



Appendix A

Radioactivity Analysis



TO WHOM IT MAY CONCERN

A sample of titanomagnetite concentrate from TNG Limited was submitted to ANSTO Minerals for analysis of natural radionuclides in the U-238, Th-232 and U-235 decay chains. The sample was analysed using the following techniques:

- Gamma spectrometry for U-238 and Th-232 decay progeny and U-235 and its decay progeny
- Alpha spectrometry for Po-210
- Delayed neutron activation (DNA) analysis for parent U-238
- Neutron activation analysis (NAA) analysis for parent Th-232

Elemental data, used for matrix corrections in gamma spectrometry, was provided by the client.

The results of the analysis are given in the attached "Certificate of Analysis". At this time, the Ra-226 and Th-232 results are indicative only for the following reasons:

1. The client required a quick turnaround on the sample analysis. In gamma spectrometry, a sample must be left for three weeks to allow radon daughters (used to determine Ra-226) to equilibrate prior to counting. The sample was counted immediately after loading and will therefore need to be recounted to determine the true Ra-226 concentration.
2. NAA is a nuclear technique which can take up to six weeks to complete, depending on reactor availability. Given the time constraints, Th-232 analysis could not be completed and therefore an estimate of the concentration has been reported based on the results of its decay progeny, Ra-228 and Th-228.

Based on the current reported results, the titanomagnetite concentrate is not considered to be radioactive. A material is considered to be radioactive under the National Directory¹ if the concentration of any radionuclide in the U-238, Th-232 and U-235 decay chains exceeds 1000 Bq/kg or 100,000 Bq/kg for K-40. This conclusion is not expected to change when final results are reported.

Dr Sue Brown, Senior Radiochemist
16 July 2014

¹ RPS No. 6 – National Directory for Radiation Protection (NDRP) (including amendments 1 to 6) February 2014 (www.arpsa.gov.au).

CERTIFICATE OF ANALYSIS

Certificate Number: 14GAM119
Company / Organisation: TNG Limited
AM Request Number: 1401120
Sample Identification: Titanomagnetite Concentrate
Analysis Requested: Natural Radioactivity – Gamma and Alpha Spectrometry

Radionuclide	Activity (Bq/kg)	% Uncertainty (1)
²³⁸ U	< 4.4	
²³⁰ Th	< 35	
²²⁶ Ra	4.7 ^a	10
²¹⁰ Pb	< 10	
²¹⁰ Po	11	45
²³² Th	6.9 ^b	10
²²⁸ Ra	7.1	10
²²⁸ Th	6.7	10
²³⁵ U	< 2.3	
²³¹ Pa	< 6.8	
²²⁷ Ac	< 1.3	
²²⁷ Th	< 0.1.3	
⁴⁰ K	15	11

^a Indicative only at this stage. The sample will be recounted after secular equilibrium is established between Ra-226 and its short-lived daughters, Pb-214 and Bi-214, which are the gamma emitting radionuclides measured to determine the Ra-226 concentration.

^b The Th-232 decay chain is considered to be in secular equilibrium, based on the measured concentrations of the decay progeny, Ra-228 and Th-228. The Th-232 concentration reported is an average the concentrations of these two radionuclides.

Dr Sue Brown, Senior Radiochemist

Date: 16 July 2014



Appendix B

Flora and Fauna Assessment Report, Additional Works





TNG Limited
Mount Peake Project
Flora and Fauna Assessment Report, Additional Works

March 2017

Executive summary

TNG Limited (TNG) is proposing to develop the Mount Peake Project (the project), located approximately 235 kilometres (km) north-west of Alice Springs and approximately 50 km west of the Stuart Highway. GHD Pty Ltd (GHD) was engaged by TNG to undertake flora, vegetation and fauna assessments for the proposed project. The results of these assessments are outlined in GHD (2015a, b) and are included in a draft Environmental Impact Statement (EIS) prepared for the Project and submitted to the Northern Territory Environment Protection Authority (EPA) in February 2016.

GHD was engaged by TNG to undertake an additional flora, vegetation and fauna assessment of areas not previously surveyed (referred to as the 'additional survey area').

Key results

- Six broad vegetation communities were identified and mapped within the additional survey area. All of the vegetation communities identified align with the vegetation types previously described by GHD (2015b). No nationally or regionally significant vegetation communities were recorded within the additional survey area.
- The additional survey area comprised 101 flora species with 98 native and three exotic species recorded. All of the flora species recorded during the field survey have previously been recorded in the project area.
- No threatened, near threatened or endemic flora species were recorded within the additional survey area. One species (*Acacia murrayana*) listed as having bioregional conservation significance was recorded within the additional survey area.
- Targeted searching for *Ipomoea polpha* subsp. *latzii* (Giant Sweet Potato) in mulga vegetation in areas east, west and north of the Anmateyerr North Site of Conservation Significance have been undertaken with no individuals located.
- Five fauna habitat types were identified within the additional survey area, including Mulga woodland, riparian woodland, rock rises, spinifex grassland and *Corymbia* woodland. The habitat types align with those previously described by GHD (2015a).
- Fifty-three species of fauna were detected (observed, heard, signs) from survey locations within and adjacent to the additional survey area. Of these, 39 had been recorded during previous surveys for the project (GHD 2015a) with 14 species newly recorded for the project area.
- No threatened fauna species were recorded within the additional survey area. However, one species (Australian Bustard – *Ardeotis australis*), listed as near threatened under the *Territory Parks and Wildlife Conservation Act 2006* (TPWC Act) was recorded in the additional survey area.
- A review of the fauna likelihood of occurrence assessment, conducted as part of GHD (2015a), was undertaken based on the habitats present within the additional survey area. No additional fauna species listed under the TPWC Act and/or *Environment Protection and Biodiversity Conservation Act 1999* are considered likely to occur in the additional survey area.

Table of contents

1.	Introduction.....	1
1.1	Background.....	1
1.2	Objectives of the assessment.....	1
1.3	Definitions	1
1.4	Limitations and assumptions	2
2.	Methods.....	4
2.1	Desktop assessment.....	4
2.2	Field survey.....	4
2.3	Assumptions and limitations	7
3.	Results	8
3.1	Desktop results	8
3.2	Survey results	9
4.	References	14

Table index

Table 1	Land systems mapped within the additional survey area	8
Table 2	Vegetation types within the project area.....	10

Appendices

Appendix A – Figures

Appendix B – Desktop searches

Appendix C – Flora species list

Appendix D – Fauna observations

1. Introduction

1.1 Background

TNG Limited (TNG) is proposing to develop the Mount Peake Project (the project), located approximately 235 kilometres (km) north-west of Alice Springs and approximately 50 km west of the Stuart Highway (Figure 1, Appendix A). The project will consist of:

- The mining of a polymetallic ore body through an open-cut truck and shovel operation
- Processing of the ore to produce a magnetite concentrate
- Road haulage of the concentrate approximately 100 km to a new railway siding and loadout facility on the Alice Springs to Darwin railway near Adnera
- Rail transport of the concentrate to TNG's proposed Darwin Processing Facility at Middle Arm.

GHD was engaged by TNG to undertake flora, vegetation and fauna assessments of the proposed mine site, accommodation camp facilities area, access road and rail siding loading facility. The results of these assessments are outlined in GHD (2015a, b) and are included in a draft Environmental Impact Statement (EIS) prepared for the project (GHD 2016) submitted to the Northern Territory Environment Protection Authority (EPA) in February 2016.

1.2 Objectives of the assessment

GHD was engaged by TNG to undertake an additional flora, vegetation and fauna assessment of areas not previously surveyed. The purpose of this assessment is to satisfy comments by the EPA on the draft EIS with regard to flora, vegetation and fauna. The objectives of this report are to:

- Describe and map vegetation communities occurring within areas not previously surveyed
- Evaluate vegetation condition with regard to anthropogenic disturbance such as the presence of introduced flora, evidence of clearing or heavy livestock impact
- Map the extent exotic (weed) species listed under the *Weeds Management Act 2001* (WM Act) and/or other significant weed infestations within the additional survey area
- Discuss the targeted searching undertaken for *Ipomoea polpha* subsp. *latzii* within the additional survey area and other parts of the project area
- Assess fauna habitat types occurring within the additional survey area and identify areas likely to support threatened species, drawing on information collected for the initial fauna assessment (GHD 2015a).

1.3 Definitions

1.3.1 Additional survey area

The additional survey area covers includes:

- Borefield delivery pipeline, borefield access road and indicative bore locations: The delivery pipeline and adjacent borefield access road extend approximately 45 km from the northern part of the borefield to the mining area. The survey included a 200 m corridor along the proposed delivery pipeline and borefield access road (including the indicative bore locations)

- Seven borrow pits: The borrow pits are located along the proposed access road corridor. The borrow pits largely occur within the proposed road access corridor previously surveyed by GHD (2015a, b)
- Six water bores: The water bore locations are all within the proposed access road corridor previously surveyed by GHD (2015a, b).

1.3.2 Study area

The study area refers to the area previously surveyed as part of GHD (2015b). It included MLA 28341, MLA 29855 and MLA 29856 (specifically the mining area and accommodation camp facilities area), an approximately 1 km wide corridor along the proposed site access road, the rail loadout facility and the area within and immediately surrounding Mud Hut Swamp.

1.3.3 Project area

The project area refers to the area required for the project and includes the study area and additional survey area. The project area includes the mining area, accommodation camp facilities area, an approximately 1 km wide corridor along the proposed site access road, the rail siding storage loading facility, the borefield delivery pipeline and access road, borrow pits and water bore locations.

1.3.4 Locality

The locality refers to the area within a 20 km buffer of the project area.

1.4 Limitations and assumptions

This report has been prepared by GHD for TNG and may only be used and relied on by TNG for the purpose agreed between GHD and the TNG as set out in section 1.2 of this report.

GHD otherwise disclaims responsibility to any person other than TNG arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

The services undertaken by GHD in connection with preparing this report were limited to those specifically detailed in the report and are subject to the scope limitations set out in the report.

The opinions, conclusions and any recommendations in this report are based on conditions encountered and information reviewed at the date of preparation of the report. GHD has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared.

The opinions, conclusions and any recommendations in this report are based on assumptions made by GHD described in this report. GHD disclaims liability arising from any of the assumptions being incorrect.

GHD has prepared this report on the basis of information provided by TNG and others who provided information to GHD (including Government authorities), which GHD has not independently verified or checked beyond the agreed scope of work. GHD does not accept liability in connection with such unverified information, including errors and omissions in the report which were caused by errors or omissions in that information.

The opinions, conclusions and any recommendations in this report are based on information obtained from, and testing undertaken at or in connection with, specific sample points. Site conditions at other parts of the site may be different from the site conditions found at the specific sample points.

Investigations undertaken in respect of this report are constrained by the particular site conditions, such as the location of access tracks and vegetation. As a result, not all relevant site features and conditions may have been identified in this report.

Site conditions may change after the date of this Report. GHD does not accept responsibility arising from, or in connection with, any change to the site conditions. GHD is also not responsible for updating this report if the site conditions change.

2. Methods

2.1 Desktop assessment

Prior to completing the field survey, a desktop literature and database review was undertaken to gain an understanding of the ecological context of the additional survey area. The review was limited to the GHD Flora and Vegetation, and Fauna Assessment Reports (2015a, b) to verify the previously reported ecological context of the study area and locality, as well as the following databases and literature sources:

- The Department of the Environment and Energy (DotEE) Protected Matters Search Tool (PMST) to identify Matters of National Environmental Significance (*Environment Protection and Biodiversity Conservation Act 1999*) potentially occurring in the locality (20 km buffer). Information was downloaded in the form of an Environmental Report in November 2016
- NT land systems/vegetation mapping of the Southern Alice Springs District to determine the broad vegetation types previously mapped within the additional survey area.

2.2 Field survey

2.2.1 Vegetation and flora

The vegetation and flora survey was conducted by a GHD botanist from 21 to 24 November 2016, in accordance with a *Territory Parks and Wildlife Conservation Act 2006* (TPWC Act) permit issued to GHD by the Northern Territory Parks and Wildlife Commission (Permit number 59188, expiry date 31 December 2016). Flora survey techniques used in the baseline survey was consistent with the *Northern Territory Guidelines and Field Methodology for Vegetation Survey and Mapping* (Brocklehurst *et al.* 2007).

Flora quadrats

Survey sites for vegetation mapping and habitat characterisation included the collection of data from 17 quadrats (quadrat size was 20 x 20 m or in the case of riparian areas 10 x 40 m). For each quadrat surveyed, the following data were recorded:

- Site location including GPS coordinates
- General site description
- Habitat information including patch size, aspect, drainage, geology, soil type and texture, estimated soil depth as well as percentage cover of:
 - Ground cover (pebbles/gravel/stones/small rocks/rocks/large rocks and boulders)
 - Litter
 - Bare earth
 - Ground layer vegetation
 - Crust
 - Exposed rock
 - Gravel
- Structural information for the tree, shrub and ground strata including estimated percentage cover, height range and average height for each stratum as well as average height and percentage cover of each growth form present within the quadrat (i.e. tree, shrub, tussock grass, forb etc.)

- Degree of site disturbance including grazing intensity and fire frequency
- A full inventory of all flora species present along with heights and projected foliage covers for each taxa.

A handheld Trimble Nomad GPS unit was used to record spatial locations of quadrats and site photograph was taken from the north-east corner of each quadrat. The location of each quadrat is shown in Figure 2, Appendix A.

Secondary check sites

To assist with vegetation mapping, data was collected from two check sites according to methods described in Brocklehurst *et al.* (2007). At these sites dominant species in the canopy, mid and ground strata were recorded along with their average height and percentage cover. The location of each check site is shown in Figure 2, Appendix A.

Opportunistic collections

While travelling from site to site, flora taxa not previously recorded within quadrats or check sites were noted. This ensured that a comprehensive species list was produced for the additional survey area.

Vegetation mapping

The classification of vegetation 'types' within the additional survey area was based on dominant flora species present within each structural layer (i.e. canopy, shrub and ground layers). Vegetation types were aligned with previously described types (e.g. GHD 2015b) where possible.

Vegetation types were described according to the National Vegetation Information System (NVIS), Level V: Association, which encompasses a description of the broad structural formation (e.g. woodland, canopy height and percentage cover) and the dominant species in three strata (Upper overstorey, Midstorey and Ground Layer) (Brocklehurst *et al.* 2007).

The NVIS description identifies the following characteristics of a community:

- Landform/lithology
- Dominant stratum (layer)
- Dominant species
- Average height and height range
- Cover (percentage canopy cover for upper layers (trees and shrubs) and percentage cover for ground vegetation)
- Growth form (e.g. tree, shrub, tussock grass, Brocklehurst *et al.* 2007).

Mapping of vegetation communities was undertaken at 1:20,000 scale (GDA94) by visually interpreting Google Earth aerial imagery captured at c. 1:10 000 scale (Google Earth 2013).

Threatened flora

Targeted surveys were undertaken for threatened flora species that could potentially occur within the additional survey area given known distributions, previous records in the locality and habitat requirements for each species. Random meander transects, according to the methods of Cropper (1993), were focused in areas of potentially suitable habitat. These random meander transects were conducted opportunistically whilst ground-truthing vegetation mapping.

Nomenclature

Identifications of flora were made in the field using CSIRO (2006), Jessop (1981), Maslin (2014), Moore (2005), Sharp and Simon (2002) and Woinarski *et al.* (2007).

The nomenclature applied is consistent with the Northern Territory Flora Checklist (Short *et al.* 2011), the NT Southern Region Flora Checklist (Albrecht *et al.* 2007) and the Mabblerley update to family nomenclature adopted by the NT Herbarium.

All plants observed were identified to species level where possible. The absence of certain diagnostic features (this is a function of the seasonal cycles of flora species) prevented identification of some plants to species level; these were identified to family or genus level.

Introduced flora

Locations of significant infestations of introduced flora were marked on a Trimble GPS unit, including species present, and an estimate of the density and extent of infestations.

2.2.2 Fauna

The fauna habitat assessment was conducted by a GHD zoologist from 21 to 24 November 2016, concurrently with the vegetation and flora survey. The fauna survey included an assessment of sites within and adjacent to the additional survey area. Methods followed the standard terrestrial vertebrate survey methods used by the Department of Land Resource Management (DLRM) (Appendix A in EPA 2013). Explanatory notes are provided below.

1. *Habitat assessment* – Habitat assessments were completed at flora quadrat and check site locations within and adjacent to the additional survey area. They included an assessment of the habitats for their likelihood of supporting threatened fauna species, and their degree of similarity to habitats previously described in other parts of the project area (GHD 2015a).
2. *Bird surveys (Instantaneous Bird Count)* – Bird surveys involved compiling a list of all birds seen, heard or otherwise detected in the vicinity of habitat assessment sites. Typically, for this assessment, the standard NT 'instantaneous' bird count method was used from a single point, then the survey effort was increased by moving gradually around a 50 m x 50 m area to survey a 1 ha area (approximately) over a 20-minute time period (approximately). Given the purpose of the assessment was primarily to assess vegetation characteristics and habitat, bird observations were largely opportunistic and were made throughout the day (i.e. not limited to early morning and late afternoon).
3. *Opportunistic observations* – Opportunistic observations were made throughout the assessment, and included recording other signs of fauna that were encountered, such as tracks, diggings and scats.

Threatened Fauna

During the habitat assessment of the additional survey area, opportunistic searches for threatened fauna species or signs of their presence were undertaken. No targeted surveys were completed as part of this assessment.

Nomenclature

Common and scientific names for birds follow Christidis and Boles (2008). The fauna database was used for the nomenclature of mammals, reptiles and amphibians.

2.3 Assumptions and limitations

Scope of the surveys

Vascular flora and terrestrial vertebrate fauna were sampled during the survey. The fauna assessment focused on species of terrestrial vertebrate fauna (mammals, birds, reptiles and amphibians). Existing databases and species prediction tools are biased towards vertebrates. The occurrence of terrestrial invertebrates and aquatic fauna (fish and aquatic invertebrates) were not assessed as part of this survey. Unlike terrestrial vertebrate fauna, there are relatively few data or identification tools available for terrestrial invertebrates in the region. Free standing water, other than at cattle watering points, was not present during the survey period.

Mapping

The vegetation of the additional survey area was mapped at a scale of 1: 20,000 using Goggle Earth aerial imagery captured at c. 1:10,000 scale. Boundaries between vegetation communities usually form a transition zone or mosaic where the two communities meet. For the purpose of vegetation mapping a line needs to be drawn between two communities. Boundaries on the vegetation map are therefore not exact.

Data was recorded in the field using hand-held GPS tools (e.g. Nomad Juno and Garmin GPS). Certain atmospheric factors and other sources of error can affect the accuracy of GPS receivers. The Garmin GPS units used for this survey are accurate to within ± 10 m on average. Therefore, the data points consisting of coordinates recorded from the GPS may contain inaccuracies.

Timing/weather/season/cycle

The vegetation and flora survey was a single season survey and was conducted during 21-24 November 2016. In the three months prior to the survey (August-October), the Territory Grape Farm (No. 015643, BoM 2017) recorded 27.2 mm of rainfall. This total is similar to the long-term average for the same period (August-October; 29.2 mm) (BoM 2017). Similarly, in the 12 months prior to the survey (November-October), the Territory Grape Farm recorded 333.2 mm of rainfall, which is similar to the long-term average for the same period (November-October: 320.7 mm) (BoM 2017). The weather conditions recorded during the survey are unlikely to have impacted the vegetation and flora survey.

The portion of flora collected and identified was considered high, however, it is likely that the survey under recorded grass species (Poaceae) and some forbs (e.g. Asteraceae and Goodeniaceae) which appeared to have largely senesced at the time of survey.

3. Results

3.1 Desktop results

3.1.1 EPBC Act Protected Matters Search Tool

The EPBC Act PMST results identified no additional flora or fauna taxa to those reported in GHD (2015a, b). A copy of the PMST report is provided in Appendix B.

3.1.2 Land system classification

The additional survey area is covered by land system mapping of the Alice Springs area, which has been completed at a scale of 1:1,000,000 as part of surveys carried out by the Division of Land Research and Regional Survey between 1956 and 1957. Eight broad land systems have been mapped across the additional survey area (Table 1).

Table 1 Land systems mapped within the additional survey area

Code	Land System	Landform	Soil Description	Vegetation
Bo (6)	Boen	Plains with convex interfluvies and broad shallow valleys	Red earths, lateritic in part	Mulga in groves over short grass or <i>Eragrostis eriopoda</i> (woollybutt)
Bu (67)	Bushy Park	Plains	Red earths	<i>Acacia aneura</i> (Mulga) in groves over short grass or <i>Eragrostis eriopoda</i>
Da (23)	Davenport	Rounded uplands, crests and convex stony slopes	Shallow, stony sandy soils	Sparse shrubs and low trees over spinifex
Hn (10)	Hann	Rugged ranges and adjacent plains	Shallow, stony, undifferentiated soils	Mulga with ± <i>Eucalyptus</i> over spinifex
Ib (27)	Ilbunric	Alluvial plains, unchannelled surfaces	Red earths, some red clayey sands	Mulga/sparse shrubs over short grasses and forbs
Sa (78)	Sandover	Active inner plains and major channels	Alluvial soils and sands	Red River gum in channels, sparse low trees, minor Mulga over short grasses and forbs.
Sn (78)	Singleton	Parallel, reticulate and irregular sand dunes with stable flanks	Red dune sands and red clayey sands	Spinifex
WI (a) (65)	Woolla	Low platforms and drainage floors	Shallow sandy calcareous earths and red earths	Sparse low trees over short grass; Some plains of red clayey sands and spinifex

3.1.3 NVIS vegetation types

The available vegetation mapping covering the area is 1:1,000,000 scale mapping of the NT (mapped at NVIS Level IV: Sub-Formation). GHD (2015b) identified four NVIS vegetation types occurring within the additional survey area:

- +*Acacia* tall open shrubland / *Acacia* sparse shrubland / *Eragrostis* low open tussock grassland
- +*Eucalyptus* low open woodland / *Acacia* open shrubland / *Chrysopogon* (mixed) low grassland
- +*Acacia* tall sparse shrubland / *Acacia* low sparse shrubland / *Fimbristylis* low grassland
- *Acacia* tall sparse shrubland / *Acacia* sparse shrubland / +*Triodia* low open hummock grassland.

3.2 Survey results

3.2.1 Vegetation types

Six broad vegetation communities were identified and mapped within the additional survey area. All of the vegetation communities identified align with the vegetation types previously described by GHD (2015b).

Vegetation types identified within the project area (inclusive of the additional survey area) are summarised in Table 2 and mapped in Figure 2, Appendix A. Detailed descriptions of each vegetation type are provided in GHD (2015b).

3.2.2 Vegetation condition

Vegetation across the additional survey area was generally in good condition with little anthropologic disturbance and high species richness. High to moderate level impacts from pastoral activities (trampling, grazing and weed invasion) are localised and generally confined to watering points, ephemeral watercourses, wetlands and stockyards. In these areas, a reduction in ground cover species and soil erosion was also observed.

No significant infestations of exotic flora were observed within the additional survey area.

3.2.3 Threatened vegetation communities

Nationally and regionally significant vegetation communities

No nationally or regionally significant vegetation communities were recorded within the additional survey area. Furthermore, no nationally or regionally significant vegetation communities have been recorded within the project area.

Table 2 Vegetation types within the project area

Veg. Code	Vegetation Type	NVIS Description (Level III Broad Floristic Formation)	NVIS Description (Level V Association)	Area (ha)	Sample locations
VT 1	Low open Eucalyptus woodland on limestone	Triodia hummock grassland	U [^] <i>Eucalyptus socialis</i> subsp. <i>eucentrica</i> , <i>Eucalyptus pachyphylla</i> , <i>Corymbia opaca</i> / [^] tree mallee, tree/6/r M [^] <i>Acacia ligulata</i> , <i>Senna artemisioides</i> subsp. <i>artemisioides</i> , <i>Senna artemisioides</i> subsp. <i>filifolia</i> / [^] Shrub/3/r G ⁺ <i>Triodia longiceps</i> , <i>Scaevola glabrata</i> , <i>Ptilotus obovatus</i> / [^] hummock grass, forb/3/c	318.63	Q25, Q26, Q29
VT 2	Mulga shrubland on sandy red earths	Acacia shrubland	U ⁺ <i>Acacia aptaneura</i> , <i>Acacia kempeana</i> , <i>Acacia aneura</i> / [^] shrub/6/i M [^] <i>Sida platycalyx</i> , <i>Eremophila latrobei</i> subsp. <i>glabra</i> / [^] shrub/3/r G ⁺ <i>Aristida inaequiglumis</i> , <i>Eragrostis eriopoda</i> , <i>Aristida holathera</i> / [^] tussock grass/1/i	6,872.44	Q05, Q12, Q13, Q15, Q16, Q27, Q28, Q31, Q40, Q44, Q49, Q56, Q62
VT 3	Riparian woodland along watercourses and drainage channels	Eucalyptus open woodland	U ⁺ <i>Eucalyptus camaldulensis</i> var. <i>obtusata</i> , <i>Erythrina vespertilio</i> , <i>Atalaya hemiglaucal</i> / [^] tree/7/r M [^] <i>Acacia cuthbertsonii</i> , <i>Jasminum calcarium</i> , <i>Senecio magnificus</i> / [^] Shrub/3/r G ⁺ <i>Eulalia aurea</i> <i>Themeda avenacea</i> , <i>Cyperus centralis</i> / [^] tussock grass, sedge /2/i	220.48	Q04, Q08, Q20, Q24, Q35, Q42, Q46, Q48, Q50, Q58
VT 4	Low Corymbia woodland on loamy alluvial plains	Tussock grassland	U [^] <i>Corymbia opaca</i> , <i>Atalaya hemiglaucal</i> , <i>Hakea macrocarpa</i> / [^] tree/6/r M [^] <i>Acacia kempeana</i> , <i>Acacia ligulata</i> , <i>Senna artemisioides</i> subsp. <i>helmsii</i> / [^] shrub/4/r G ⁺ <i>Eragrostis eriopoda</i> , <i>Aristida inaequiglumis</i> , <i>Triodia pungens</i> / [^] tussock grass, hummock grass /1/r	232.43	Q14, Q21, Q22, Q23, Q45, Q59
VT 5	Floodplains dominated by <i>Eucalyptus victrix</i>	Eucalyptus open woodland	U ⁺ <i>Eucalyptus victrix</i> , <i>Acacia estrophiolata</i> +/- <i>Eucalyptus camaldulensis</i> subsp. <i>obtusata</i> / [^] tree /7/i M [^] <i>Eremophila latrobei</i> subsp. <i>latrobei</i> , <i>Indigofera colutea</i> / shrub /3 /r G ⁺ <i>Eragrostis cylindriflora</i> , <i>Fimbristylis dichotoma</i> , <i>Portulaca oleracea</i> / tussock grass, forb /1/r	478.54	Q06, Q07, Q19
VT 6	Triodia grassland on sandy plains	Triodia hummock grassland	U [^] <i>Corymbia opaca</i> , <i>Atalaya hemiglaucal</i> / [^] tree/6/bi M [^] <i>Acacia kempeana</i> , <i>Acacia aptaneura</i> , <i>Senna</i> spp. / [^] shrub/6/i +G ⁺ <i>Triodia pungens</i> , <i>Eragrostis eriopoda</i> , <i>Aristida inaequiglumis</i> / [^] hummock grassland, tussock grassland/1/c	5,335.28	Q01, Q09, Q10, Q11, Q17, Q18, Q30, Q32, Q34, Q38, Q39, Q43, Q47, Q51, Q53, Q54, Q55, Q60
VT 7	Low Acacia shrubland on rocky slopes	Triodia hummock grassland	U [^] <i>Atalaya hemiglaucal</i> , <i>Hakea macrocarpa</i> / [^] tree/6/bi M [^] <i>Acacia spondylophylla</i> , <i>Grevillea wickhamii</i> , <i>Acacia adsurgens</i> / [^] shrub/3/i +G ⁺ <i>Triodia basedowii</i> , <i>Eragrostis eriopoda</i> , <i>Aristida inaequiglumis</i> / [^] hummock grassland, tussock grassland/1/c	172.01	Q02, Q03, Q36, Q37, Q41, Q61
VT 8	Tall Acacia shrubland on stony quartz	Acacia shrubland	U [^] <i>Acacia georginae</i> , <i>Atalaya hemiglaucal</i> / [^] tree /6/bi M ⁺ <i>Acacia aneura</i> , <i>Senna</i> spp. / [^] shrub G ⁺ <i>Enneapogon clelandii</i> , <i>Themeda triandra</i> , <i>Sida filiformis</i> / [^] tussock grass forb /1/i	222.55	Q33, Q57
Cleared				48.09	
TOTAL				13,900.45	

3.2.4 Flora diversity

One hundred and one flora taxa representing 30 families and 66 genera were recorded within the additional survey area during the field survey. This total comprised 98 native species and three exotic species. A further two collections could not be identified to beyond family due to a lack of flowering parts.

All of the flora taxa recorded during the 2016 field survey have been previously been recorded in the project area (GHD 2015b).

A flora species list for the additional survey area is provided in Appendix C.

3.2.5 Threatened flora

Nationally and state significant flora

No flora species listed as threatened under the TPWC Act and/or EPBC Act were recorded within the additional survey area during the field survey.

Near threatened flora

No flora species classified as near threatened were recorded within the additional survey area. Based on a likelihood of occurrence assessment, one species, *Ipomoea polpha* subsp. *latzii* (Giant Sweet Potato) was considered likely to occur based on the presence of suitable habitat at the base of ranges that occur in the south of the project area along the proposed access road (GHD 2015b).

Ipomoea polpha subsp. *latzii* is endemic to the Burt Plain Bioregion and only known from a small area near Ti Tree. The species grows in *Acacia* shrublands (particularly Mulga) on red earth soils and occasionally on adjacent sandplains with *Triodia basedowii*. All known populations are within a few kilometres of low rocky ranges and experience some degree of rainfall 'runon' (Threatened Species Scientific Committee 2010). The proposed road alignment intersects the Anmatyerr North Site of Conservation Significance in an area where the vegetation has been described as Mulga shrubland on sandy red earths with small areas of *Triodia pungens* grasslands on sandy plains. No rocky ranges have been recorded in the vicinity of this area. Targeted searches for the Giant Sweet Potato have not been undertaken directly within Anmatyerr North Site (due to lack of access). However, searches for the species in mulga vegetation in areas east and west of this area have been undertaken with no individuals located. Furthermore, areas of mulga shrublands within Anmatyerr North Site, north of the current project area have also been searched with no individuals located.

Endemic species

No flora species endemic to the Northern Territory were recorded within the additional survey area.

Regionally significant flora

One species listed as having bioregional conservation significance was recorded within the additional survey area. *Acacia murrayana* is considered regionally significant as its record represents the northern limit of its range within the Burt Plain Bioregion. *Acacia murrayana* has been previously been recorded in the project area (GHD 2015b).

3.2.6 Introduced flora species

Three exotic flora species were recorded within the additional survey area:

- **Cenchrus ciliaris* (Buffel Grass)
- **Citrullus lanatus* (Bitter Melon)
- **Vachellia farnesiana* (Mimosa bush).

None of these species are listed as weeds of national environmental significance (WONS) or proclaimed under the WM Act.

The three exotic flora species have been previously been recorded in the project area (GHD 2015b).

3.2.7 Fauna habitats

Five fauna habitat types were identified within the additional survey area, including Mulga woodland, riparian woodland, rock rises, spinifex grassland and *Corymbia* woodland. The habitat types align with those previously described in GHD (2015a). Detailed descriptions of each habitat type are provided by GHD (2015a).

3.2.8 Fauna observations

Fifty-three species were detected (observed, heard, signs) from the sites assessed within and adjacent to the additional survey area. These include two mammals (one native and one non-native), 46 birds and 5 reptiles. A fauna species list for the additional survey area is provided in Appendix D.

Of the 53 species observed, 39 had been recorded during previous surveys for the project (GHD 2015a). The observations of 14 species (26% of the species recorded) were new for the project area and included:

- Eleven species not recorded by GHD (2015a), but listed on DLRM Atlas for the project area (Black-faced Cuckoo-shrike, Cockatiel, Diamond Dove, Horsfield's Bronze-cuckoo, Little Woodswallow, Red-backed Kingfisher, Red-browed Pardalote, Rufous Songlark, Variegated Fairy-wren, Western Gerygone and Long-nosed Dragon)
- One species not recorded by GHD (2015a) nor listed on DLRM Atlas for the project area (Sacred Kingfisher)
- One species predicted to occur by PMST as EPBC Act-listed threatened species (Vulnerable), but not recorded by GHD (2015a), nor listed on DLRM Atlas for the project area (Great Desert Skink). Additional information on this sighting is reported in GHD (2017)
- One species predicted to occur by PMST as invasive species, but not recorded by GHD (2015a), nor listed on DLRM Atlas for the project area (Camel [feral]).

The proportionally high number of new species recorded is likely to reflect differences in time of year, seasonal conditions, and landscape condition between the April 2013 (GHD 2015a) and November 2016 (this assessment) surveys.

3.2.9 Threatened fauna

No fauna species listed as threatened under the TPWC Act and/or EPBC Act were recorded within the additional survey area during the field survey. One species of bird detected at a water bore and cattle watering location near Q55 is listed as near threatened under the TPWC Act: Australian Bustard (*Ardeotis australis*).

Approximately 3 km south of that water bore, a single Great Desert Skink (*Liopholis kintorei*) was observed fleetingly during November 2016 survey, on the edge of an access track in open sandplain within spinifex (*Triodia spp.*) understorey. The observation location is outside of the project area, and lies approximately 7 km from the proposed access road. Subsequent searches of the area surrounding the sighting failed to detect any further signs of this species, such as communal burrow systems or latrines.

A fauna likelihood of occurrence assessment based on threatened, near threatened and data deficient species identified in desktop searches was completed in GHD (2015a). A review of that likelihood of occurrence assessment was undertaken based on the habitats present within the additional survey area. No additional fauna species listed under the TPWC Act and/or EPBC Act are considered likely to occur in the additional survey area.

In terms of their character and condition, the habitats present within the additional survey area are similar to those that occur in other parts of the project area. The open spinifex habitat at one location (Q54) appeared potentially suitable for the Greater Bilby (*Macrotis lagotis*), in much the same way as habitats along the proposed site access road, which was the focal area for a targeted fauna survey (GHD 2017). A more extensive search of the area around Q54 was made for any signs of threatened fauna, but no evidence of the Bilby or other threatened species were detected.

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Appendices

Appendix A – Figures

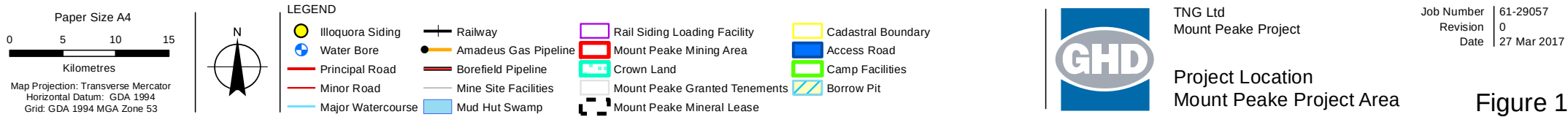
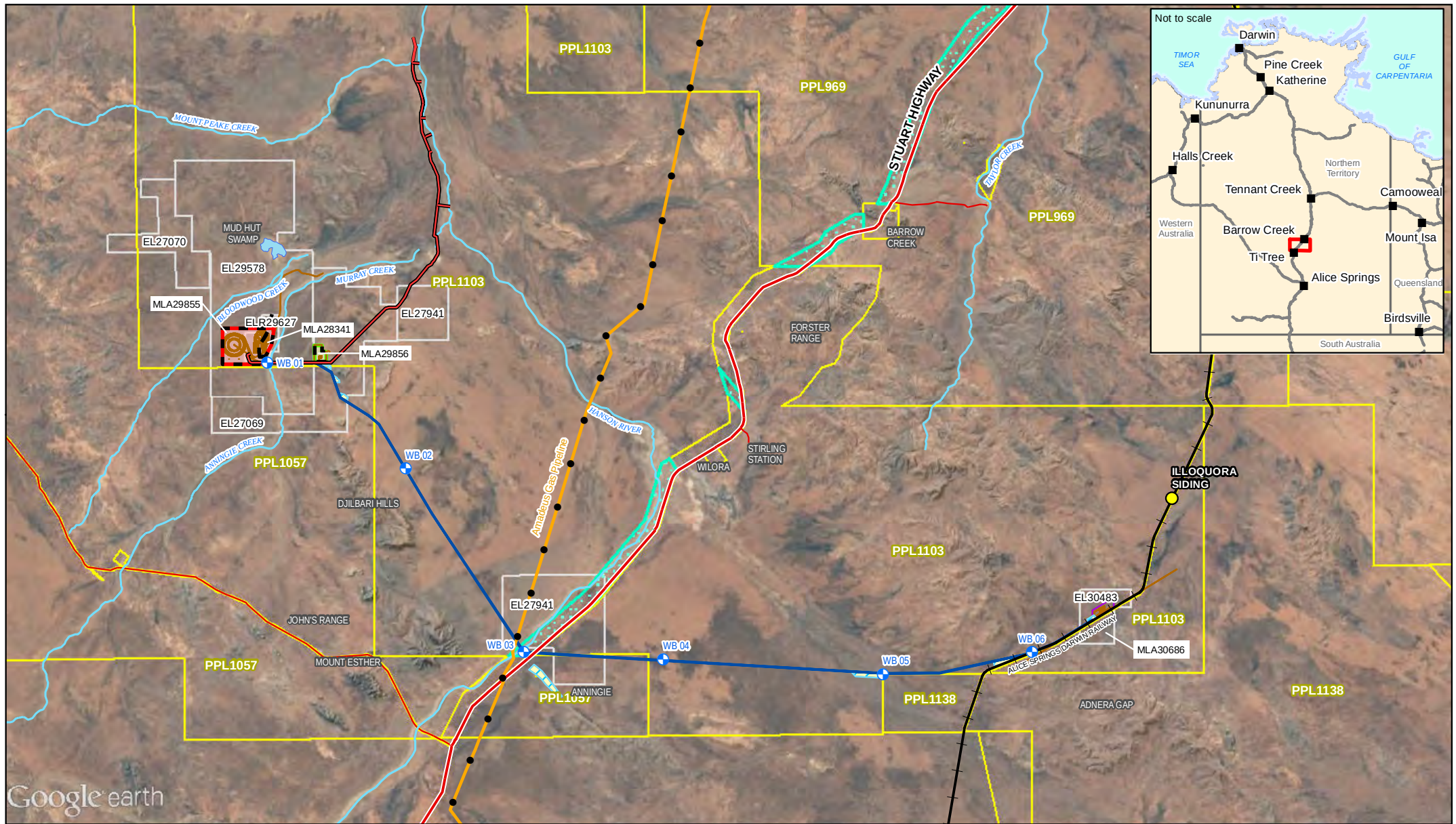
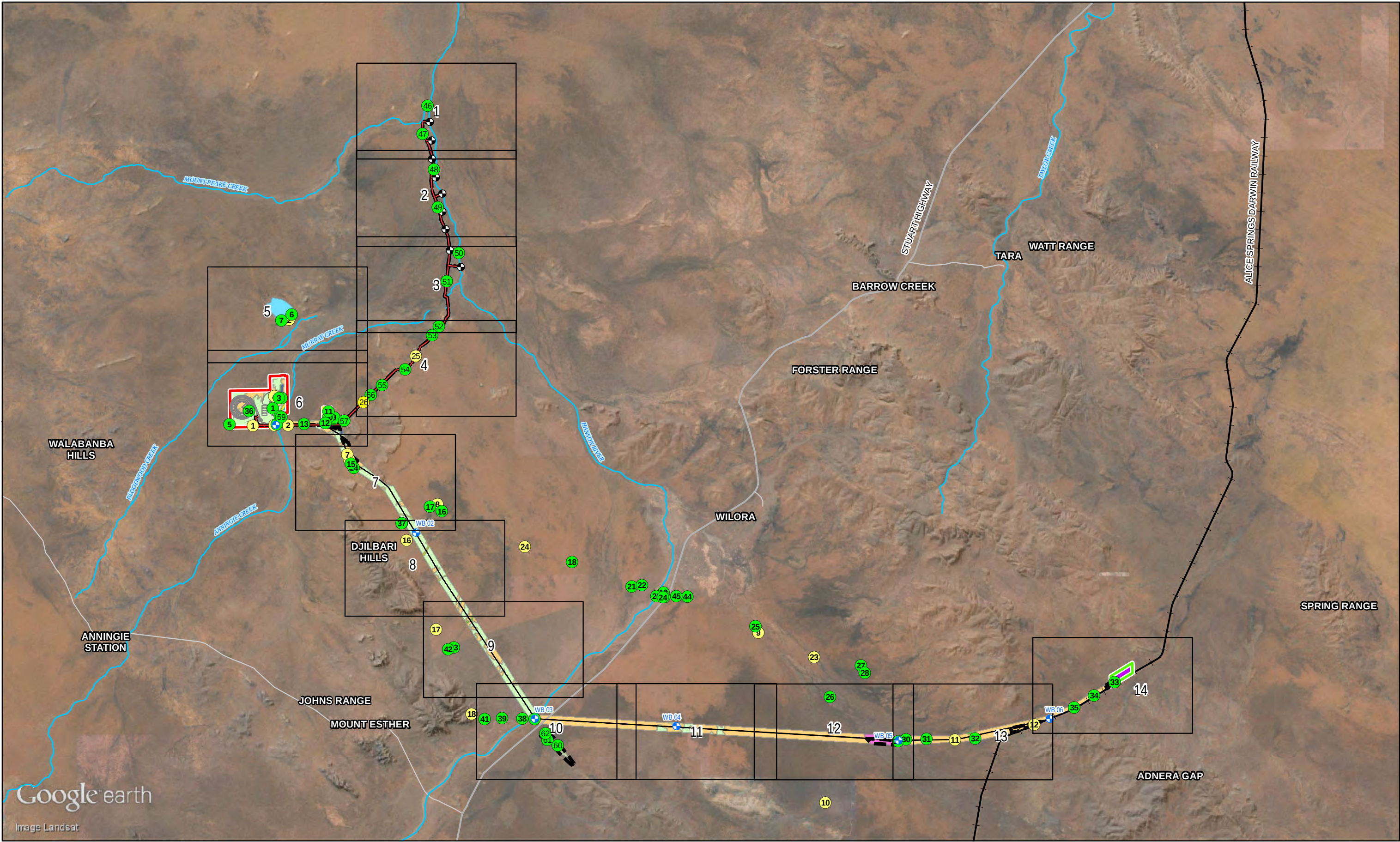
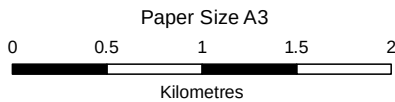
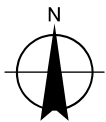


Figure 1





Map Projection: Transverse Mercator
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Grid: GDA 1994 MGA Zone 53



LEGEND

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|----------------------------|------------------------------|--|---|
| Water Bore | Mine layout | Borrow Pit | 4 Low Corymbia open woodland on loamy alluvial plains |
| Bore Location (Indicative) | Major Watercourse | Camp Facilities | 5 Floodplains dominated by <i>Eucalyptus victrix</i> |
| Flora Survey Locations | Principal Road | Access Road Corridor | 6 Triodia grasslands and sandy plains |
| Check Sites | Minor Road | Vegetation Communities | 7 Low Acacia shrubland on rocky slopes |
| Borefield Pipeline | Rail Siding Loading Facility | 1 Low open Eucalyptus woodland on limestone ridges | 8 Tall Acacia shrubland on stony quartz |
| | Mount Peake Mining Area | 2 Mulga shrubland on sandy red earths | Cleared |
| | | 3 Riparian woodland along watercourses and drainage channels | |



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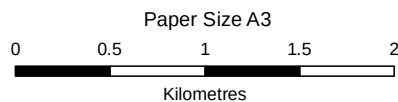
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Revision	0
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Page 1 of 14
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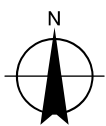
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LEGEND

- Water Bore
- Bore Location (Indicative)
- Flora Survey Locations
- Check Sites
- Borefield Pipeline

- Mine layout
- Major Watercourse
- Principal Road
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Vegetation Communities

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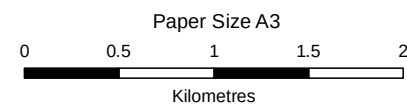
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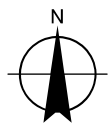
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LEGEND

- Water Bore
- Bore Location (Indicative)
- Flora Survey Locations
- Check Sites
- Borefield Pipeline

- Mine layout
- Major Watercourse
- Principal Road
- Minor Road
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- 6 Triodia grasslands and sandy plains
- 7 Low Acacia shrubland on rocky slopes
- 8 Tall Acacia shrubland on stony quartz
- Cleared



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Job Number 61-29057
Revision 0
Date 27 Mar 2017

Page 3 of 14
Figure 2

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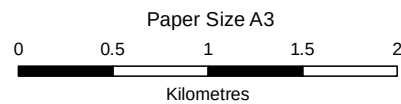
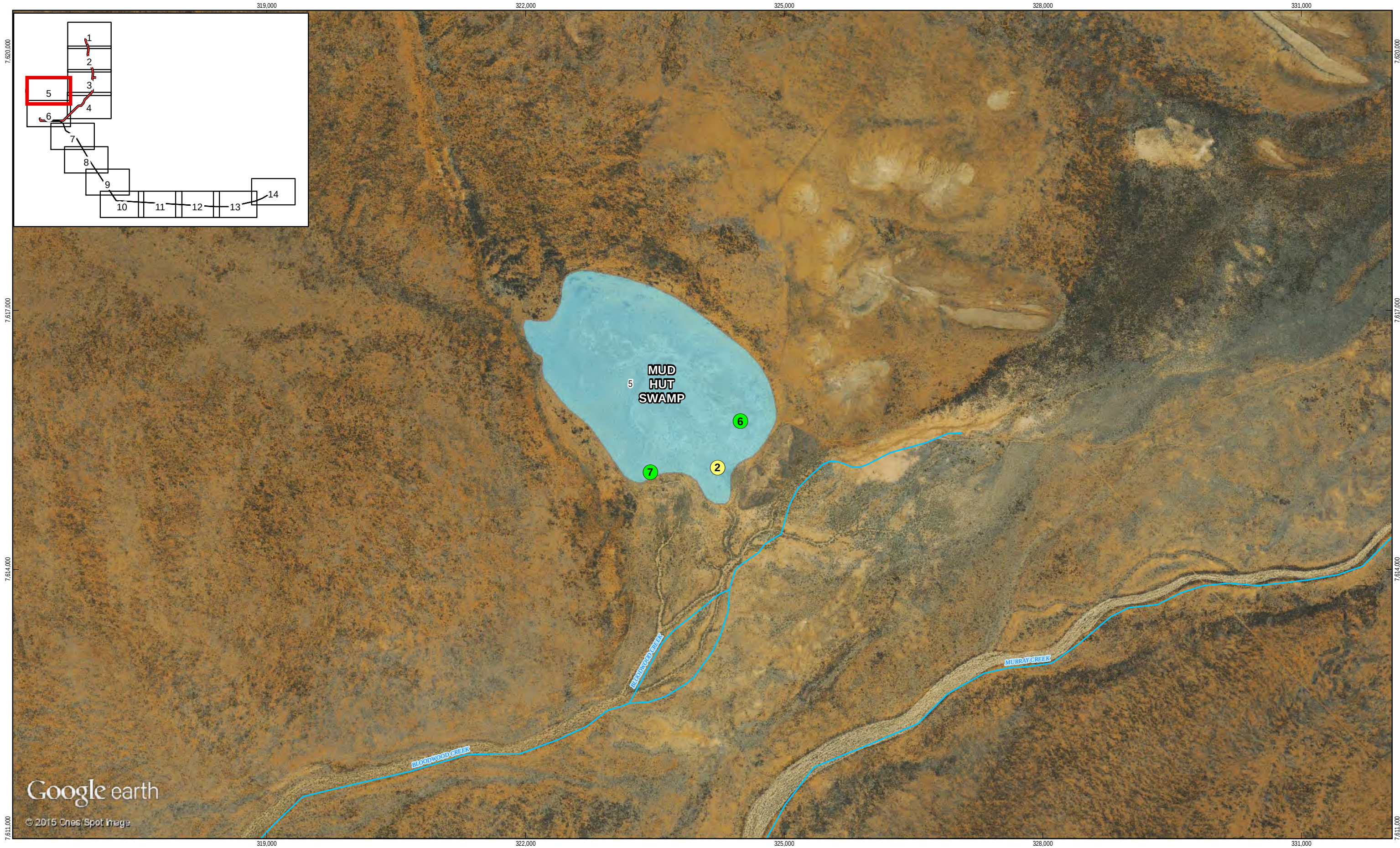
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Borefield Pipeline	Rail Siding Loading Facility	1 Low open <i>Eucalyptus</i> woodland on limestone ridges	8 Tall <i>Acacia</i> shrubland on stony quartz
	Mount Peake Mining Area	2 <i>Mulga</i> shrubland on sandy red earths	Cleared
		3 Riparian woodland along watercourses and drainage channels	

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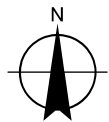
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Job Number 61-29057
Revision 0
Date 27 Mar 2017

Page 4 of 14
Figure 2



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LEGEND

- Water Bore
- Bore Location (Indicative)
- Flora Survey Locations
- Check Sites
- Borefield Pipeline

- Mine layout
- Major Watercourse
- Principal Road
- Minor Road
- Rail Siding Loading Facility
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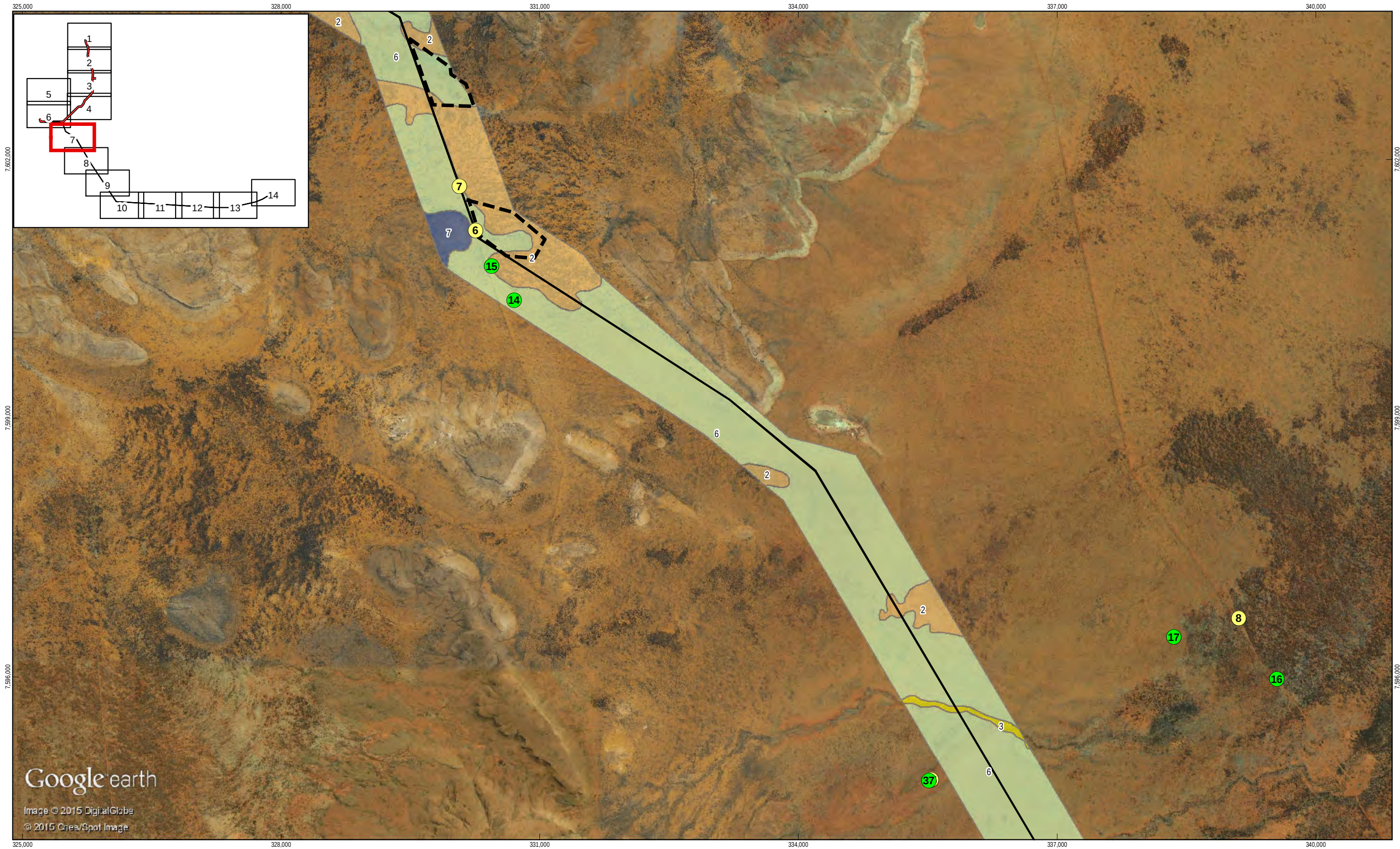
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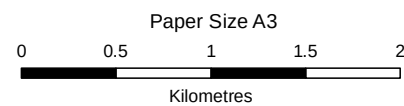
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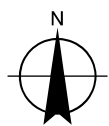


Google earth

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Grid: GDA 1994 MGA Zone 53



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- Bore Location (Indicative)
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Revision 0
Date 27 Mar 2017

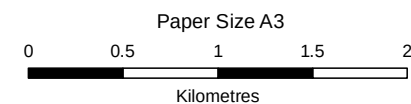
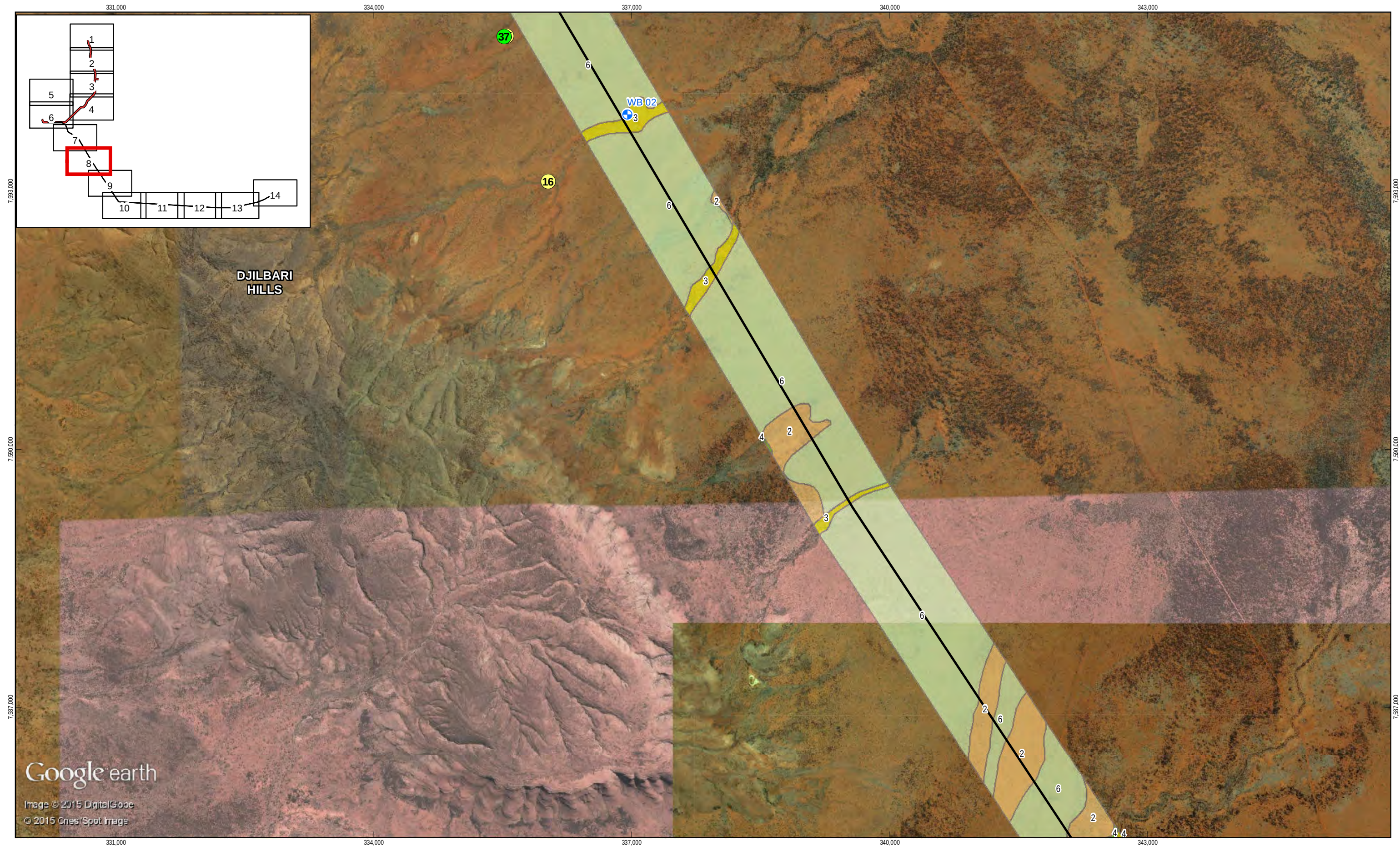
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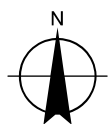
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LEGEND

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- Borefield Pipeline

- Mine layout
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Mount Peake Project

Additional flora and
vegetation assessment

Job Number 61-29057
Revision 0
Date 27 Mar 2017

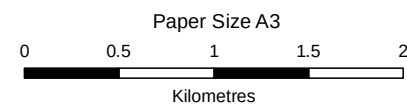
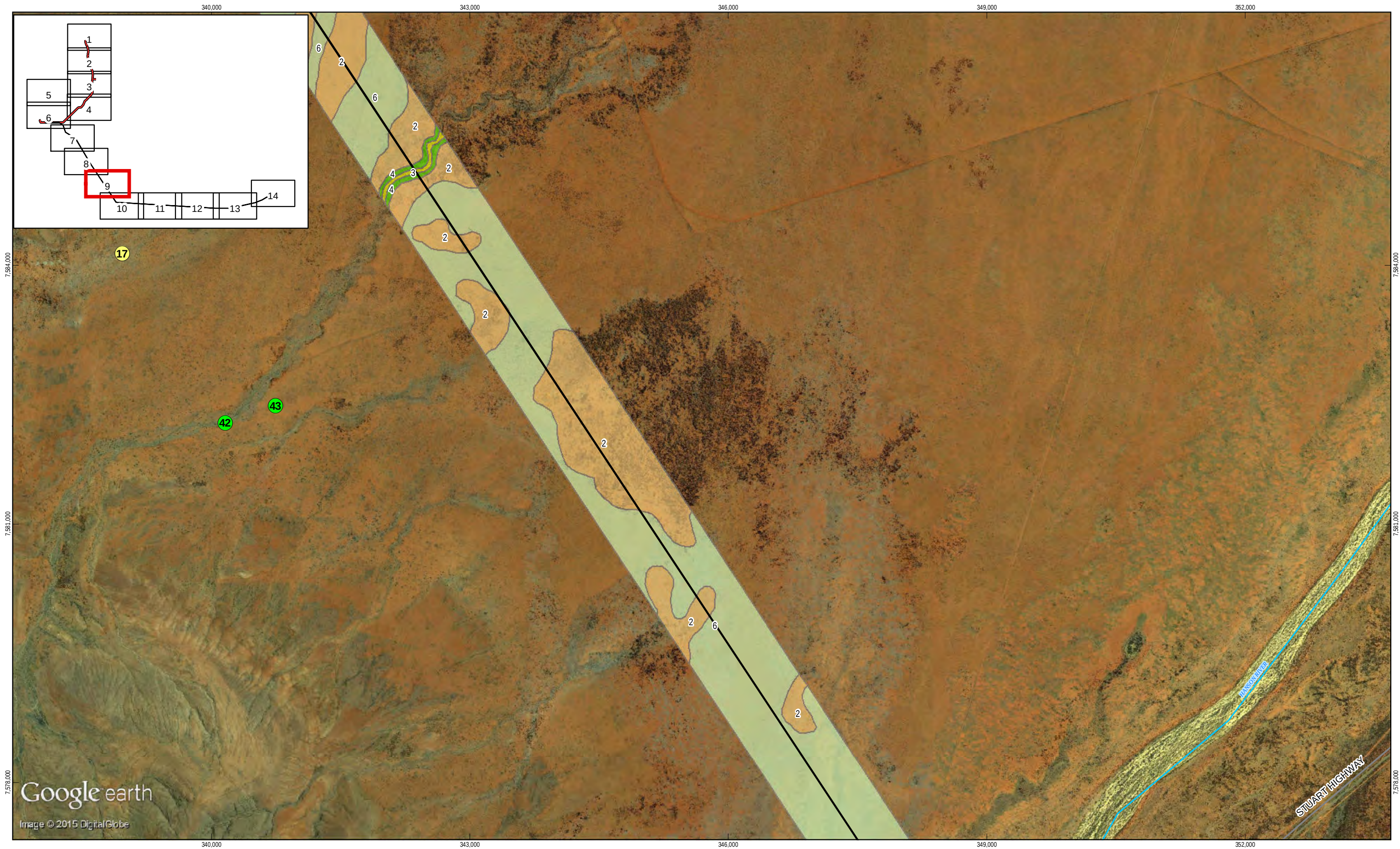
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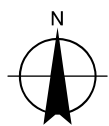
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Grid: GDA 1994 MGA Zone 53



LEGEND

- Water Bore
- Bore Location (Indicative)
- Flora Survey Locations
- Check Sites
- Borefield Pipeline

- Mine layout
- Major Watercourse
- Principal Road
- Minor Road
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- Mount Peake Mining Area

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- 1 Low open Eucalyptus woodland on limestone ridges
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- 5 Floodplains dominated by *Eucalyptus victrix*
- 6 Triodia grasslands and sandy plains
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- Cleared



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Job Number 61-29057
Revision 0
Date 27 Mar 2017

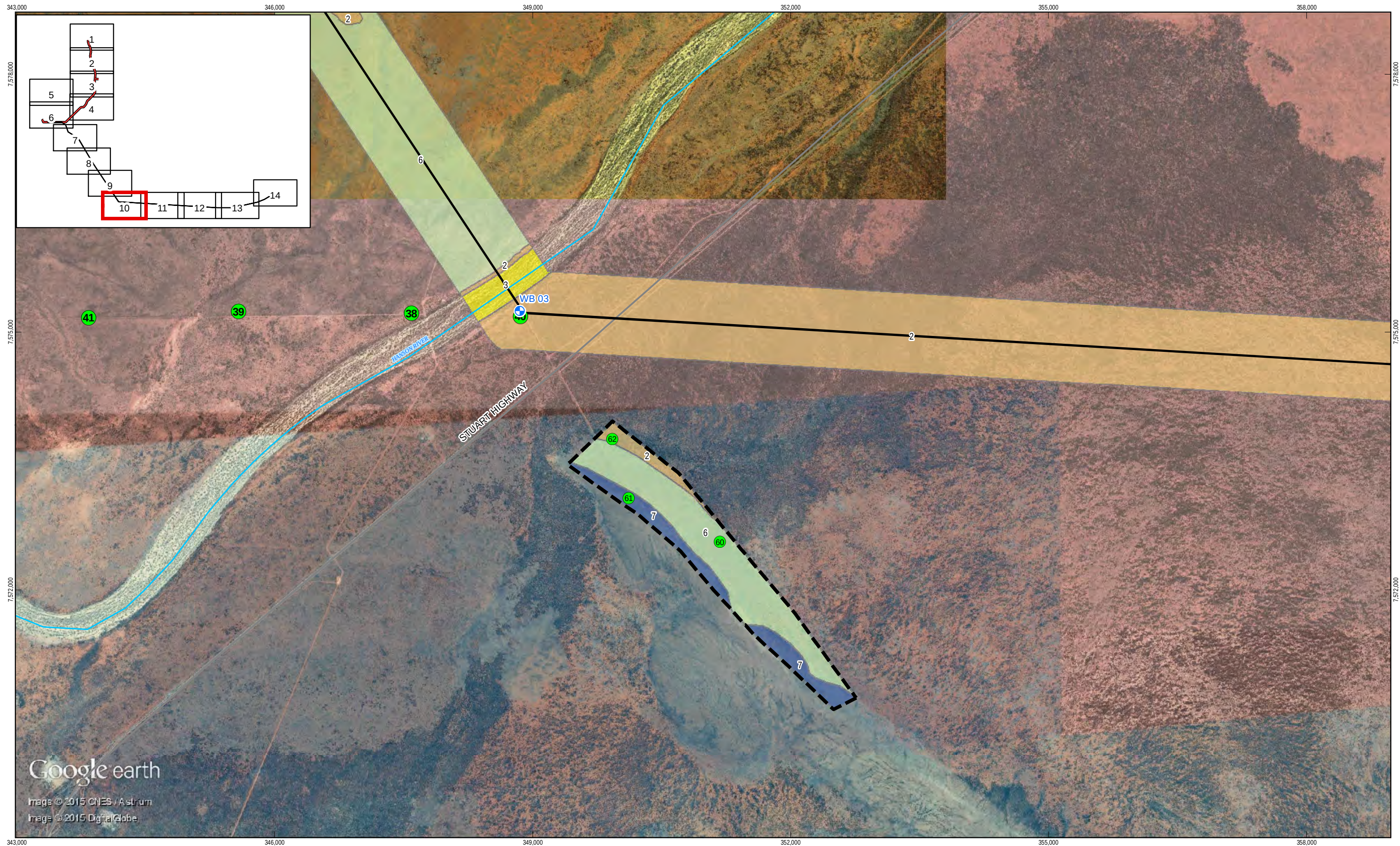
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Figure 2

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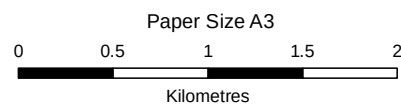
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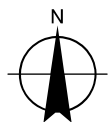
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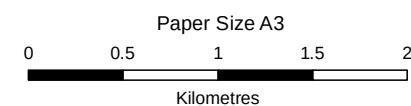
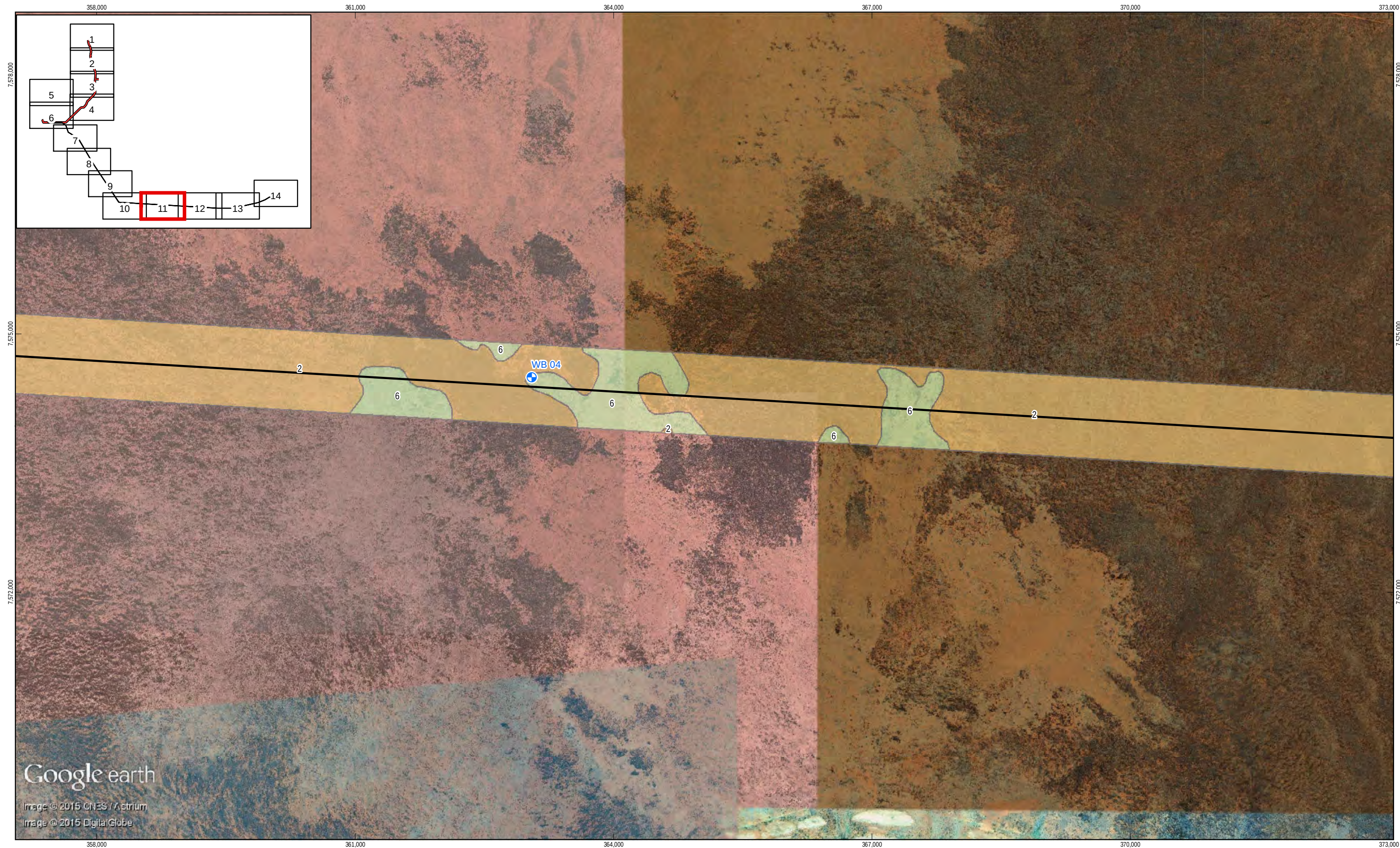
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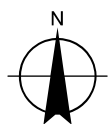
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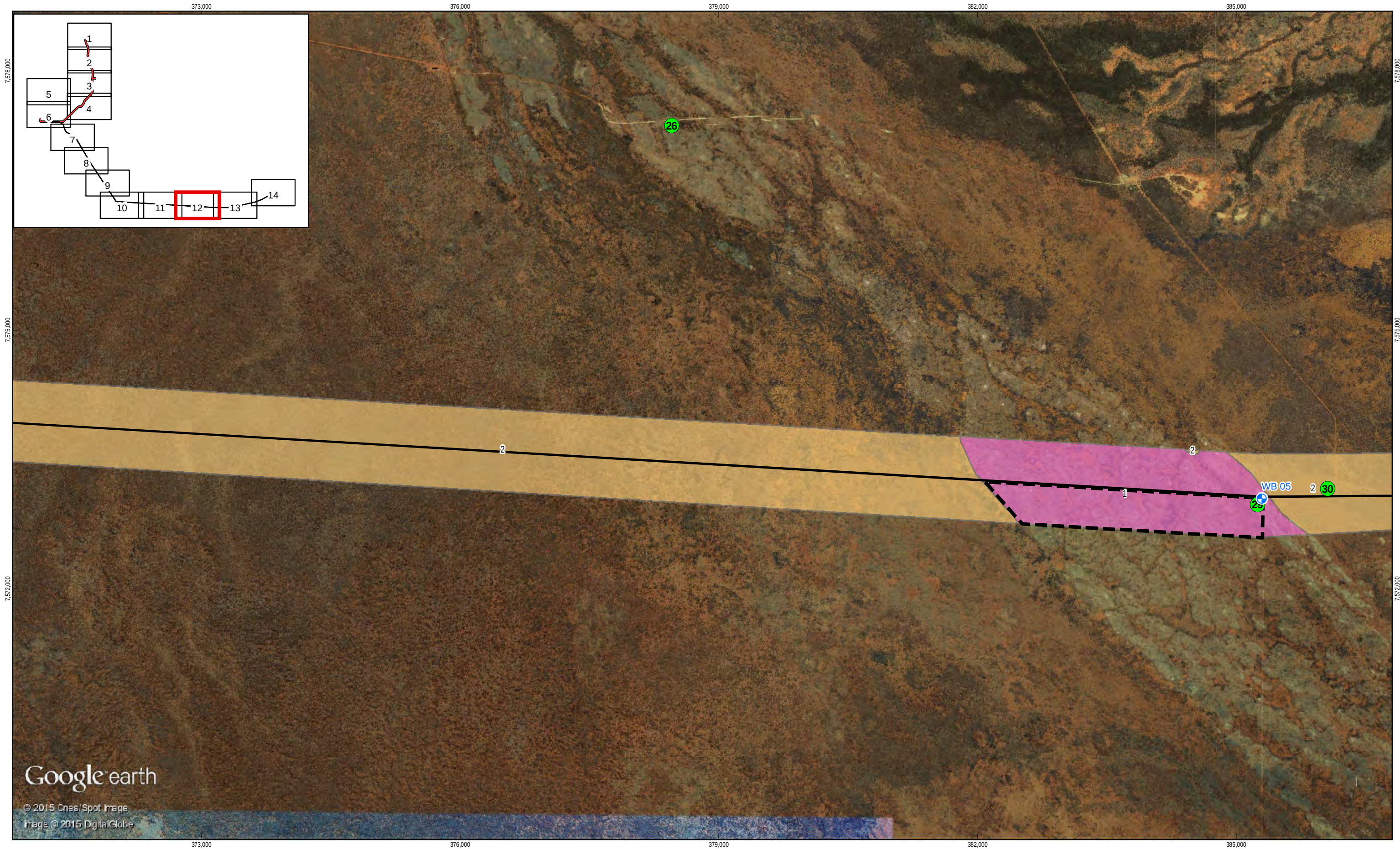
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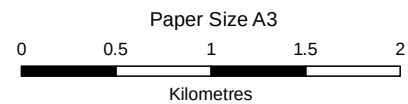
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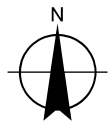


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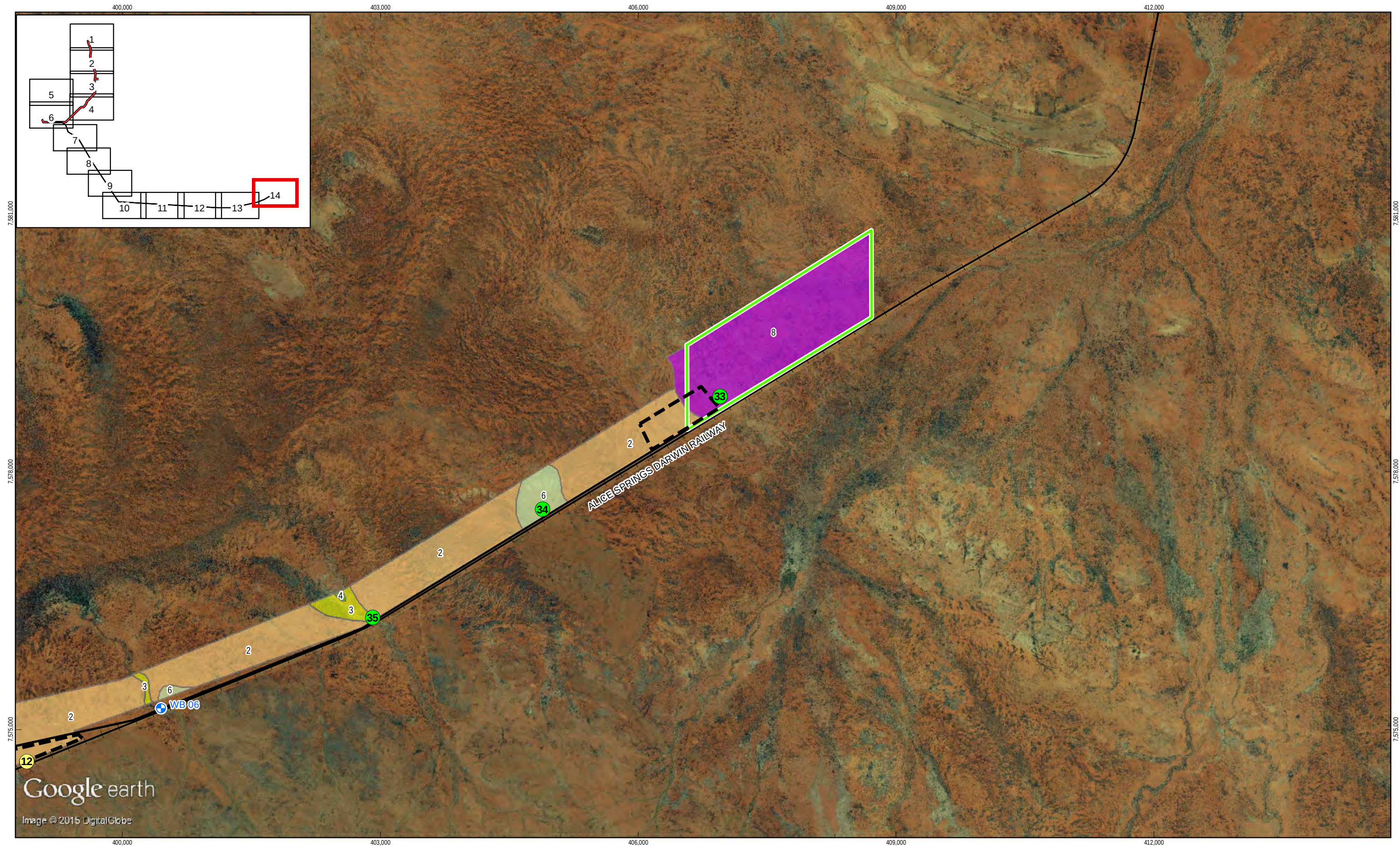
Page 12 of 14
Figure 2

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Additional flora and
vegetation assessment

Job Number 61-29057
Revision 0
Date 27 Mar 2017

Page 14 of 14
Figure 2

Appendix B – Desktop searches



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: 22/03/17 18:19:36

[Summary](#)

[Details](#)

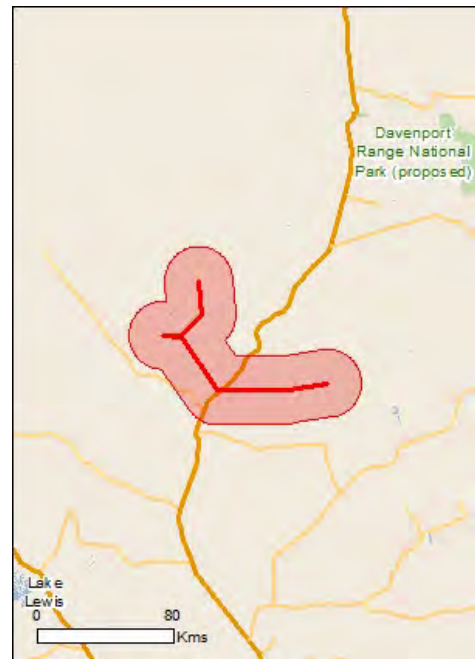
[Matters of NES](#)

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

[Extra Information](#)

[Caveat](#)

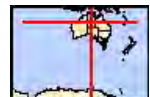
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[Coordinates](#)

Buffer: 20.0Km



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:	8
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:	11
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
Erythroriorchis radiatus Red Goshawk [942]	Vulnerable	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 likely to occur within area
Petrogale lateralis MacDonnell Ranges race Waru, Black-footed Rock-wallaby (MacDonnell Ranges race) [66649]	Vulnerable	Species or species habitat known to occur within area
Plants		
Eleocharis papillosa Dwarf Desert Spike-rush [2519]	Vulnerable	Species or species habitat known 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

Name	Threatened	Type of Presence
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

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
Central Mount Stuart	NT

Invasive Species	[Resource Information]
------------------	--

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resources Audit, 2001.

Name	Status	Type of Presence
Birds		
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area

Mammals

Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
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 likely to occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Prosopis spp. Mesquite, Algaroba [68407]		Species or species habitat likely to occur within area

Reptiles		
Hemidactylus frenatus Asian House Gecko [1708]		Species or species habitat likely to 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

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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](#)
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- [-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.

Appendix C – Flora species list

Flora species list for the additional survey area

Family	Taxon	Status	VT2	VT3	VT4	VT6	VT7	VT8
Adiantaceae	<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>		x					
Amaranthaceae	<i>Alternanthera nana</i>			x				
Amaranthaceae	<i>Ptilotus obovatus</i>					x	x	
Araliaceae	<i>Trachymene glaucifolia</i>					x		
Asteraceae	Asteraceae sp.		x					
Asteraceae	<i>Pluchea dentex</i>			x				
Asteraceae	<i>Pterocaulon serrulatum</i> var. <i>serrulatum</i>		x	x		x		
Asteraceae	<i>Pterocaulon spathulata</i>			x				
Boraginaceae	<i>Heliotropium tanythrix</i>			x				
Capparaceae	<i>Cleome viscosa</i>					x		
Chenopodiaceae	<i>Enchylaena tomentosa</i> subsp. <i>tomentosa</i>		x					x
Chenopodiaceae	<i>Rhagodia eremaea</i>					x		x
Chenopodiaceae	<i>Sclerolaena cornishiana</i>					x		
Convolvulaceae	<i>Convolvulus remotus</i>			x				
Convolvulaceae	<i>Evolvulus alsinoides</i>		x	x	x	x		
Convolvulaceae	<i>Ipomoea muelleri</i>			x				
Cucurbitaceae	<i>Citrullus lanatus</i>	*		x				
Cucurbitaceae	<i>Cucumis maderaspatanus</i>			x				
Cyperaceae	<i>Cyperus centralis</i>			x				
Euphorbiaceae	<i>Euphorbia australis</i>					x		
Euphorbiaceae	<i>Euphorbia coghlanii</i>		x	x				
Euphorbiaceae	<i>Euphorbia tannensis</i>			x		x	x	
Euphorbiaceae	<i>Microstachys chamaelea</i>		x	x				
Fabaceae	<i>Acacia adsurgens</i>					x	x	
Fabaceae	<i>Acacia aneura</i>		x			x		

Family	Taxon	Status	VT2	VT3	VT4	VT6	VT7	VT8
Fabaceae	<i>Acacia aptaneura</i>		x			x		x
Fabaceae	<i>Acacia cowleana</i>			x	x			
Fabaceae	<i>Acacia georgiana</i>				x	x		x
Fabaceae	<i>Acacia holosericea</i>			x				
Fabaceae	<i>Acacia inaequilatera</i>					x		x
Fabaceae	<i>Acacia kempeana</i>		x	x	x	x	x	x
Fabaceae	<i>Acacia melleodora</i>					x	x	
Fabaceae	<i>Acacia monticola</i>						x	
Fabaceae	<i>Acacia murrayana</i>		x					
Fabaceae	<i>Acacia spondylophylla</i>						x	
Fabaceae	<i>Crotalaria eremaea</i>			x		x		
Fabaceae	<i>Erythrina vespertilio</i>			x				
Fabaceae	<i>Indigofera colutea</i>		x	x				
Fabaceae	<i>Indigofera linnaei</i>			x		x		
Fabaceae	<i>Senna artemisioides</i>				x	x		
Fabaceae	<i>Senna artemisioides</i> subsp. <i>alicia</i>					x	x	x
Fabaceae	<i>Senna artemisioides</i> subsp. <i>artemisioides</i>		x		x	x	x	
Fabaceae	<i>Senna artemisioides</i> subsp. <i>filifolia</i>		x	x		x		
Fabaceae	<i>Senna artemisioides</i> subsp. <i>helmsii</i>		x		x			x
Fabaceae	<i>Senna artemisioides</i> subsp. <i>oligophylla</i>		x			x		x
Fabaceae	<i>Senna artemisioides</i> subsp. <i>quadrifolia</i>					x		
Fabaceae	<i>Senna glutinosa</i> subsp. <i>glutinosa</i>						x	
Fabaceae	<i>Tephrosia brachyodon</i>			x				
Fabaceae	<i>Vachellia farnesiana</i>			x				
Fabaceae	<i>Vigna lanceolata</i> subsp. <i>latifolia</i>			x				
Goodeniaceae	<i>Scaevola parvifolia</i> subsp. <i>parvifolia</i>		x			x		
Loranthaceae	<i>Amyema maidenii</i> subsp. <i>maidenii</i>		x			x	x	

Family	Taxon	Status	VT2	VT3	VT4	VT6	VT7	VT8
Malvaceae	<i>Abutilon otocarpum</i>		x	x	x	x		
Malvaceae	<i>Gossypium australe</i>		x		x	x		
Malvaceae	<i>Hibiscus ?burtonii</i>		x				x	
Malvaceae	<i>Melhania oblongifolia</i>			x				
Malvaceae	<i>Sida fibulifera</i>		x			x		x
Malvaceae	<i>Sida platycalyx</i>		x			x		
Malvaceae	<i>Waltheria indica</i>			x				
Menispermaceae	<i>Tinospora smilacina</i>		x			x	x	
Myrtaceae	<i>Corymbia aparrerinja</i>				x	x		
Myrtaceae	<i>Corymbia opaca</i>		x		x	x		
Myrtaceae	<i>Eucalyptus camaldulensis</i>			x				
Myrtaceae	<i>Eucalyptus pachyphylla</i>					x		
Myrtaceae	<i>Eucalyptus victrix</i>				x			
Myrtaceae	<i>Melaleuca glomerata</i>			x		x		
Oleaceae	<i>Jasminum calcareum</i>			x	x			x
Pittosporaceae	<i>Pittosporum angustifolium</i>				x	x		x
Plantaginaceae	<i>Stemodia viscosa</i>			x				
Poaceae	<i>Aristida contorta</i>		x					
Poaceae	<i>Aristida holathera</i>		x	x		x		
Poaceae	<i>Aristida inaequiglumis</i>		x	x	x	x		x
Poaceae	<i>Cenchrus ciliaris</i>	*		x		x		
Poaceae	<i>Digitaria brownii</i>			x				
Poaceae	<i>Enneapogon avenaceus</i>		x					x
Poaceae	<i>Enteropogon ramosus</i>		x					
Poaceae	<i>Eragrostis eriopoda</i>		x		x	x		
Poaceae	<i>Eragrostis setifolia</i>			x		x		
Poaceae	<i>Eragrostis speciosa</i>			x				

Family	Taxon	Status	VT2	VT3	VT4	VT6	VT7	VT8
Poaceae	<i>Eriachne obtusa</i>			x				
Poaceae	<i>Eulalia aurea</i>			x	x			
Poaceae	<i>Paraneurachne muelleri</i>					x		
Poaceae	Poaceae sp.		x		x	x		x
Poaceae	<i>Themeda avenacea</i>			x				
Poaceae	<i>Themeda triandra</i>			x				
Poaceae	<i>Triodia basedowii</i>						x	
Poaceae	<i>Triodia pungens</i>		x		x	x		x
Portulacaceae	<i>Calandrinia eremaea</i>					x		
Portulacaceae	<i>Portulaca oleracea</i>					x		x
Proteaceae	<i>Grevillea striata</i>				x	x		
Proteaceae	<i>Grevillea wickhamii</i>						x	
Proteaceae	<i>Hakea lorea</i>					x	x	
Proteaceae	<i>Hakea macrocarpa</i>				x	x	x	x
Rhamnaceae	<i>Ventilago viminalis</i>			x	x			
Rubiaceae	<i>Psyrax latifolia</i>		x			x		
Sapindaceae	<i>Atalaya hemiglauca</i>		x	x	x	x		
Scrophulariaceae	<i>Eremophila freelingii</i>				x	x		
Scrophulariaceae	<i>Eremophila latrobei</i> subsp. <i>glabra</i>		x		x	x		
Scrophulariaceae	<i>Eremophila longifolia</i>					x	x	
Solanaceae	<i>Solanum ellipticum</i>				x			
Solanaceae	<i>Solanum quadriloculatum</i>					x		
Surianaceae	<i>Stylobasium spathulatum</i>				x			
Violaceae	<i>Hybanthus aurantiacus</i>			x		x		

* = introduced species

Appendix D – Fauna observations

Fauna observations

Common name	Scientific name	Site (flora quadrat site)																				BST-NOVRR
		46	47	48	49	50	51	52	53	25	54	55	56	57	26	58	59	60	61	62		
MAMMALS																						
Dingo	<i>Canis lupus</i>															T						
Camel (feral)	<i>Camelus dromedarius</i>							T														
BIRDS																						
Australian Bustard*	<i>Ardeotis australis</i>																				O(1)	
Australian Ringneck	<i>Barnardius zonarius</i>							O								O						
Black-faced Cuckoo-shrike	<i>Coracina novaehollandiae</i>	O		O		O													O			
Black-faced Woodswallow	<i>Artamus cinereus</i>		O						O		O								O			
Brown Falcon	<i>Falco berigora</i>		O	O									O			O		O				
Brown Honeyeater	<i>Lichmera indistincta</i>			H	H		H												H			
Budgerigar	<i>Melopsittacus undulatus</i>														H							
Cockatiel	<i>Nymphicus hollandicus</i>	O																				
Common Bronzewing	<i>Phaps chalcoptera</i>	O																	O			
Crested Bellbird	<i>Oreoica gutturalis</i>		H	H	H	H	H	H	H		H	H	H	H	H	H	H	H	H	H		
Crested Pigeon	<i>Ocyphaps lophotes</i>							O														
Diamond Dove	<i>Geopelia cuneata</i>			O		O		O				O				O						
Galah	<i>Eulophus roseicapilla</i>	O														O						
Grey Butcherbird	<i>Cracticus torquatus</i>																	H				
Grey Shrike-thrush	<i>Colluricincla harmonica</i>		H				H		H			H					H			H		
Grey-crowned Babbler	<i>Pomatostomus temporalis</i>				O											O						
Grey-headed Honeyeater	<i>Lichenostomus keartlandi</i>		O					O			O	O		O	O	O			O			
Horsfield's Bronze-cuckoo	<i>Chalcites basalus</i>																H					
Inland Thornbill	<i>Acanthiza apicalis</i>				O		O															
Little Woodswallow	<i>Artamus minor</i>											O				O			O			

Common name	Scientific name	Site (flora quadrat site)																				BST-NOVRR
		46	47	48	49	50	51	52	53	25	54	55	56	57	26	58	59	60	61	62		
Magpie-lark	<i>Grallina cyanoleuca</i>	O		O											O							
Mistletoebird	<i>Dicaeum hirundinaceum</i>		H	H	H			H								H			H			
Pallid Cuckoo	<i>Cacomantis pallidus</i>																				O	
Peaceful Dove	<i>Geopelia striata</i>	O																				
Pied Butcherbird	<i>Cracticus nigrogularis</i>												H									
Rainbow Bee-eater	<i>Merops ornatus</i>			O								O										
Red-backed Kingfisher	<i>Todiramphus pyrrhopygius</i>															O						
Red-browed Pardalote	<i>Pardalotus rubricatus</i>		H	H		H		H														
Red-capped Robin	<i>Petroica goodenovii</i>	O																				
Rufous Songlark	<i>Cincloramphus mathewsi</i>															O	O					
Rufous Whistler	<i>Pachycephala rufiventris</i>	H	H	H	H	H	H	H	H	H	H	H	H		H	H	H	H	H	H		
Sacred Kingfisher	<i>Todiramphus sanctus</i>	O				O										O						
Singing Honeyeater	<i>Lichenostomus virescens</i>											H	H				H	H	H			
Spiny-cheeked Honeyeater	<i>Acanthagenys rufogularis</i>	H		H	H	H	H	H						H		H		H	H			
Torresian Crow	<i>Corvus orru</i>	H																				
Variegated Fairy-wren	<i>Malurus lamberti</i>				O	O	O															
Weebill	<i>Smicromnis brevirostris</i>							H												H		
Western Gerygone	<i>Gerygone fusca</i>											H		H	H	H	H					
Whistling Kite	<i>Haliastur spheonurus</i>	S																				
White-plumed Honeyeater	<i>Lichenostomus penicillatus</i>	H		H		H										H						
White-winged Fairy-wren	<i>Malurus leucopterus</i>											O	O			O						
White-winged Triller	<i>Lalage sueurii</i>		O						O							O		O				
Willie Wagtail	<i>Rhipidura leucophrys</i>	O							O				O	O					O	O		
Yellow-rumped Thornbill	<i>Acanthiza chrysorrhoa</i>				O																	
Yellow-throated Miner	<i>Manorina flavigula</i>														O	O						

Common name	Scientific name	Site (flora quadrat site)																			BST-NOVRR
		46	47	48	49	50	51	52	53	25	54	55	56	57	26	58	59	60	61	62	
Zebra Finch	<i>Taeniopygia guttata</i>	O		O												O			O		
REPTILES																					
Fire-tailed Skink	<i>Morethia ruficauda</i>					O															
Great Desert Skink	<i>Liopholis kintorei</i>																				O(1)**
Greer's Ctenotus	<i>Ctenotus greeri</i>				O																
Long-nosed Dragon	<i>Gowidon longirostris</i>						O					O									
Spiny-tailed Monitor	<i>Varanus acanthurus</i>																O				

* - Threatened species; O – Observed; H – Heard; T – tracks; ** - reported in GHD (2017).

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