrosia lasioclada</i> (Merr.) S. T. Blake	N/A	1	NATIVE TO NT
		PHRYMACEAE <i>Peplidium</i> sp. Tanami (P. K. Latz 11904)	N/A	1	NATIVE TO NT
		LAMIACEAE <i>Dasymalla chorisepala</i> (Munir) B. J. Conn. & M. J. Henwood	N/A	1	NATIVE TO NT
		FABACEAE <i>Tephrosia rosea</i> F. Muell. ex Benth. var. <i>rosea</i>	N/A	1	NATIVE TO NT
		RUBIACEAE <i>Spermacoce resinosula</i> Harwood	N/A	1	NATIVE TO NT
		FABACEAE <i>Acacia synchronica</i> Maslin	N/A	1	NATIVE TO NT
		ARALIACEAE <i>Trachymene inflata</i> Maconochie	N/A	1	NATIVE TO NT
	Restricted Range	No Restricted Range flora species are likely to be found within 30 km radius	N/A	N/A	N/A
	Introduced species	AIZOACEAE <i>Trianthema portulacastrum</i> L.	N/A	N/A	INTRODUCED TO NT
		FABACEAE <i>Senna obtusifolia</i> (L.) H. S. Irwin & Barneby	N/A	N/A	INTRODUCED TO NT
		CUCURBITACEAE <i>Citrullus colocynthis</i> (L.) Schrad.	N/A	N/A	INTRODUCED TO NT
		CYPERACEAE <i>Cyperus hamulosus</i> M. Bleb.	N/A	N/A	STATUS UNCERTAIN IN NT
		MALVACEAE <i>Malvastrum americanum</i> (L.) Torr.	N/A	N/A	INTRODUCED TO NT
		POACEAE <i>Cenchrus ciliaris</i> L.	N/A	N/A	INTRODUCED TO NT
		POACEAE <i>Echinochloa colona</i> (L.) Link	N/A	N/A	STATUS UNCERTAIN IN NT
		SOLANACEAE <i>Solanum chippendalei</i> Symon	N/A	N/A	WITH INTRODUCED POPULATIONS
		ASTERACEAE <i>Flaveria trinervia</i> (Spreng.) C. Mohr	N/A	N/A	STATUS UNCERTAIN IN NT

Table 1: Summary of Threatened Flora, Significant Flora, Restricted Range Flora and Introduced Species as extracted from NR maps (note – NR Maps data from Northern Territory online Portal)



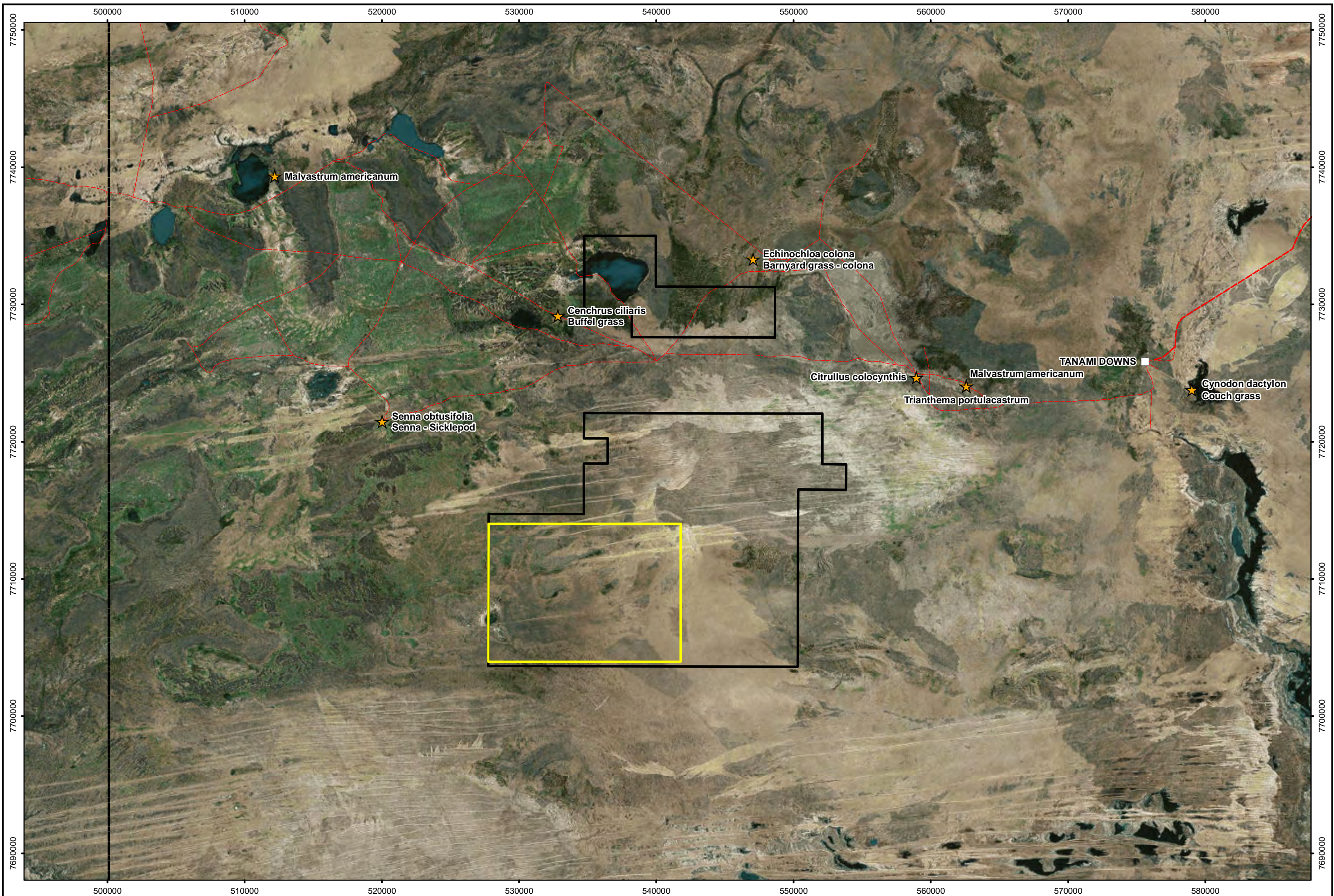
		Taxon Name	Threatened 2012	Significant 2012	Introduced Status
PMST (20km)	Threatened flora	No Threatened flora species are likely to be found within 20 km radius	N/A	N/A	N/A
	Significant flora	No Significant flora species are likely to be found within 20 km radius	N/A	N/A	N/A
	Restricted Range	No Restricted Range flora species are likely to be found within 20 km radius	N/A	N/A	N/A
	Introduced species	Buffel grass	N/A	N/A	INTRODUCED TO NT
PMST (30km)	Threatened flora	No Threatened flora species are likely to be found within 30 km radius	N/A	N/A	N/A
	Significant flora	No Significant flora species are likely to be found within 30 km radius	N/A	N/A	N/A
	Restricted Range	No Restricted Range flora species are likely to be found within 30 km radius	N/A	N/A	N/A
	Introduced species	Buffel grass	N/A	N/A	INTRODUCED TO NT

Table 2: Summary of Threatened Flora, Significant Flora, Restricted Range Flora and Introduced Species from Protected Matters Search Tool (note – from PMST - DotEE 2017b)

4.4.2 Weeds

A range of introduced species have been highlighted in Tables 1 and 2 and Figure 7. Many of these have the potential to impact on the biodiversity values of the targeted study area and the vegetation on EL30256 (NR Map (NT government database and DotEE 2017b).

A range of weed species have the potential to occur or spread to the targeted study area. To appropriately fulfil management and control obligations it would be necessary to maintain vehicle hygiene during any exploration activities. The location and extent of weed populations within the targeted study area of EL30256 would form the foundation of weed management plans and protocols throughout the work phases on site.



4.5 Threatened and Significant Fauna

A database search of the Protected Matters (DotEE 2017b) highlighted:

- . 4 bird species, one critically endangered (Curlew Sandpiper – *Calidris ferruginea*), two endangered (Night Parrot – *Pezoporus occidentalis* and Australian Painted Snipe – *Rostratula alexandreae*) and one vulnerable (Princess Parrot or **Alexandra's Parrot** – *Polytelis alexandreae*), Appendix A. All of these species have the potential to occur in the targeted study area and EL 30256. The Night Parrot appears to prefer long unburnt hummock (Spinifex grasslands) and although recorded recently in Australia is difficult to survey and assess.
- . 2 mammal species, one endangered (Central Rock-rat or Antina – *Zyzomys pedunculatus*) and one vulnerable (Greater Bilby – *Macrotis lagotis*), Appendix A. The Greater Bilby has been recorded just east of the targeted study area and to the north and northeast of the study area and is therefore highly likely in view of its preferred habitats to occur in the targeted study area (Figure 8). There is also the potential for the Brush-tailed Mulgara (*Dasyercus blythi*) (Vulnerable in Northern Territory but not listed under *EPBC Act 1999*) and Crest-tailed Mulgara (*Dasyercus cristicauda*) listed as Vulnerable at the National levels may occur in the study area (Pavey *et al.* 2006; DotEE 2017b). Their absence from Appendix A may reflect the lack of data in the area near EL30256.
- . 1 reptile species, one vulnerable Great Desert Skink or Tjakura, or Warrarna or Mulyamiji (*Liopholis kintorei*), Appendix A. This species has an extensive burrows within a well-defined territory and also appears to prefer a complex habitat with old and regenerating vegetation (McAlpin 2001), see Figure 8.
- . 2 Migratory terrestrial species namely – the Barn Swallow (*Hirundo rustica*), the Grey Wagtail (*Motacilla cinerea*) and the Yellow Wagtail (*Motacilla flava*) may occur in the area (Appendix A). These birds are protected under the CAMBA and JAMBA international agreements.
- . 3 Migratory wetland species, the Curlew Sandpiper (*Calidris ferruginea* (CE see above), the Oriental Plover or Oriental Dotterel (*Charadrius veredus*) and the Oriental Pratincole (*Gareola maldivarum*). These birds are protected under the CAMBA and JAMBA international agreements. These species have the potential to occur in the study area during more favourable conditions, which include during normal migratory movements and during favourable conditions, where standing water is available (i.e. ponds and wetlands)

Several additional significant conservation fauna species are summarized in Figure 8 which were not highlighted in the DotEE (2017b) protected matters search tool, namely the Australian Bustard, Bush Stone-Curlew, the Northern Nailtail Wallaby, the Spectacled Hare-Wallaby, the Woma Python, the King Brown Snake, the Common Greenshank, Emu and Long-tailed Rat. Of these the Greater Bilby is highly likely to occur in the targeted study area.

On the basis of the review of locations summarized in Figure 8, one of the limitations of the previous studies appears to relate to the accessibility of the survey areas with many of the previously recorded species located near tracks and roads in the wider area.

Of these fauna species the most likely threatened species that will require targeted searching is the Greater Bilby (*Macrotis lagotis*) as this species has been recorded just east of the targeted study area. In addition, in view of the range of landform and soil types within the targeted area it is suggested that more targeted searches are made for the range of these significant species that may occur on the project study area should be undertaken if the initial phase of exploration leads to more on-ground activities. Whilst the proposed activities may be relatively confined a better understanding of the site values in relation to the habitats that may support these species should be undertaken. The quantification of individuals and/or populations within the proposed

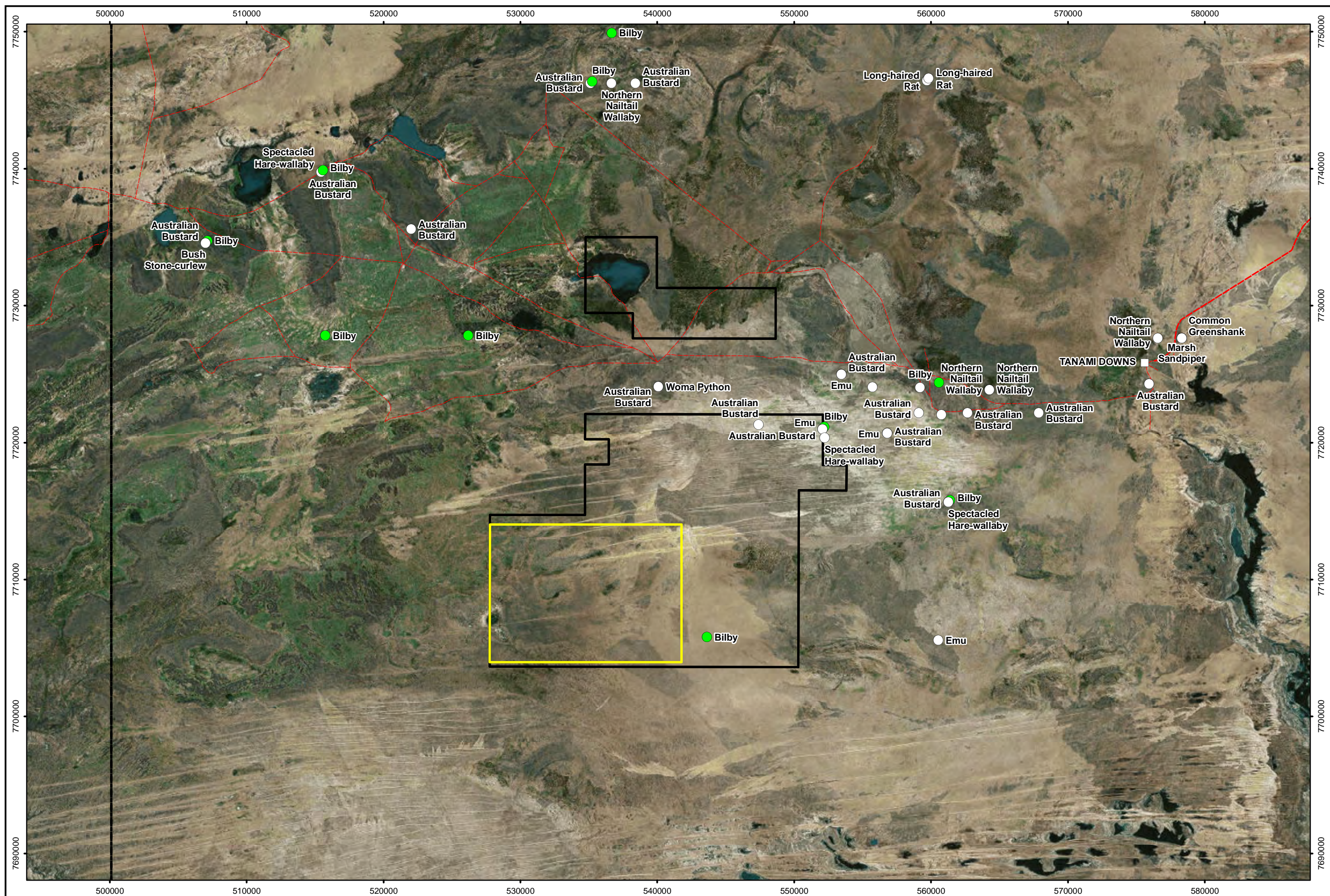
activity areas on the Grave Yard Bore targeted study area could provide important local and regional information to contextualise and mitigate potential impacts of the project activities.

If initial exploration activities are restricted to the dominant landsystems and vegetation types that extend well beyond the targeted study area on EL30256 then any impacts on threatened or significant species should be negligible at this phase of the exploration activities.

4.6 Feral Animals

A range of feral animals have been recorded in the region and there is a need to be proactive in their management to minimize the threats to the native fauna species; in particular the conservation significant species, Appendix A.

The feral animals include the Camel (*Camelus dromedaries*), the domestic dog (*Canis lupus familiaris*), the domestic cat (*Felis catus*), the House Mouse (*Mus musculus*) and the Red Fox (*Vulpes vulpes*). These animals may compete for food and resources and some threaten the native animals through predation. Numbers of feral animals are known to fluctuate markedly under different seasonal conditions and the government has committed significant resources to management of these feral animals. Therefore any effort that can be made during proposed activities to minimise the impact of these introduced animals on native fauna should be optimised.



4.7 Vegetation

Four main vegetation types have been mapped according to the National Vegetation Information System (Figure 9), see NR Map atlas database. Three of these four occur within the targeted study area, namely:

- 410 – Open Tussock Grassland (V1_NVISL2), *Eragrotis* (mixed) low open tussock grassland (V1_NVISL3), *Acacia* low open woodland\ *Eragrotis* low open tussock grassland (V1_NVISL4)
- 576 – Hummock Grassland (V1_NVISL2), *Triodia* hummock grassland (V1_NVISL3), *Triodia* hummock grassland (V1_NVISL4)
- 1032 – Open Hummock Grassland (V1_NVISL2), *Triodia* low open hummock grassland (V1_NVISL3), *Eucalyptus* low isolated trees\ *Acacia* tall sparse shrubland\ *Triodia* low open hummock grassland (V1_NVISL4)

The fourth vegetation type occurs in the northern section of EL30256, namely:

- 416 - Open Shrubland (V1_NVISL2), *Salsola* low open chenopod shrubland (V1_NVISL3), *Melaleuca* low open woodland\ *Salsola* low open chenopod shrubland (V1_NVISL4)

No *EPBC Act* protected Threatened Ecological Communities were identified as occurring or having the potential to occur within the targeted study area within EL30256 of the Grave Yard Bore project area.

These communities were not considered to be threatened or locally restricted. Consequently, the desktop assessment would indicate that at this scale of regional and national mapping any proposed activities would have a minimal impact. As indicated in the review of previous topography and landsystem areas it is likely that some localized areas (such as the soak on the western fringes of the study area) may support a range of different species. To confirm the latter detailed targeted studies on the vegetation would have to be undertaken after this initial exploration phase to ensure that these restricted topographical features and landforms are not supporting restricted or conservation significant species.

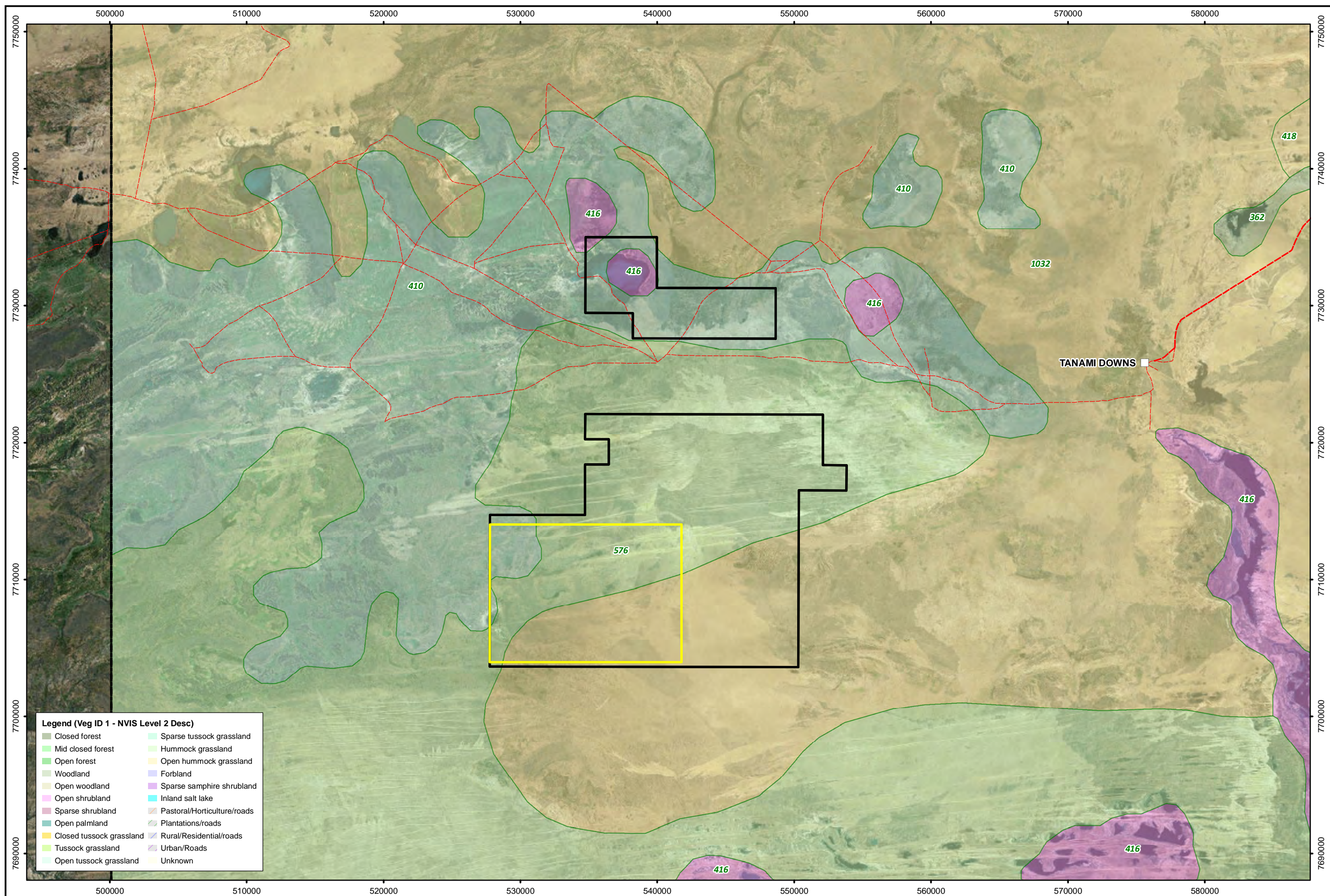
4.8 World Heritage Areas and Ramsar Wetlands

No World Heritage Areas or RAMSAR wetlands were identified as having the potential to occur within the targeted study area within EL30256 or the wider EL30256 (DotEE 2017b).

4.9 Sites of Conservation Significance

The targeted study area in the southern section of EL30256 does not intercept any Sites of Conservation Significance, but the northern section of EL30256 intersects the Mongrel Downs in the Central Tanami Desert (20-1-4) is of regional significance, Figure 10 (White *et al.* 2000b).

The Western Tanami Paleo-drainage Systems (20-1-3) is of national significance occurs east of the EL30256 lease areas. These sites are recognised by the Northern Territory Government as being the most important sites for biodiversity conservation (White *et al.* 2000b).



Legend (Veg ID 1 - NVIS Level 2 Desc)

Closed forest	Sparse tussock grassland
Mid closed forest	Hummock grassland
Open forest	Open hummock grassland
Woodland	Forbland
Open woodland	Sparse samphire shrubland
Open shrubland	Inland salt lake
Sparse shrubland	Pastoral/Horticulture/roads
Open palmland	Plantations/roads
Closed tussock grassland	Rural/Residential/roads
Tussock grassland	Urban/Roads
Open tussock grassland	Unknown

Legend

- Target Study Area
- EL30256

Notes:
Imagery: SPOT 5 (CNES/Airbus DS)
Data: NT Government Atlas

Client:
Ferdie's Find Pty Ltd



0 2.5 5km
Scale: 1:250,000
GDA 1994 MGA Zone 52
CADRef: a2520_F003_05
Date: Apr 2017 Rev: A A3

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**Grave Yard Bore Project
Environment**
National Vegetation Information System

Figure:

5. CONCLUSIONS

Purpose of the desktop assessment was to identify ecological values that have the potential to be impacted by the proposed development activities on the Grave Yard Bore lease areas. The lease area (EL30256) consists of three areas, the northern area, the southern area and the target study area. This lease area occurs southwest of the Rabbit Flat Roadhouse and southwest of the Tanami Road.

The key findings highlighted the lack of known records of threatened species on the targeted study area. In view of the nature of the proposed localized and initial exploration activities within the targeted study any impacts should be minimal as the underlying landsystems, landforms, soils and vegetation are well represented outside the targeted study area. The exception to the latter is the soak on the western fringe of the targeted study area that is relatively restricted and as such may support a range of specialised flora and fauna species. Consequently every effort should be made to avoid the soak area on the western fringes of the targeted study area.

As the data on potential ecological values indicates that there is some potential for several threatened flora and fauna species to occur within the targeted study area on EL30256 it is recommended that if the project activities intensify beyond this initial phase then detailed flora and fauna studies are undertaken on the targeted study area.

6. REFERENCES

Atlas of Living Australia (2017)

Atlas of Living Australia; from <http://www/ala.org.au/>.

Brocklehurst P., Lewis D., Napier D. and Lynch D. (2007)

Northern territory Guidelines and Field Methodology for Vegetation Survey and Mapping. Technical Report No. 02/2007D. Department of Natural Resources, Environment and the Arts, Palmerston.

COAG Standing Committee on Environment and Water (2012)

Australia's Native Vegetation Framework, Australian Government, Department of Sustainability, Environment, Water, Population and Communities, Canberra.

Department of the Environment and Energy (2017a)

Matters of National Environmental Significance. Significant impact guidelines 1.1. Environment Protection and Biodiversity Conservation Act 1999. Department of the Environment and Energy, Canberra.

Department of the Environment and Energy (2017b)

EPBC Protected Matters Search Tool. Department of the Environment and Energy, Canberra.

Department of Natural Resources, Environment, the Arts and Sport (2010)

Land Clearing Guidelines. Department of Natural Resources, Environment, the Arts and Sport. Darwin, Northern Territory.

Department of Land Resource Management (2017a)

Bioregional Descriptions. From: <http://www/lrm.nt.gov.au/plants-and-animals/herbarium/nature/bioregional#>

Department of Land Resource Management (2017b)

Clearing 2017 Guidelines. Fact Sheets and reports. From: <http://www/lrm.nt.gov.au/land-clearing/clearing-guidelines,-fact-sheets-and-reports#>

Department of Land Resource Management (2017c)

Maps and Reports. Primary Vegetation Mapping Datasets. From: <http://www/lrm.nt.gov.au/natveg/vegmapping/datasets#>

Department of Land Resource Management (2017d)

NT NRM Infonet. From: <http://www/ntinfonet.org.au/lrm.nt.gov.au#>

Department of Land Resource Management (2017e)

Threatened Species. From: <http://www/lrm.nt.gov.au/plants-animals/threatened-species#>

Department of Natural Resources NRETAS (2010)

Land Clearing Guidelines. Department of Natural Resources, Environment, the Arts and Sport, Darwin.

Department of Sustainability, Environment, Water, Population and Communities (2012)

Environment Protection and Biodiversity Conservation Act 1999. Environmental Offset Policy. October 2012. Department of Sustainability, Environment, Water, Population and Communities, Canberra.

Department of Sustainability, Environment, Water, Population and Communities (2012)

Interim Biogeographic Regionalisation for Australia, Version 7.

EcOz Environmental Services (2012)

Dry Season Fauna Survey Old Pirate Prospect, Tanami Desert, N.T. Prepared by EcOz Environmental Services for ABM Resources.

McAlpin, S. (2001)

A recovery plan for the Great Desert Skink (Ergenia kintorei) 2001 to 2011, prepared for Arid Lands Environment Centre, Arid Lands Environment Centre Inc., Darwin, p.24.

Northern Territory EPA (2013)

Guidelines for Assessment of Impacts on Terrestrial Biodiversity. Northern Territory Environment Protection Authority. Version 2.0.

Northern Territory EPA (2013)

Northern Territory Guidelines on Environmental Offsets and Associated Approval Conditions. Northern Territory Environment Protection Authority. Version 2.0.

Pavey, C., Cole, J and Woinarski, J. (2006)

Threatened Species of the Northern Territory- Crest-tailed Mulgara (Ampurta) *Dasycercus cristicauda*; Information Sheet.

White, M., Albrecht, D. Duguid, A. Latz, P and Hamilton, M (2000a)

Plant Species and Sites of Botanical Significance in the Southern Bioregions of the Northern Territory. Vol 1: Significant Vascular Plants Part 1: Species of Significance.

White, M., Albrecht, D. Duguid, A. Latz, P and Hamilton, M (2000b)

Plant Species and Sites of Botanical Significance in the Southern Bioregions of the Northern Territory. Vol 2: Significant Sites Part 1: Site Descriptions.



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 is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

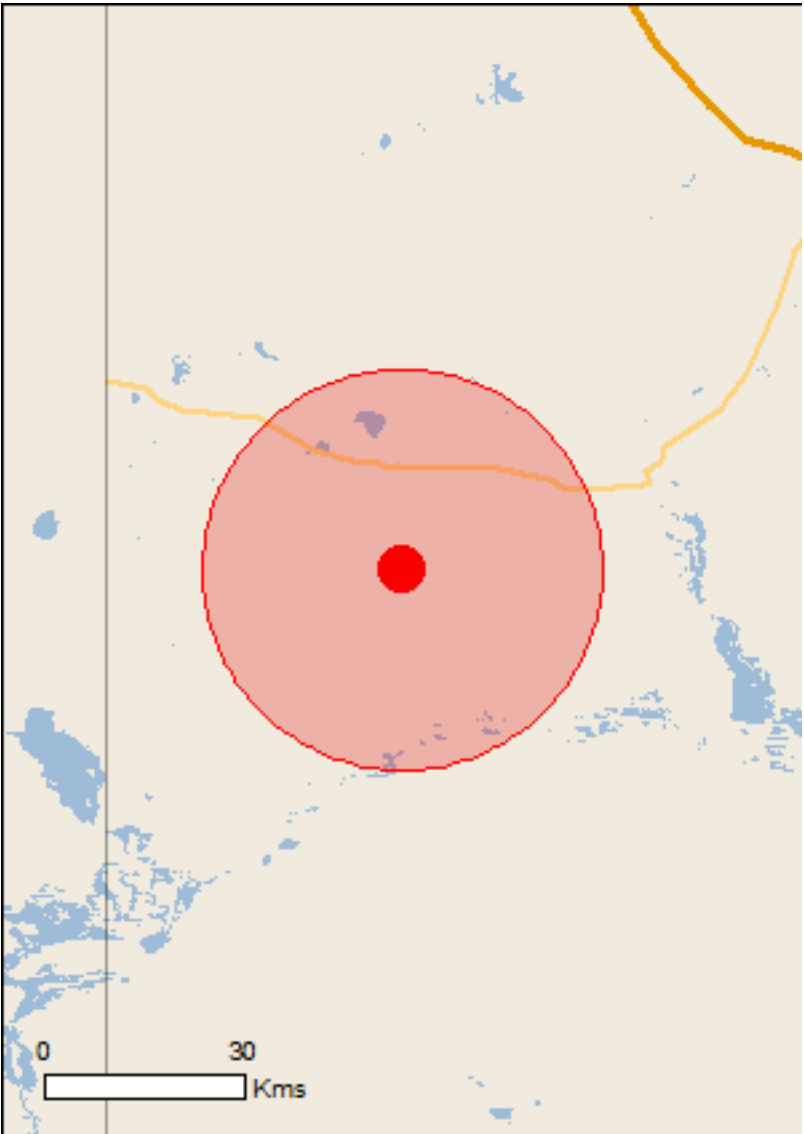
Report created: 28/03/17 18:40:08

- [Summary](#)
- [Details](#)

[Matters of NES](#)

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

[Extra Information](#)
- [Caveat](#)
- [Acknowledgements](#)



This map may contain data which are
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[Coordinates](#)

Buffer: 30.0Km



Summary

Matters of National Environmental 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](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	None
Listed Threatened Species:	7
Listed 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. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

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.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	11
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Commonwealth Reserves Marine:	None

Extra Information

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

State and Territory Reserves:	1
Regional Forest Agreements:	None
Invasive Species:	6
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Listed Threatened Species		[Resource Information]
Name	Status	Type of Presence
Birds		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Pezoporus occidentalis Night Parrot [59350]	Endangered	Species or species habitat may occur within area
Polytelis alexandrae Princess Parrot, Alexandra's Parrot [758]	Vulnerable	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat may occur within area
Mammals		
Macrotis lagotis Greater Bilby [282]	Vulnerable	Species or species habitat known to occur within area
Zyzomys pedunculatus Central Rock-rat, Antina [68]	Endangered	Species or species habitat may occur within area
Reptiles		
Liopholis kintorei Great Desert Skink, Tjakura, Warrarna, Mulyamiji [83160]	Vulnerable	Species or species habitat likely to occur within area
Listed 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 likely to occur within area
Migratory Terrestrial Species		
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area
Migratory Wetlands Species		
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[Resource Information]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Charadrius veredus Oriental Plover, Oriental Dotterel [882]		Species or species habitat may occur within area
Glareola maldivarum Oriental Pratincole [840]		Species or species habitat may occur within area
Hirundo rustica Barn Swallow [662]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Motacilla cinerea Grey Wagtail [642]		Species or species habitat may occur within area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat may occur within area

Extra Information

State and Territory Reserves	[Resource Information]
Name	State
Southern Tanami	NT

Invasive Species	[Resource Information]
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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 Resouces Audit, 2001.

Name	Status	Type of Presence
Mammals		
Camelus dromedarius Dromedary, Camel [7]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		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
Mus musculus House Mouse [120]		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		
Cenchrus ciliaris Buffel-grass, Black Buffel-grass [20213]		Species or species habitat may occur within area

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 and National Heritage properties, Wetlands of International and National 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 resolutions.

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 information sources.

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.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

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.

Coordinates

-20.69268 129.39873

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:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- [-Natural history museums of Australia](#)
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian 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, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- [-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.