



NEWCREST MINING LIMITED
TELFER GOLD MINE
30 July 2007

**Southern Waste Dump Extension and Addition of Topsoil
Stockpiles in Tenements M45/6 and M45/208:**

**Addendum to Notice of Intent (NOI) 4070 Telfer Project Mine
and Borefield Extensions, August 2002**

Proposal Overview: Newcrest Mining Limited (NML) is seeking approval to amend NOI 4070 (dated August 2002 and retained on DoIR file No. 5355/02), with the proposed extension of the Southern Waste Dump and topsoil stockpile areas (Newcrest, 2002a). This extension would encompass some 143 hectares, over two tenements, M45/6 and M45/208.



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1. INTRODUCTION

Newcrest Mining Limited (NML) is seeking approval to amend NOI 4070 (dated August 2002 and retained on DoIR file No. 5355/02), with the proposed extension of the Southern Waste Dump and topsoil stockpile areas (Newcrest, 2002a). Newcrest also wishes to apply for a Clearing Permit under Part V of the Environmental Protection Act (see Section 2.5). NML proposes to commence the extension once approval is granted.

2. PROPOSED DISTURBANCE

2.1 PROPOSED EXTENSION OF SOUTHERN WASTE DUMP

NML seeks approval to extend the Southern Waste Dump, to the west of Dump Leach 5 (DL5) (see Appendix 1a and 1b). The proposed extension would occupy a total area of 143 ha. It is proposed that this area be used for extension of the waste dump and topsoil stockpile as it will allow for:

- Assistance for rehabilitation of DL5 – allow for required slopes to be developed for mine closure and rehabilitation, in accordance with the *Southern Waste Dump Management Plan* (Newcrest, 2004);
- Shorter haulage distances for waste removed from the active mining areas.

2.2 PROPOSED TOPSOIL STOCKPILE

The proposed topsoil stockpile area is 25.2 ha, and will accommodate up to 500,000 m³ of topsoil, with stockpiles to be constructed no more than 2 metres high. The total area of the proposed extension of the waste dump is 117.2 ha, with a total of approximately 293,000 m³ of topsoil to be harvested. This area would also house additional topsoil harvested from within the bounds of the Southern Waste Dump extension. Topsoil would be stripped to a depth of 25 cm ahead of construction of the waste dump as per lease requirements.

Current topsoil stockpiles as per the original NOI 4070 are currently at maximum capacity, and therefore a new location is required for topsoil storage. This is due to the fact the original plan factored in progressive rehabilitation utilising freshly harvested topsoil on prepared batters. However, the ultimate batters are not yet ready for rehabilitation, necessitating the need for more topsoil stockpiles. It is proposed that this topsoil would be stored in a new location adjacent to the waste dump extension, as shown in Appendix 1a and 1b. This location is preferable as haulage distances from the extension area are kept to a minimum and the location falls outside the ultimate waste dump foot print.

2.3 DISTURBANCE AREA – MINISTERIAL STATEMENT 606

Ministerial Statement 606, issued to Newcrest Mining Limited on 1 October 2002 for the expansion of the Telfer Gold Mine (TGM), outlines the proposed disturbance the expansion will encompass. Ministerial Statement 606 states that the existing (as at 2002) mine covered some 1,800 ha, with the new disturbance planned to cover an additional 1800 ha (3600 ha total). At the present time, disturbance at Telfer covers a total of 4345 ha, which is higher than the proposed 3600 ha.



This increase is predominantly due to an improvement in the techniques used to calculate land disturbance at TGM in the past two years. Prior to 2004/2005, land disturbance was determined from a combination of sources, including old Annual Environmental Reports (AERs), some survey work and internal surface disturbance permits. During reporting for the 2004/2005 report, aerial photography was used to map disturbed areas, giving more accurate disturbance data over more tenements than previously recorded. This was further refined in the 2005/2006 AER, when satellite imagery was purchased for a greater area, and disturbance areas mapped for an additional 12 tenements. The table in Appendix 2 outlines the disturbance over the years from 2001 to 2006, including all new tenements and disturbance recorded.

The utilisation of satellite imagery and disturbance mapping of new areas has allowed for approximately 980 ha of previously unrecorded old disturbance to be identified. This disturbance is in addition to the original 1800 ha believed to be disturbed, taking the figure to approximately 2800 ha. As such, all new disturbance at Telfer to date has been within the additional 1800 ha originally provided for under Ministerial Statement 606. However, it is evident that an adjustment is required for the disturbance which occurred prior to 2002 based on these figures.

2.4 BONDING

Bonding implications of this increased area of disturbance should be considered. A break down of calculated bonds per tenement, for the proposed Southern Waste Dump extension is included in Table 1. Bonds are not applied for the creation of topsoil stockpiles (pers comm. Demelza Dravnieks). The majority of new disturbance would fall within M45/6, with a small section of Waste Dump crossing into M45/208.

2.4.1 M45/6

Based on the current bonding rates for various disturbance types from the DoIR, it has been calculated that the bond in M45/6 would require increasing by \$1,370,400 for this expansion to take place (Table 1). This should be incorporated as part of the DoIR bond review for Telfer.

2.4.2 M45/208

Based on the current bonding rates for various disturbance types from the DoIR, it has been calculated that the bond in M45/208 would require increasing by \$36,000 (Table 1). This should be incorporated as part of the DoIR bond review for Telfer.



Table 1: Calculated bonding rates for proposed extension of the Southern Waste Dump and new topsoil stockpiles for tenements M45/6 and M45/208.

Tenement	Disturbance Type	Proposed Disturbance (approximate ha)	Bond rate per ha	Total Bond
M45/6	Waste Dump	114.2	\$12,000	\$1,370,400
M45/208	Waste Dump	3	\$12,000	\$36,000
	TOTAL	149.8		\$1,406,400

*Rates are based on DoIR guidelines: Waste Dump has been classified under Rate 1, being high risk (>25 m height).

2.5 CLEARING PERMIT

A clearing permit is required for the clearing of native vegetation as described in this proposal, under Part V of the Environmental Protection Act. Newcrest seeks to obtain a Purpose Permit for this proposal, and has submitted an application for a clearing permit to the Native Vegetation Assessment Branch of the DoIR at the same time as submission of this proposal.

3. FLORA AND FAUNA

A flora and fauna survey of the proposed expansion area was conducted from the 4 to 10 July 2006 by Syrinx Environmental pl (Syrinx, 2006). The following impacts and recommendations were outlined by Syrinx (Syrinx, 2006). The report is provided as Appendix 4.

3.1 FLORA

Syrinx found that the proposed extension to the Southern Waste Dump does not ‘displace a landform or vegetation unit, species habitat, or species population’ (Syrinx, 2006). All vegetation associations surveyed in the proposed extension area are considered regionally common.

One Priority 2 Species *Goodenia* sp. Rudall River was located in the waste dump expansion area. ‘The proposed waste dump expansion will impact on the population of *Goodenia* sp. Rudall River, with 4 populations located within the study area. *Goodenia* sp. Rudall River appears to be an opportunistic species which prefers disturbed areas, with most populations found adjacent to tracks. The species is superficially similar to *Goodenia azurea*, which is a very common species around the Telfer site. It is possible that *Goodenia* sp. Rudall River is present within *Goodenia azurea* populations in other areas of the site, as mixed populations were present during this survey’ (Syrinx, 2006).



3.2 FAUNA

No significant fauna species were present during the survey. Due to the nomadic or cryptic nature of many threatened fauna species that may occur within the Telfer region, it was recommended that sites be traversed on foot prior to clearing activities to check for burrowing activities of these species (Syrinx, 2006). Telfer Environmental staff will undertake fauna inspections prior to land being cleared, to check for the presence of threatened fauna such as the Bilby and Marsupial Mole.

4. HERITAGE

Tenements M45/6 and M45/208 have previously been cleared for heritage requirements during Aboriginal cultural heritage surveys undertaken in 1975 (Hastie, 1975).

A search completed for sites on the Department of Indigenous Affairs Aboriginal Heritage Inquiry System brought up zero results for tenements M45/6 and M45/208 (Appendix 4).

5. ENVIRONMENTAL MANAGEMENT PLAN

The construction of the proposed Southern Waste Dump extension will be in compliance with *Telfer Project: Mine and Borefield Extensions – Environmental Management Plan* (Newcrest, 2002b). This document outlines the management strategies for a number of environmental aspects relevant to the extension of the waste dump including:

- Minimisation of impacts on native flora and fauna;
- Prevention of weed and pest infestations;
- Preservation and management of soil resources;
- Minimisation of dust and noise impacts;
- Control of sedimentation from disturbed areas;
- Protection of archaeological and anthropological sites/features; and
- Rehabilitation of disturbed impacts.

In addition to this, the construction of the waste dump extension will be completed in accordance with the *Southern Waste Dump Management Plan* (Newcrest, 2004).

6. REFERENCES

Hastie, J., (1975), Report on the Aboriginal Cave Paintings and Artefacts in the Telfer Region, September 1975.

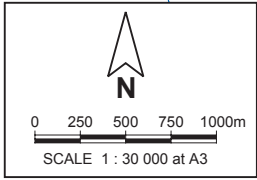
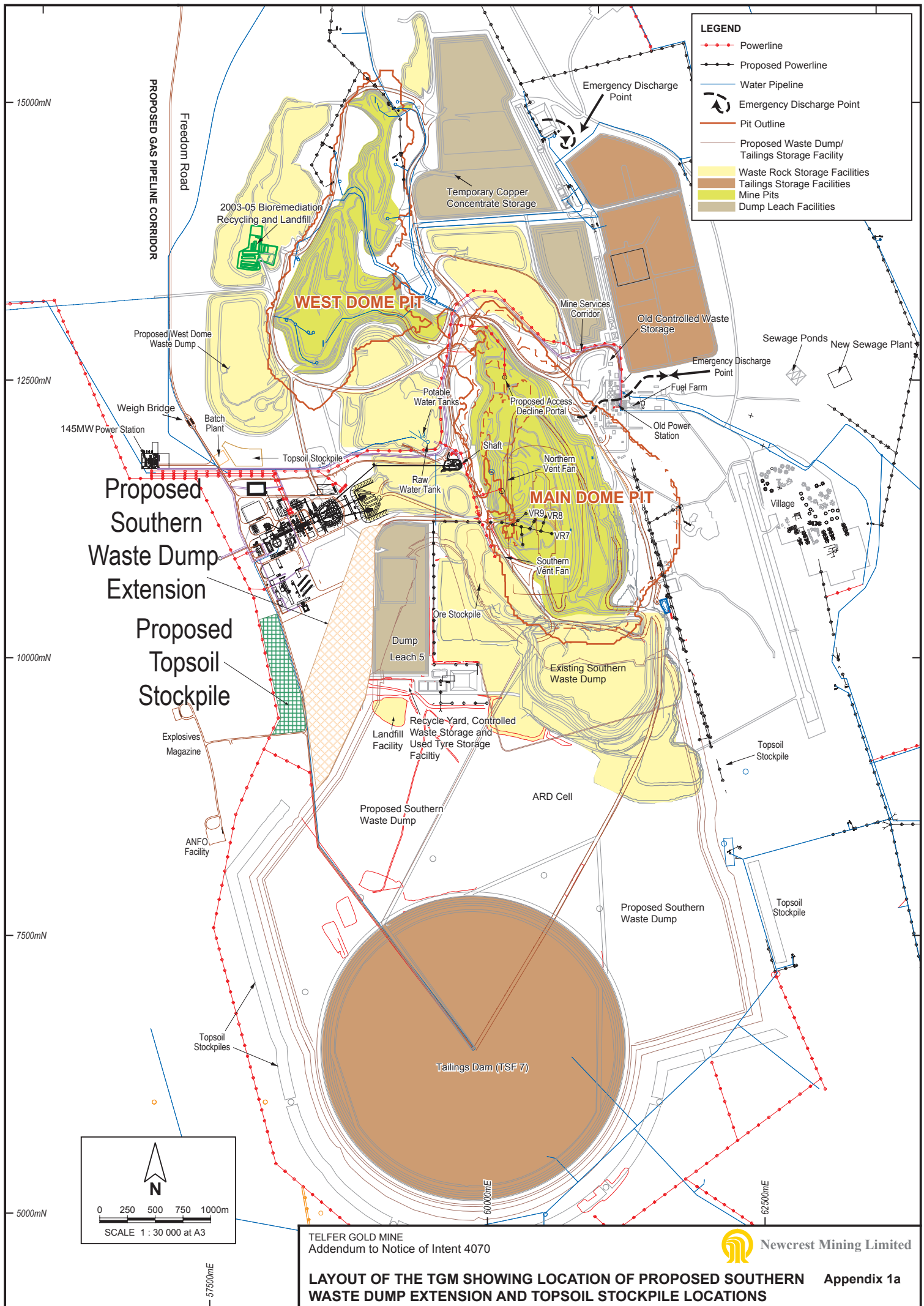
Newcrest Mining Limited (2002a), Telfer Project, Mine and Borefield Extensions Notice of Intent/Additional Referral Information, August 2002.



Newcrest Mining Limited (2002b), Telfer Project, Mine and Borefield Extensions Environmental Management Plans, August 2002.

Newcrest Mining Limited (2004), Southern Waste Dump Management Plan (TP-REP-10-MN-0014_A), April 2004.

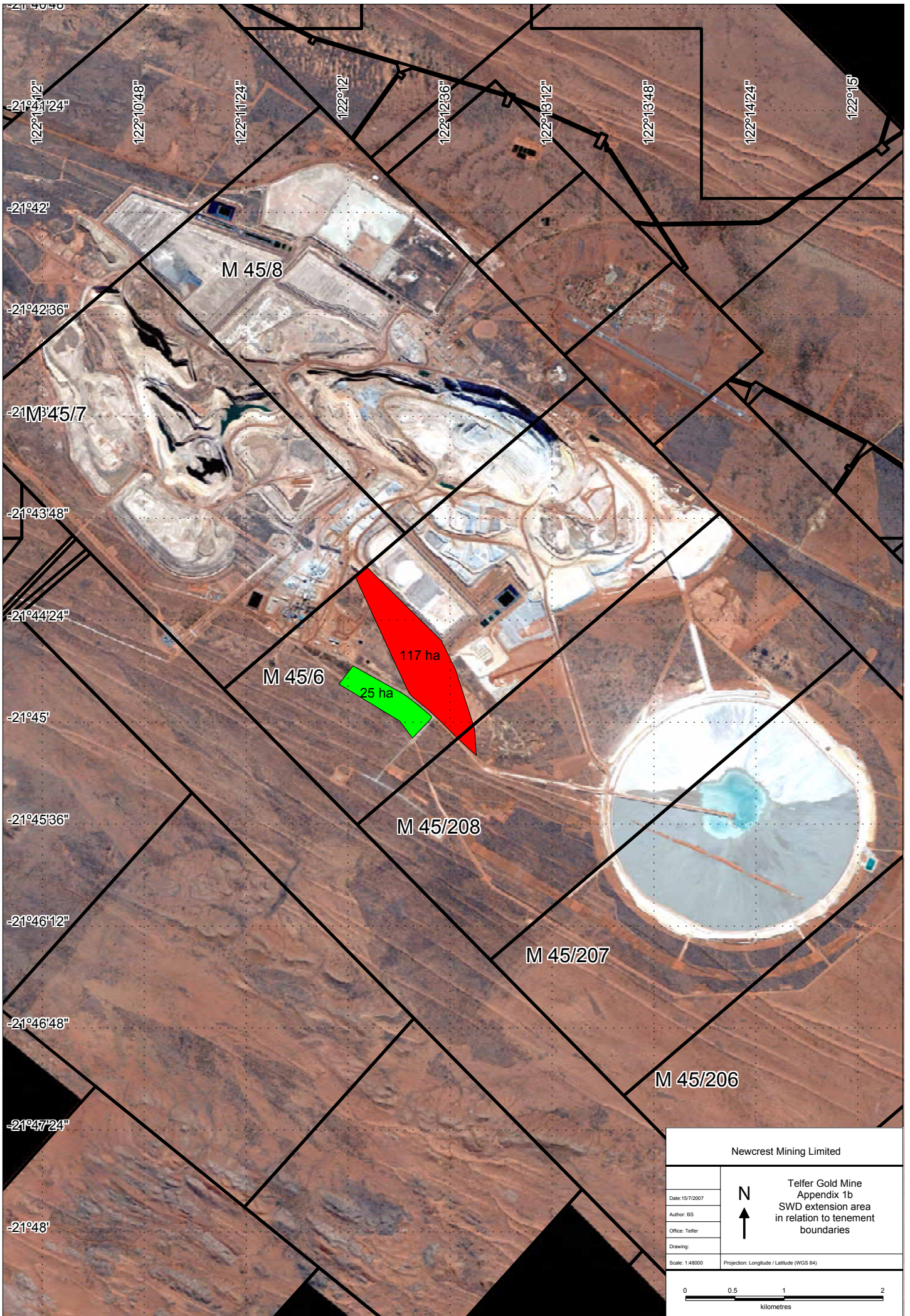
Syrinx Environmental PL (2006), Telfer Waste Dump Expansion Flora and Fauna Survey, September 2006, report prepared for Newcrest Mining Limited.



TELFER GOLD MINE
Addendum to Notice of Intent 4070



LAYOUT OF THE TGM SHOWING LOCATION OF PROPOSED SOUTHERN WASTE DUMP EXTENSION AND TOPSOIL STOCKPILE LOCATIONS Appendix 1a



-21°40'40"
 -21°41'12"
 -21°41'24"
 -21°42'
 -21°42'36"
 -21°43'12"
 -21°43'36"
 -21°44'00"
 -21°44'24"
 -21°45'
 -21°45'36"
 -21°46'12"
 -21°46'48"
 -21°47'24"
 -21°48'

122°10'48"
 122°11'24"
 122°12'
 122°12'36"
 122°13'12"
 122°13'48"
 122°14'24"
 122°15'

M 45/8

M 45/7

M 45/6

M 45/208

M 45/207

M 45/206

117 ha

25 ha

Newcrest Mining Limited	
Date: 15/7/2007 Author: BS Office: Telfer Drawing: Scale: 1:48000	<div style="text-align: center;"> <p>N</p> </div> <p style="text-align: center;"> Telfer Gold Mine Appendix 1b SWD extension area in relation to tenement boundaries </p> <p style="text-align: center; font-size: small;">Projection: Longitude / Latitude (WGS 84)</p> <div style="text-align: center;"> <p>0 0.5 1 2 kilometres</p> </div>

ATTACHMENT 2: Disturbance per tenement from 2001 to 2006.

Tenement	Disturbance 2001/2002	Disturbance 2002/2003	Disturbance 2003/2004	Disturbance 2004/2005	Disturbance 2005/2006	Increase in old disturbance recorded (03/04 to 05/06)
M45/6	365.4	469.3	549.7	633.1	674.47	
M45/7	425.4	490.5	491.5	794.9	796.48	303.4
M45/8	724.7	727.5	727.5	905.1	901.67	177.6
M45/33	134.6	144.7	144.7	201.3	203.5	56.6
M45/208	21.3	169.2	218.1	434.8	470.91	NA
M45/11	52.6	52.6	52.6	57.6	46.69	NA
M45/9	3.7	47.7	53.7	72.2	77.67	18.5
G45/1	4.4	4.4	4.4	25.3	31.5	20.9
G45/2	61.1	65.1	67.1	104.6	112.3	45.2
G45/3	31.4	44.8	44.8	122.2	122.11	77.4
M45/205	nil	6.8	6.8	6.8	11.3	4.5
M45/206	nil	21.6	21.6	21.6	46.78	NA
M45/207	nil	109.1	218.1	566.3	567.1	NA
M45/249	nil	5.6	5.6	5.6	17.03	11.43
L45/100	nil	nil	1.5	1.5	12.97	11.47
L45/106	nil	nil	nil	80.6	105.51	105.51
M45/210	nil	nil	nil	3.75	19.4	19.4
G45/04	nil	nil	nil	nil	3.45	3.45
L45/99	nil	nil	nil	nil	2.1	2.1
M45/10	nil	nil	nil	nil	14.96	14.96
M45/203	nil	nil	nil	nil	12.26	12.26
M45/204	nil	nil	nil	nil	4.49	4.49
M45/209	nil	nil	nil	nil	23.64	23.64
M45/211	nil	nil	nil	nil	41.42	41.42
M45/631	nil	nil	nil	nil	6.95	6.95
M45/632	nil	nil	nil	nil	0.24	0.24
M45/633	nil	nil	nil	nil	1.32	1.32
M45/709	nil	nil	nil	nil	12.29	12.29
M45/710	nil	nil	nil	nil	4.81	4.81
TOTAL	1824.6	2358.9	2607.7	4037.25	4345.32	979.84

nil - no disturbance recorded during this reporting period.

NA - not applicable.

Old disturbance recorded as a result of improved disturbance mapping techniques

TECHNICAL REPORT

**TELFER WASTE DUMP EXPANSION
FLORA AND FAUNA SURVEY**

SEPTEMBER 2006

**FOR
NEWCREST MINING LTD**

syrinx environmental pl
restoration remediation research operations



masterplanning landscape architecture design

SYRINX ENVIRONMENTAL PL
REPORT NO. RPT- 0406 - 005

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EXECUTIVE SUMMARY

Newcrest Mining Pty Ltd is proposing to extend several waste dumps in the Great Sandy Desert at the Telfer Gold Mine, approximately 400km east of Port Hedland. The extension of the waste dumps is required to allow for future growth of the Mine. This report presents the results of a flora and fauna survey undertaken in a portion of the proposed extension area.

The vegetation of the expansion area is dominated by Spinifex (*Triodia* spp) with shrub and tree species present differentiating the vegetation communities. Six vegetation types were identified and mapped. All vegetation types are regionally common, although an unusual plant assemblage was found on the top of sand dunes near the southern boundary of the study area.

The Priority 2 species *Goodenia* sp. Rudall River was found at four locations south of the existing waste dumps, with a total population of approximately 200 plants.

It is recommended an additional survey is undertaken to gain a more regional perspective of the distribution of *Goodenia* sp. Rudall River around the Telfer region to provide a better understanding of the conservation status of the species in terms of the proposal to extend the waste dumps.

No Priority fauna was located during the survey. Evidence of old Greater Bilby diggings were found within the *Acacia stipuligera* Shrubland area suggesting the suitability of this vegetation type for Greater Bilby habitat.

It is also recommended the sand dunes at the southern extent of the waste dump expansion area are to be avoided due to their value for fauna habitat and the presence of an unusual assemblage of plants on the dune crests.

1.0 INTRODUCTION

Newcrest Mining Pty Ltd is proposing to extend several waste dumps at the Telfer Gold Mine, approximately 400km east of Port Hedland. The waste dump expansion is required to allow for future growth of the site. The total proposed expansion area is 1293ha, which includes areas of existing infrastructure, such as settling ponds. A portion of that area has been surveyed previously by Hart, Simpson and Associates (2002) as part of an ecological survey.

Newcrest Mining Pty Ltd engaged Syrinx Environmental PL to undertake an Ecological Survey of the remaining 510ha vegetated portion of the proposed waste dump extension, which was not part of the Hart, Simpson and Associates (2002) survey, in order to assess the likely environmental impacts of the proposal on flora and fauna.

1.1 SCOPE OF WORK

The scope of work covered in this assessment was as follows:

1. Vegetation and Flora Survey. All areas proposed for the waste dump extension (excluding the area already surveyed by Hart, Simpson and Associates, 2002) have been surveyed to determine vegetation communities. A search for any DRF or Priority Flora potentially present, including a location identified previously by Hart Simpson and Associates as a location of a *Goodenia hartiana* ms (recently renamed *Goodenia* sp. Rudall River) population, was undertaken.
2. Fauna Survey. A survey was undertaken for any vertebrate species present, with an emphasis placed on identifying and describing evidence of bilby, mulgara and marsupial mole activity (i.e. burrows, tracks or scats).

1.2 CLIMATE

An important factor with surveying flora and fauna in the Great Sandy Desert is the impact of climate, as many of the herbaceous plant species are predominantly ephemeral. The rainfall of the three summers prior to this survey had been erratic, ranging from the summer floods in 2004 of Cyclone Fay followed by a summer of below average rainfall in 2005. Average rainfall was recorded in the summer prior to this survey, although the previous two months recorded below average rainfall (Figure 1).

The data for Figure 1 is from Bureau of Meteorology Station 13030 (Telfer).

TELFER WASTE DUMP EXPANSION
FLORA AND FAUNA SURVEY

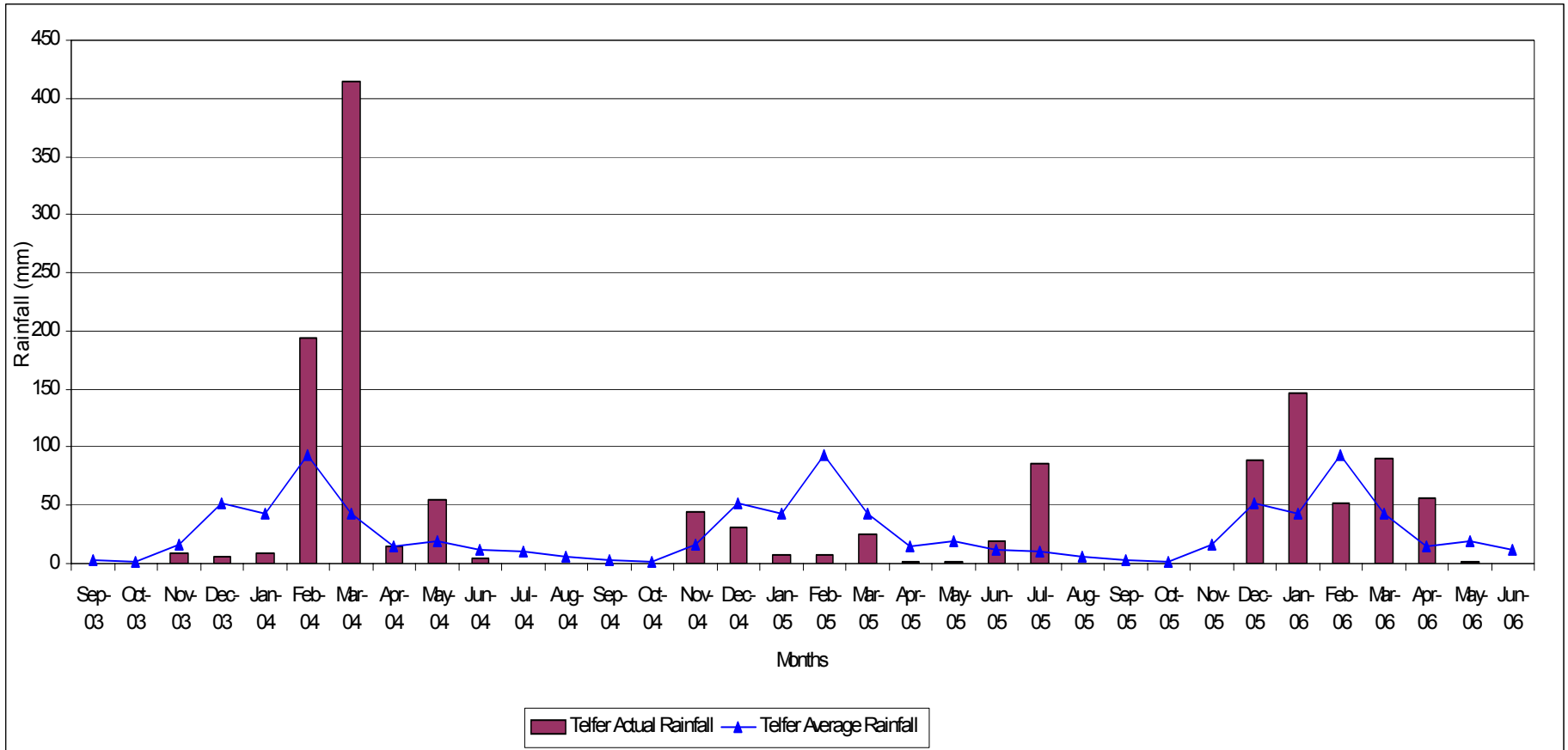


Figure 1 Actual and average rainfall recorded at Telfer between September 2003 and June 2006 (Bureau of Meteorology 2006)

2.0 METHODS

The approach taken for this survey was as follows:

1. Desktop review of the existing literature from previous reports and DEC (formerly CALM), records of DRF, priority flora and fauna, and threatened ecological community locations;
2. Field survey undertaken over 5 days from July 4th to 10th 2006.

2.1.1 Desktop Review

The desktop review examined the following reference material:

Ecologia (2003) Telfer Project-Power Supply and Infrastructure Corridor Rare and Priority Fauna and Flora Survey. Report Prepared for Newcrest Mining Limited.

Hart, Simpson and Associates Pty Ltd (1997) Telfer Minesite. Topsoil Areas Flora and Vegetation. Report Prepared for Newcrest Mining Limited.

Hart, Simpson and Associates Pty Ltd (2000) Telfer Satellite Pits, Access and Water Release Area. Ecological Survey. Report Prepared for Newcrest Mining Limited.

Hart, Simpson and Associates Pty Ltd (2002) Telfer Project Ecological Survey. Report Prepared for Newcrest Mining Limited.

These reports, plus a search of the Declared Rare and Priority Flora (DEC 2006) were used to compile a list of all potential Declared Rare and Priority Flora of the area, which are listed in Appendix 3.

A number of resources were used to determine potential fauna abundance on site. These included publications providing information on general patterns of distribution of frogs (Tyler et al. 2000), reptiles (Storr et al. 1983, 1990, 1999 and 2002; Wilson and Swan 2004), birds (Barrett et al. 2003; Storr, 1981) and mammals (Churchill 1998; Menkhorst and Knight 2001; Strahan 1995). Birds Australia's Atlas database was searched for the area 21° to 22° S and 122° to 123° E. Reports from previous fauna studies undertaken in the area were also utilised (Burbidge and McKenzie, 1983; Hart, Simpson and Associates, 1999 and 2000; Read, 1998).

These sources of information were used to create lists of fauna species expected to occur at the study site. As far as possible, expected species are those that are likely to utilise the study area, and such lists exclude species that have been recorded in the general region as vagrants or for which suitable habitat is absent.

2.2 VEGETATION SURVEY

2.2.1 Level of Assessment

The Telfer area lies within the Bioregion Group 4 (EPA 2004b). The scale and nature of impact of the proposal is considered high as it is >75ha, therefore this survey is classified as a Level 2 Survey under Guidance Statement No. 51 (EPA, 2004b).

2.2.2 Vegetation Survey

Fieldwork was undertaken between the 4th and 10th of July 2006. The flora survey work was undertaken by Sandra Santich. Arthur Weston assisted with identifications of flora post-fieldwork.

The survey method included the set-up of quadrats (50 x 50m) in each vegetation unit, which is the standard size quadrat currently used by DEC (Greg Keighery, pers comm.) for biodiversity surveys in the Pilbara.

Opportunistic collections were also made to ensure all species were collected. Particular attention was made in the field to identify any of the DRF or Priority Flora listed in Appendix 3.

The location of plots (north-west corner of each plot) and populations of any significant flora were recorded using GPS. The projection was AMG Zone 51 (AGD 84) to ensure consistency with the projection used by Newcrest Mining Ltd on the Telfer site.

Upon collection, specimens were identified using a field herbarium created from specimens recently collected and identified in the area (verified at the WA Herbarium, Perth), and by comparing them with specimens in the Telfer and WA Herbarium. Most specimens were identified to species level, with ambiguous specimens identified to the genus level.

Confirmation of all species was made by Arthur Weston at the Western Australian Herbarium. Determination of species was also made by the following Western Australian Herbarium staff: Leigh Sage, Paul Wilson and Rob Davis. Flora voucher specimens of all species collected will be submitted to the Western Australian Herbarium.

2.2.3 Limitations of Methods

As there was only one survey effort, not all species would have been collected. Due to the lack of rain in the two months previous to sampling some ephemeral species had very little vegetative material remaining.

2.3 FAUNA SURVEY

2.3.1 Level of Assessment

The Telfer area lies on the boundary of the Great Sandy Desert and Little Sandy Desert biogeographical regions (discussed in detail below). Both of these sites fall within the Group 4 Bioregions as described in the EPA's Guidance Statement No.56 (EPA, 2004a). As such, this

report and survey are classified as a Level 1 Survey under the Guidance Statement No. 56 (EPA, 2004a). It is recommended under these guidelines that surveys include both a desktop study and a reconnaissance survey.

An extended reconnaissance survey was conducted from the 4th – 10th July 2006. Work carried out in the field included the following:

- Limited systematic trapping for reptiles and mammals;
- Spotlighting for nocturnal reptiles, birds and mammals;
- The use of ultra-sonic detector for bats;
- Hand searching for reptiles; and
- Opportunistic sightings of birds and other animals.

2.3.2 Fauna Survey

The fauna survey was undertaken by Brenden Metcalf. The fauna component of the field survey was conducted under DEC Regulation 17 licence number SF005467.

Taxonomy and nomenclature for fauna species used in this report generally follow publications made by the WA Museum (2001) for amphibians, reptiles and mammals, and Christidis and Boles (1994) for birds.

2.3.2.1 Trapping

Elliot traps were used to trap for reptiles and mammals at three locations within the study area. It should be noted that trapping effort was not distributed representatively over the site, e.g. no trapping took place in Vegetation Type 1 (see Section 3.2 for descriptions of Vegetation Types).

- Vegetation Type 2 (32 trap/night)
- Vegetation Types 3, 4, and 5 (32 trap/night);
- Vegetation Types 4, 5 and 6 (16 trap/night).

Each trap was baited with universal bait (rolled oats, peanut butter and sardines).

2.3.2.2 Spotlighting

Spotlighting took place on two nights of the study and was carried out either on foot using head-torches (referred to as head-torching) or from a vehicle using the vehicle headlights and a hand-held spotlight. On all occasions, spotlighting began after sunset, when it was fully dark, and animals seen were counted, identified and, if necessary for identification, captured. Bats were surveyed through the use of an Anabat II Ultrasonic Detector when spotlighted.

2.3.2.3 Searching for Reptiles/Mammals

Searches for reptiles and mammals was carried out throughout the study area and involved raking through leaf-litter, breaking into dead trees, looking under bark and turning over rocks, logs and dead Spinifex.

2.3.2.4 Opportunistic Survey

At all times, observations of fauna were noted when they contributed to the accumulation of information to the site. These included casual observations of birds or reptiles seen while travelling between sites or to and from camp.

3.0 RESULTS

3.1 REGIONAL AND LOCAL CONTEXT

The regional and local context was previously described by Syrinx Environmental PL, Vegetation and Fauna (2004). To reiterate the significance of the location, the site lies within the Great Sandy Desert Region and within the Canning Botanical District (Beard 1974). The Telfer Mine is surrounded by dunes and vegetation is mapped as mixed shrub steppe between sand hills. The mapping was at a scale of 1:1,000,000 by Beard (1974).

Geologically the area is sandplain overlying lateritic sandstones and conglomerates, which are exposed locally. The general area is characterised by gently undulating plains dominated by longitudinal sub-parallel sand ridges known as seif dunes, aligned predominantly WNW-ESE conforming to the prevailing wind patterns. They are thought to have been formed during the last ice age approximately 15 000 years ago (Beard 1990).

The site lies on the boundary of two bio-geographical regions, the Mackay subregion of the Great Sandy Desert and the Trainor subregion of the Little Sandy Desert. These regions are described by Kendrick (2001), and Cowan and Kendrick (2001) respectively:

Great Sandy Desert – Mackay subregion (GSD2)

“Tropical inland 'red-centre' desert includes 'Percival' and 'Auld' palaeoriver systems. Mainly tree steppe grading to shrub steppe in the south; comprising open hummock grassland of *Triodia pungens* and *Triodia schinzii* with scattered trees of *Owenia reticulata* and bloodwood (*Corymbia* spp.), and shrubs of *Acacia* spp., *Grevillea wickhamii* and *G. refracta*, on Quaternary red longitudinal sand dune fields overlying Jurassic and Cretaceous sandstones of the Canning and Armadeus Basins. *Casuarina decaisneana* (Desert Oak) occurs in the south and east of the region. Gently undulating lateritised uplands support shrub steppe such as *Acacia pachycarpa* shrublands over *Triodia pungens* hummock grass. Calcrete and evaporite surfaces are associated with occluded palaeo-drainage systems that traverse the desert; these include extensive salt lake chains with samphire low shrublands, and *Melaleuca glomerata* - *M. lasiandra* shrublands. Monsoonal influences are apparent in the north western sector of this region. The climate is arid tropical with summer rainfall. Subregional area is 18, 636, 695 ha” (Kendrick, 2001).”

Note: The name *Casuarina decaisneana* is no longer current; the current name is *Allocasuarina decaisneana*.

Little Sandy Desert – Trainor subregion (LSD2)

“The Trainor subregion is red centre desert on Neoproterozoic sedimentary basement (Officer Basin). Red Quaternary dune fields with abrupt Proterozoic sandstone ranges of Bangemall Basin. Shrub steppe of *Acacia* species, *Aluta maisonneuvei* and *Grevillea* species over *Triodia schinzii* on sandy surfaces. Sparse shrub-steppe over *Triodia basedowii* on stony hills, with Eucalypt and Coolibah communities and bunch grasslands on alluvial deposits and drainage lines associated with ranges. The climate is arid with episodic summer rainfall. The subregional area is 11,114,705ha in size (Cowan and Kendrick, 2001).”

The surveyed area was predominantly red sands or clay sands, with occasional abundant loose laterite stones and stony hills (as described in Hart, Simpson and Associates, 2001).

Vegetation of the dune ridges in this region is considered simple in species and structure and is extremely consistent. Dune slopes are similarly homogeneous, varying at a large scale due to differences in rainfall and temperature patterns (defined principally by the 22° latitude line). The depth of sand, presence of stony ground, fire history and presence of clay primarily influence the vegetation of the interdune swales.

Locations of the proposed waste dump expansion and vegetation types are shown in Figure 8.

3.2 VEGETATION AND FLORA

A total of 104 taxa were recorded during this survey. When combined with the Hart, Simpson and Associates (2002) data the combined number of taxa found within the entire waste dump expansion area is 277 taxa (see Appendix 1). The only Priority Flora species recorded was *Goodenia* sp Rudall River. Descriptions of the *Goodenia* sp Rudall River populations are provided in Section 3.2.4.

The vegetation survey identified three broad landform units during the survey. These were:

- Sandplain (Dune Swales) (3 vegetation types),
- Rocky Outcrop (2 vegetation types),
- Dune Crest and Slope (1 vegetation type).

These landform units are common regionally in the eastern Pilbara and Great Sandy Desert generally. The vegetation types present were closely related to the landform types. The distribution of the vegetation types are shown in Figure 8 and described below.

All vegetation types are common regionally, although an unusual plant assemblage was recorded on the dune crest.

3.2.1 Sandplain Vegetation Types

Similar to Hart, Simpson and Associates (2002) the dominant vegetation type is the sandplain vegetation type dominated by *Triodia basedowii* with the overstorey changing in type and dominance depending on the soils present. The vegetation types recorded were also compared with those recorded by Hart and Associates (2002) in the remainder of the waste dump expansion area.

Vegetation Type 1: Mixed Acacias over *Triodia basedowii*

Hart, Simpson and Associates (2002) vegetation type: Sandplain (Variation 1)

Vegetation Condition: Excellent to Good. This vegetation type was the most common through the study area and is very common regionally in swales between dunes.

A portion of this study site is rehabilitation of a previous gravel pit. In these areas *Acacia ancistrocarpa* is the dominant species. Other common species in the rehabilitated area include *Goodenia azurea* ssp. *hesperia*, *Grevillea wickhamii* and *Aristida holathera* var. *holathera*. Other *Acacia* species present throughout this vegetation type included *Acacia stellaticeps*, *A. pyrifolia*, *A. stipuligera*, *A. ligulata*, *A. tumida* var. *pilbarensis* and *A. adoxa* var. *adoxo*.

The weed species Buffel Grass (*Cenchrus ciliaris*) was found in this area, reflecting the close proximity of this area of the vegetation type to the mine village and other mine infrastructure such as workshops, where the weed species is present.

The area east of the Telfer village had been affected by a recent fire. Several species were abundant in the fire affected area but not present in the remaining study area, including *Velleia connata* and *Gonocarpus eremophilus*.

The vegetation condition was good in areas of localised disturbance through gravel removal, whilst the remainder was in excellent condition.



Figure 2 Mixed Acacias over *Triodia basedowii* in rehabilitated areas

Vegetation Type 2: *Corymbia opaca* and *Hakea lorea* over *Triodia basedowii*

Hart, Simpson and Associates (2002) vegetation type: Sandplain (Variation 5)

Vegetation Condition: Excellent

This vegetation type only occurred north of the minesite, between the waste dumps and the airport runway. The overstorey species varied with other species present, including *Corymbia opaca*, and *G. eriostachya* and *G. stenobotrya* (Figure 3).

Common understorey species included *Jacksonia aculeata*, *Ptilotus polystachyus*, *Dampiera candicans*, *Newcastelia cladotricha*, *Dicrastylis georgei* and *Goodenia azurea* subsp. *hesperia*.

This area was sandplain but contained more gravel compared to the adjacent mixed *Acacia* Shrubland. These areas had a similar lower stratum as the mixed *Acacia* over *Triodia basedowii* vegetation type, with species such as *Ptilotus polystachyus* and *Newcastelia cladotricha* common to both vegetation types.



Figure 3 *Corymbia opaca* and *Hakea lorea* over *Triodia basedowii*

Vegetation Type 3: *Acacia stellaticeps* over *Triodia basedowii*

Hart, Simpson and Associates (2002) vegetation type: Sandplain with gravel

Vegetation Condition: Excellent

This vegetation type was found at the base of the rocky slopes within the southern portion of the study area. The substrate was sandy with occasional rocky areas. Overall vegetation cover was low compared to the other sandplain vegetation types. *Triodia basedowii* was the dominant species present with the occasional dense areas of mainly *Acacia stellaticeps*. Other occasional species included *Acacia aluta*, *Ptilotus polystachyus* and *Goodenia stobbsiana*. *Eucalyptus leucophloia* subsp. *leucophloia* and *Corymbia opaca* were very occasionally present. The following species were recorded only in this vegetation type: *Fimbristylis dichotoma*, *Schizachyrium fragile* and *Heliotropium glanduliferum*.

Two *Goodenia* sp. Rudall River plants were found in this vegetation type in an area previously identified as a Priority Flora Reserve by Hart, Simpson and Associates (2002).



Figure 4 *Acacia stellaticeps* over *Triodia basedowii*

Vegetation Type 4: *Acacia stipuligera* Shrubland

Hart, Simpson and Associates (2002) vegetation type: Sandplain (Variation 2)

Vegetation Condition: Excellent

This vegetation type was restricted to the southern portion of the site in low lying areas which would be seasonally wet during summer. The vegetation cover in places was almost 100% *Acacia stipuligera*. Understorey species in these areas were usually only *Triodia basedowii* and *Jacksonia aculeata*. In areas where the canopy was more open other species were present, including *Mirbelia viminalis* and *Scaevola parviflora* subsp. *pilbarea*

Eucalyptus pachyphylla and *E. odontocarpa* were present only in this vegetation type and in areas of dense *Acacia stipuligera* close to the base of the existing waste dumps.

Three populations of *Goodenia* sp. Rudall River were found in this vegetation type (see Section 3.2.4).

Any changes in hydrology or drainage as a result of the expansion would impact on this vegetation type within the study area, as it is dependent on being seasonally wet.



Figure 5 *Acacia stipuligera* Shrubland

3.2.2 Rocky Outcrop Vegetation Type

Vegetation Type 5: *Triodia schinzii* grassland on stony hills

Hart, Simpson and Associates (2002) vegetation type: Stony Hills

Vegetation Condition: Excellent

This vegetation type is present on the southern side of the minesite on a line of stony hills immediately south of the existing waste dumps. Although the appearance is very similar to adjacent vegetation types, the change from *Triodia basedowii*, common on the sandplain, to *Triodia schinzii* is apparent.



Figure 6 *Triodia schinzii* grassland on stony hills

The scattered shrubs also change from the surrounding sandplain areas, with the following species only found on the rocky outcrops: *Eremophila latrobei* subsp. *latrobei*, *Senna sericea*, *Eremophila forrestii*, *Goodenia triodiophylla*, *Maireana tomentosa* and *Oldenlandia crouchiana*.

This vegetation type is common on rocky outcrops regionally.

3.2.3 Sand Dune Vegetation Type

Vegetation Type 6: Mixed shrubs on dunes

Hart, Simpson and Associates (2002) vegetation type: Sand Dunes

Vegetation Condition: Excellent

The sand dune was present on the southern extent of the proposed waste dump extension. Typical species compositions for dunes in the regional area were present, including *Grevillea stenobotrya*, *Triodia schinzii* and *Dicrastyliis dorianii* (Figure 7).

Some areas of the dunes were locally dominated by *Aluta maisonneuvei* on the crest, which is an unusual association and in our experience uncommon regionally. This species is usually only found at the base of dune slopes.



Figure 7 Mixed shrubs on dunes

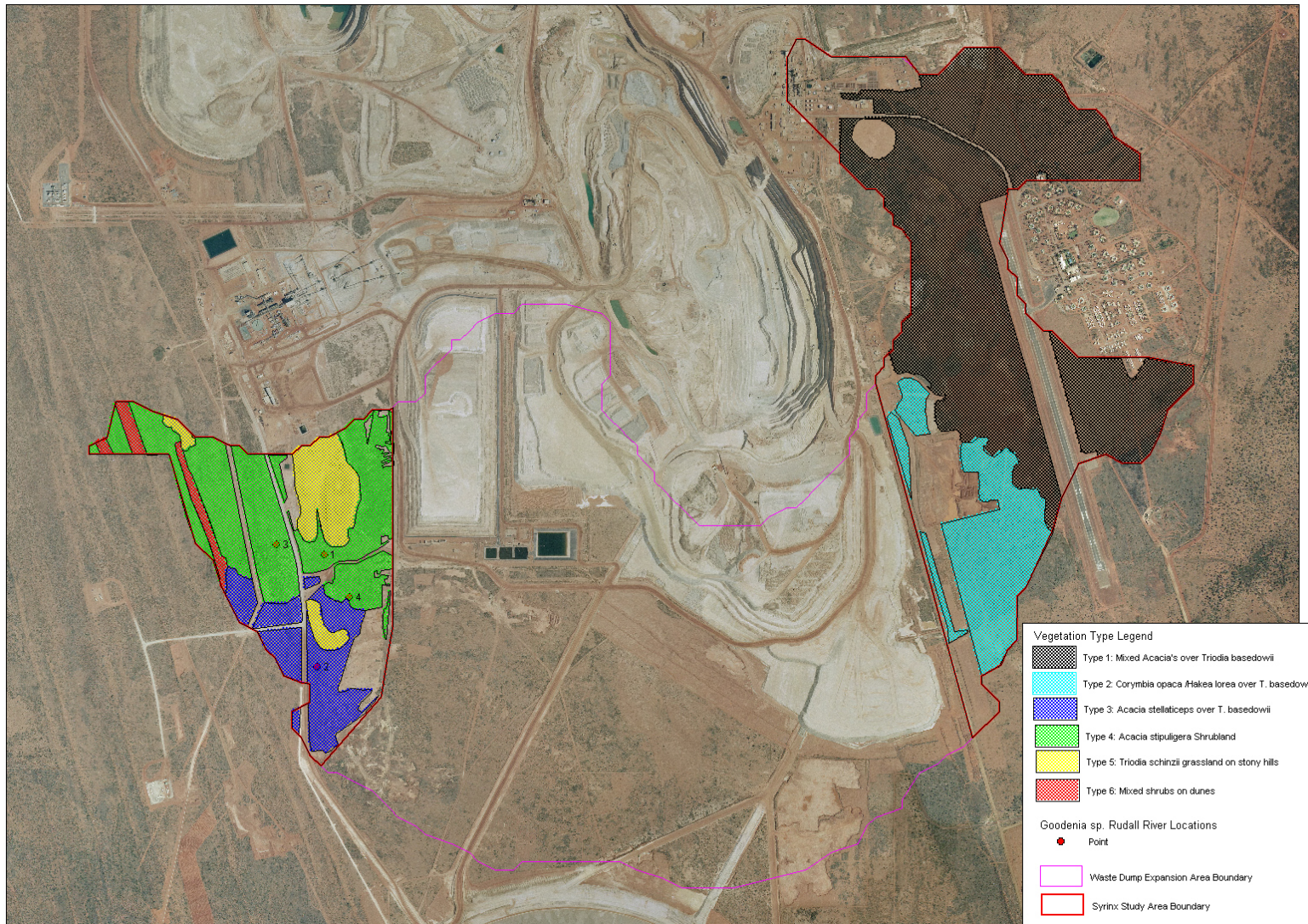


Figure 8 Vegetation Map

3.2.4 Significant Flora

Goodenia sp Rudall River (RP Hart 972) (previously known as *Goodenia hartiana*) was located at 4 locations within the surveyed area. The location and population size are listed in Table 1. Photos of each population are shown in Figure 9 to 12.

All populations were located south of the existing waste dumps (see Figure 8). The superficially similar species *Goodenia azurea* subsp. *hesperia* species was common throughout the entire study area.

Table 1 *Goodenia* sp. Rudall River populations

Population Number	Population Size	GPS Location	Notes
1	~ 50 mature plants	0417 960, 7595060	Between rocky slope and track.
2	2	0418 362, 7594566	Within Priority Flora Area under dense <i>Acacia stipuligera</i>
3	20 mature plants	0417 722, 7594915	In low-lying wetland area adjacent to road.
4	~ 50 mature (similar number of seedlings)	0418 227, 7594977	Population approx. 40m in diameter (high density). Clear area within <i>Acacia stipuligera</i> Shrubland.



Figure 9 *Goodenia* sp. Rudall River Population 1

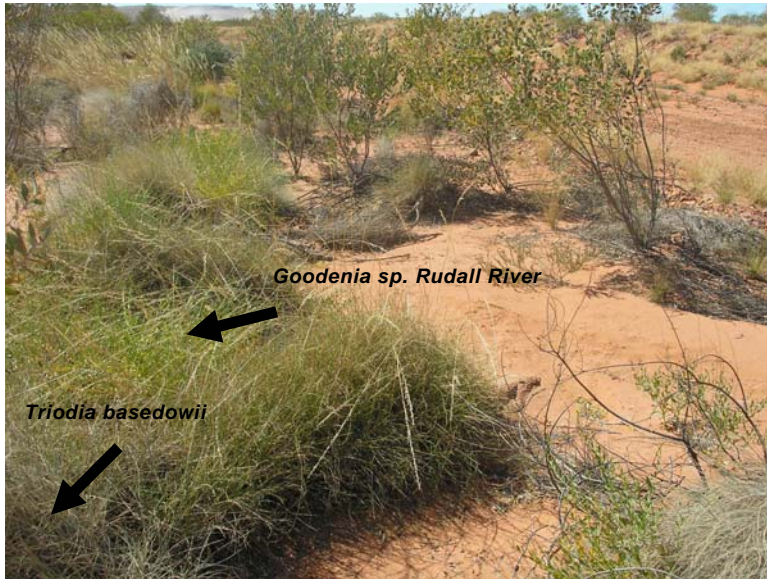


Figure 10 *Goodenia* sp. Rudall River Population 2 amongst *Triodia basedowii*



Figure 11 *Goodenia* sp. Rudall River Population 3



Figure 12 *Goodenia* sp. Rudall River Population 4

3.3 VERTEBRATE FAUNA

On the basis of known species distributions and habitats available, there are 233 species of vertebrate fauna that may be expected to occur in the proposed waste dump expansion area with 48 recorded during the July 2006 assessment. This includes eight frogs, 94 reptiles, 99 birds and 32 mammals (26 native and six introduced mammals). Lists of expected species are provided in Tables 2 – 5, whilst Table 6 lists those species considered extinct from the region. Of the species expected, 14 are considered to be conservation significant. An annotated list of all species recorded during the site visit is provided in Appendix 4.

This section details each fauna group separately, discussing those species expected, those recorded and commenting on any conservation significant species.

3.3.1 Frogs

A total of eight frog species may occur in the study area (see Appendix 5), with only one, the Desert Spadefoot (*Notaden nichollsi*), recorded during the site visit. This species was heard calling in Vegetation Type 2 during spotlighting. Details of all species recorded are provided in the annotated list in Appendix 5. Previous work by Hart, Simpson and Associates (2002) recorded four frog species from the area.

One frog species, the Tanami Toadlet (*Uperoleia micromeles*), is considered to be conservation significant due to its regionally restricted distribution. Although this may reflect the lack of surveys throughout this area, within W.A. this species has a limited distribution with only a small number of records from the Great Sandy Desert.

Note: This species was not recorded during the survey.

3.3.2 Reptiles

A total of 94 reptile species may occur in the study area (see Appendix 5), with five recorded during the site visit. The low number of reptile species recorded reflects the low trapping effort, the cool weather experienced during the site visit and only limited time spent searching for microhabitat. Details of all species recorded are provided in the annotated list in Appendix 4. Previous work by Hart, Simpson and Associates (2002) recorded 38 reptile species from the area.

Two reptile species occurring in the region are considered to be conservation significant:

The **Great Desert Skink** (*Egernia kintorei*) is listed as Vulnerable under the EPBC Act and the WA Wildlife Conservation Act. This species appears to have suffered a major reduction in range since European settlement and now only occurs in a number of isolated subpopulations across arid inland Australia, three of which occur in WA. The species generally prefers sand-plain and sand-ridge habitats, such as those present within Sections 3 and 6. Threats to the species may include altered fire regimes, increased predation from introduced predators (e.g. foxes and feral cats) (Dept. of Env. and Heritage, 2006; Pavey, 2002). Although suitable habitats were searched for burrow systems, none were recorded.

The **Woma** or Ramsay's Python (*Aspidites ramsayi*) is listed as specially protected under Schedule 4 of the WA Wildlife Conservation Act. This listing is based on the status of the south western population, which is considered threatened by Maryan (2002). The more northerly population is not considered to be threatened.

Note: Neither of these species was recorded during the survey.

3.3.3 Birds

A total of 99 bird species may occur in the study area (see Appendix 5), of which 35 were recorded during the site visit. The most commonly recorded bird species were the Galah, Yellow-throated Miner and Singing Honeyeater. Details of all species recorded are provided in the annotated list in Appendix 4. Hart, Simpson and Associates (2002) recorded a total of 50 bird species from the study area.

None of the bird species recorded during the July 2006 survey were considered to be conservation significant, although there are six such species that may occur in the study area. It is expected that most of these species may occur in the study area on a periodic basis, in response to food availability.

The **Night Parrot** (*Pezoporus occidentalis*) is classified as Critically Endangered under the EPBC Act and the WA Wildlife Conservation Act. This poorly known species is believed to occur at low densities across the arid inland of Australia, preferring habitats dominated by *Triodia* sp. hummock grassland or chenopod shrublands. There have been recent unconfirmed records of the species from within the Pilbara, near the Fortescue Marshes (pers. obs.); this may be in response to cyclonic rains and the subsequent flush of new plant growth, including seeding Spinifex plants. Threats may include "predation by feral cats and foxes,

altered fire regimes, competition for food and degradation of habitat near water by stock or rabbits and reduced availability of water as a result of over-use by feral camels "(Garnett and Crowley, 2000). The habitats present within the study area appear suitable for the species, although due to the elusive nature of this species it is difficult to assess.

Major Mitchell's Cockatoo (*Cacatua leadbeateri*) and the **Peregrine Falcon** (*Falco peregrinus*) are classified as "Specially Protected" under Schedule 4 of the WA Wildlife Conservation Act. Both of these species are uncommon in the region (Barrett et. al, 2003).

The **Grey Falcon** (*Falco hypoleucos*) is classified as Priority 4 by the Dept. of Environment and Conservation, and Near Threatened by Garnett and Crowley (2000), due to a possible reduction in range and the sparsity of the population. Populations of the species appear to be centred on inland drainage systems, which provide nesting habitat and may provide a higher density of prey. The only known potential threat to this species, within the Pilbara, is overgrazing, which may affect prey abundance (Garnett and Crowley, 2000).

The **Australian Bustard** (*Ardeotis australis*) is classified as Priority 4 by the Dept. of Environment and Conservation, and Near Threatened by Garnett and Crowley (2000). The species has experienced major historical declines, predominantly within the southern parts of its range. Within the Telfer region, disturbance from humans, cattle or sheep during nesting and predation by foxes are probably the most relevant of the threats recognised by Garnett and Crowley (2000).

The **Princess Parrot** (*Polytelis alexandrae*) is classified as Priority 4 by the Dept. of Environment and Conservation, and Near Threatened by Garnett and Crowley (2000), due to the species decline over 50% of its range. The species is "irregularly present through much of the central and western arid zone" and utilises seeding plants in interdunal swales as a food resource (Garnett and Crowley, 2000). Factors responsible for the species decline may include habitat degradation and reduced food availability, due to altered fire regimes and the activities of introduced herbivores (e.g. sheep, rabbits and cattle).

3.3.4 Mammals

A total of 32 mammal species (26 native, six introduced) are expected to occur in the study area, of which seven species were recorded during the site visit (refer to Appendix 5). This included one dasyurid, two native rodents, two bats, the Dingo and the Feral Camel. In addition, old diggings believed to be those of the Greater Bilby were recorded in the section of the study area south of the existing waste dumps (Figure 13). Macropod prints, believed to those of a Euro, were seen in a swale to the west of the study area.



Figure 13 Two possible Greater Bilby diggings found south of the existing waste dumps

Details of all species recorded are provided in the annotated list in Appendix 4. No species of conservation significance were recorded during the survey. Hart, Simpson and Associates (2002) recorded 15 mammals from the area, including 12 native species and three introduced species.

There are five conservation significant mammal species that may occur in the study area:

The **Mulgara** (*Dasyercus cristicauda*) is listed as Vulnerable under the EPBC Act and the WA Wildlife Conservation Act. Current populations are small and isolated, generally occurring in mature hummock grasslands associated with drainage systems (including paleo-drainage) on sandy soils. Threats to the species may include “habitat destruction by changed fire regimes and introduced herbivores such as cattle and rabbits, and predation by feral cats and foxes” (Maxwell et. al, 1996). Sections 3 and 6 appeared to support habitats suitable for this species, although no burrows were found during the site visit.

The **Northern Marsupial Mole** (*Notoryctes caurinus*) is listed as Endangered under the EPBC Act and the WA Wildlife Conservation Act. This poorly known species has been collected from the Gibson and Great Sandy Deserts, including several specimens from near Telfer (Hart, Simpsons and Associates, 2002). It seems likely, though not definite, that this species has experienced a decline likely due to some of the factors affecting other CWR (Critical Weight Range) mammals, e.g. predation by foxes and feral cats, and altered fire regimes (Maxwell et. al, 1996; Burbidge and McKenzie, 1989). It is quite possible that this species occurs in the sand-dune habitats present in Section 6.

The **Greater Bilby** (*Macrotis lagoti*) is listed as Vulnerable under the EPBC Act and the WA Wildlife Conservation Act. Although formerly occurring over much of mainland Australia, the Greater Bilby is now restricted to the Western Deserts (Tanami, Gibson and Great Sandy),

adjacent parts of the Pilbara and Kimberleys and also south western Queensland. The species occupies a range of habitats, although these may represent the least favourable within their former range (Pavey, 2005). Some threats to the species include increased predation by introduced predators (e.g. feral cats and foxes), habitat degradation and increased competition through introduced herbivores (e.g. rabbits, cattle and feral camels) and altered fire regimes (Pavey, 2005). As mentioned previously, a number of old diggings, possibly those of the Greater Bilby, were recorded south of the existing waste dumps (between the waste dumps and the road). As this species is known to move in response to food availability and changing vegetation cover (Johnson, 1989), it is possible that the species occurs in the study area on a periodic basis.

The **Spectacled Hare-Wallaby** (*Lagorchestes conspicillatus leichardti*) is classified as Priority 3 by the Dept. of Environment and Conservation, and Lower Risk (near threatened) by Maxwell et. al. (1996). Within WA, this species has experienced a significant population decline and fragmentation (Maxwell, et. al, 1996) and now only abundant as several isolated populations in the Pilbara and Kimberley regions. It occurs in a range of habitat types, including Spinifex sandplains, such as those present around Telfer (Vegetation Types 1, 2 and 3). The main threats to this species include introduced predators (e.g. feral cats and foxes), competition from introduced herbivores (e.g. rabbits and cattle) and altered fire regimes.

The **Pilbara Pebble-mound Mouse** (*Pseudomys chapmani*) is classified as Priority 4 by the Dept. of Environment and Conservation. Lee (1995) listed the species as being insufficiently known, however work conducted since has rectified the situation. This species often occurs on low stony hills, such as those found supporting Vegetation Type 5 (i.e. *Triodia schinzii* on rocky outcrops).

4.0 DISCUSSION

4.1 CONSERVATION VALUES

The conservation value of this region of the Great Sandy Desert is high because of a large number of biodiversity assets (particularly the presence of rare and endangered fauna), and pristine condition of the area. Generally the condition of the area is excellent with few weed species recorded during the survey (Appendix 2). Some areas surrounding mining activities show localised disturbance but are still in good condition.

Vegetation and floristic conservation values are not considered regionally significant within the study area as they are adequately represented elsewhere in the region, with the exception of the Priority 2 species *Goodenia* sp. Rudall River which was recorded at 4 locations.

The fauna conservation values are high due to the presence of suitable habitat for at least one vulnerable species. The presence of suitable fauna habitat for the Greater Bilby was noted as old burrowing activity was seen during this survey.

Conservation values of the site relate mainly to the following biodiversity assets:

Rare plants and animals

- Presence of the Priority 2 species *Goodenia* sp. Rudall River;
- Presence of habitat suitable for the vulnerable Greater Bilby.

These are the most significant conservation values identified within the study site. The waste dump extension will impact significantly on the plant species, with four populations of *Goodenia* sp. Rudall River directly impacted by the proposed waste dump expansion (~170 plants).

Special living assemblages, such as samples of local ecotypes, sites with a high level of endemism, unusual associations of plants, sites of unusually high species diversity

- Presence of unusual associations of plants – *Aluta maisonneuvei* dominant vegetation association present on the slopes and crest of the dunes.

In our experience, it is very unusual to have *Aluta maisonneuvei* present on the slopes and crest of the dunes within the Telfer Region. This species is usually found at the base of sand dunes or in dune swales.

4.2 ENVIRONMENTAL IMPACTS AND RECOMMENDATIONS**4.2.1 Landforms, Vegetation and Flora****Impacts**

In no instance does the proposed waste dump expansion fully displace a landform or vegetation unit, species habitat, or species population.

All vegetation associations surveyed in the study areas are considered regionally common, except the unusual locally dominant association of *Aluta maisonneuvei* on the dune crests. The sand dunes also provide habitat, which potentially supports a large number of different fauna types, including a number of threatened species e.g. Northern Marsupial Moles and the Great Desert Skink.

The proposed waste dump expansion will impact on the population of *Goodenia* sp. Rudall River, with 4 populations located within the study area. *Goodenia* sp. Rudall River appears to be an opportunistic species which prefers disturbed areas, with most populations found adjacent to tracks. The species is superficially similar to *Goodenia azurea*, which is a very common species around the Telfer site. It is possible that *Goodenia* sp. Rudall River is present within *Goodenia azurea* populations in other areas of the site, as mixed populations were present during this survey.

Although Telfer lies in an area of low rainfall, some vegetation types are sensitive to changes in hydrology and adverse impacts can lead to broad-scale habitat degradation, consequently impacting fauna utilising such areas. Hydrological impacts from the waste dump must be minimised to reduce the impact on vegetation communities, particularly the low lying areas

within the *Acacia stipuligera* Shrubland vegetation type, in which *Goodenia* sp. Rudall River Population 3 occurs.

Recommendations

- It is recommended to undertake a comprehensive Telfer site/regional survey for *Goodenia* sp. Rudall River to provide a better understanding of its actual distribution and conservation significance.
- As the dunes are at the boundary of the very southern extent of the proposed expansion it is recommended the sand dunes should be avoided.
- Minimise hydrological impacts of the proposed waste dump to avoid off site impacts of adjacent areas.

4.2.2 Fauna

Impacts

The predominant impacts of the proposed waste dump expansion are those associated with potential loss of habitat previously used by Greater Bilbies (as recorded through old diggings).

Recommendations

- A number of threatened fauna species that may be present within the Telfer region are considered either nomadic or cryptic. Such species may be present within the area of interest, but not recorded during the initial fauna assessment. Therefore sites should be traversed on foot, prior to any clearing, so as to check for burrowing activities of threatened fauna, such as Great Desert Skink, Greater Bilby, Northern Marsupial Mole. If recent burrowing activity is present, the area should not be cleared.
- In terms of fauna, the final waste dump design should minimise fragmentation of habitats as fragmentation is likely to reduced biodiversity and, in some situations, only supports a small proportion of the original fauna assemblage.

4.2.3 Construction

Impacts

Dust impacts and distribution of fines into adjacent areas are to be avoided due to potential impacts on vegetation and drainage.

Recommendations

- Dust impacts and movement of soils beyond the allowable area of works are to be avoided.

4.2.4 Post-Construction Monitoring

Recommendation

Post-construction monitoring is required in the vegetation surrounding the proposed waste dump, once after completion of construction works, and once annually thereafter (before seed set of annuals). The extent of the monitoring will need to be determined after the final design of the waste dump has been completed. Post-construction monitoring is to be carried out by Newcrest with reports sent to the Department of Environment and Conservation (DEC).

Post-construction monitoring is required to assess the following:

- Mortality of rare fauna,
- Presence of weeds, and
- Impacts of dust or any other impacts on adjacent vegetation and fauna.

Construction of the proposed waste dump shall comply with all normal procedures minimising the areas disturbed, and rehabilitating disturbed areas in line with approved Environmental Guidelines and Conditions (Newcrest Mining Ltd, 2003a and 2003b). Recommendations outlined in the Environmental Protection Authority Bulletin 1127 must be strictly adhered to.

5.0 REFERENCES

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APPENDICES

Appendix 1 Rare and Priority Flora Potentially Present

Species previously recorded in the area (Ecologia) and Hart, Simpson and Associates (2000)

Name	Priority	Habitat	Distinguishing Features
<i>Fimbristylis</i> sp. Shay Gap (K Newbey 10293)	1		
<i>Goodenia lyrata</i>	1	Low lying areas around Telfer road where the route joins the road. Near claypans.	Prostrate herb with Yellow flowers in August
<i>Bulbostylis burbridgeae</i>	3		
<i>Dampiera atriplicina</i>	2	Found on base, sides, crests of dune and swales, usually in high density.	Grey white foliage, small red-purple flowers.
<i>Euphorbia clementii</i>	2	Found on rocky scree slopes	
<i>Goodenia</i> sp. Rudall River	2	Occurs at the base of dunes and across interdunal sandy plains	Similar to <i>Goodenia azurea</i> but has 'sticky' leaves
<i>Thysanotus</i> sp. Desert East of Newman (R.P. Hart 964)	2		
<i>Abutilon trudgenii</i>	3	Found on road verges and disturbed areas.	
<i>Comesperma pallidum</i>	3	Sandy loam interdunal plains	Tall spindly shrub, small yellow flowers at the end of terminal spikes
<i>Fuirena incrassata</i>	3	Low lying sites	

Other species potentially present but not yet recorded (DRF and Priority Flora List, CALM 30 June 2006).

Name	Priority
<i>Acacia aphanoclada</i>	1
<i>Acacia cyperophylla</i> var. <i>omearana</i>	1
<i>Atriplex spinulosa</i>	1
<i>Eremophila tenella</i> ms	1
<i>Goodenia</i> sp. East Pilbara (A.A. Mitchell PRP 727)	1
<i>Indigofera ixocarpa</i> ms	2
<i>Sauropus arenosus</i>	3

Appendix 2 Flora Species List

Site	Rocky Outcrop	Dune Crest	Sandplain (Dune Swales)
DICOTYLEDONS			
AIZOACEAE			
<i>Trianthema turgidifolia</i>	x		
AMARANTHACEAE			
<i>Gomphrena cunninghamii</i>			x
<i>Ptilotus polystachyus</i>			x
<i>Ptilotus ? polystachyus var. polystachyus</i>			x
<i>Ptilotus astrolasius var. astrolasius</i>			x
<i>Ptilotus calostachyus var. calostachyus</i>			x
<i>Ptilotus clementii</i>			x
<i>Ptilotus exaltatus</i>			x
<i>Ptilotus sp. cf. polystachyus</i>			x
<i>Ptilotus sphacelatum</i>	x		
ASTERACEAE			
<i>Pluchea tetranthera</i>			x
<i>Pterocaulon sphacelatum</i>			x
<i>Streptoglossa macrocephala</i>			x
BORAGINACEAE			
<i>? Heliotropium sp</i>			x
<i>Halgania solanacea var. solanacea</i>			x
<i>Heliotropium glanduliferum</i>	x		x
CAESALPINIACEAE			
<i>Petalostylis cassioides</i>		x	
<i>Senna artemisioides subsp. oligophylla</i>			x
<i>Senna glutinosa subsp. glutinosa</i>	x		
<i>Senna notabilis</i>			x
<i>Senna sericea</i>	x		
CAPPARACEAE			
<i>Cleome viscosa</i>			x
CHENOPODIACEAE			
<i>Dysphania rhadinostachya</i>			x
<i>Maireana tomentosa</i>	x		
<i>Salsola tragus subsp. tragus</i>			x
CONVOLVULACEAE			
<i>Bonamia linearis</i>			x
CUCURBITACEAE			
<i>Mukia maderaspatana</i>			x

Site	Rocky Outcrop	Dune Crest	Sandplain (Dune Swales)
EUPHORBIACEAE			
<i>Euphorbia ? myrtoides- glabrous</i>			x
<i>Euphorbia ? myrtoides- hairy</i>			x
GOODENIACEAE			
<i>Dampiera candidans</i>			x
<i>Goodenia ? armitiana</i>			x
<i>Goodenia hartiana ms</i>			x
<i>Goodenia armitiana</i>			x
<i>Goodenia azurea subsp. hesperia ms</i>			x
<i>Goodenia stobbsiana</i>			x
<i>Goodenia triodiophila</i>	x		x
<i>Scaevola parvifolia subsp pilbarae</i>			x
<i>Velleia connata</i>			x
GYROSTEMONACEAE			
<i>Codonocarpus cotinifolius</i>			x
HALORAGACEAE			
<i>Gonocarpus eremophilus</i>			x
LAMIACEAE			
<i>Clerodendrum floribundum var. coriaceum</i>			x
<i>Dicrastylis doranii</i>		x	
<i>Newcastelia cladotricha</i>			x
LAURACEAE			
<i>Cassytha ? capillaris</i>			x
LOGANIACEAE			
<i>Logania centralis</i>			x
MALVACEAE			
<i>Hibiscus burtonii</i>			x
<i>Hibiscus leptocladus</i>			x
<i>Sida clementii</i>			x
<i>Sida pilbarensis ms</i>			x
MIMOSACEAE			
<i>Acacia sphaerostachya</i>			x
<i>Acacia ? ampliceps x sclerosperma</i>	x		x
<i>Acacia adoxa var. adoxa</i>			x
<i>Acacia aluta</i>			x
<i>Acacia ampliceps</i>			x
<i>Acacia ancistrocarpa</i>	x		x
<i>Acacia colei var. colei</i>			x
<i>Acacia hilliana</i>			x
<i>Acacia ligulata</i>		x	x

Site	Rocky Outcrop	Dune Crest	Sandplain (Dune Swales)
<i>Acacia melleodora</i>			x
<i>Acacia pyrifolia</i> var. <i>pyrifolia</i>			x
<i>Acacia sabulosa</i>		x	
<i>Acacia sericophylla</i>			x
<i>Acacia</i> sp. <i>Barkly</i>			x
<i>Acacia stellaticeps</i>			x
<i>Acacia stipuligera</i>			x
<i>Acacia trachycarpa</i>			x
MOLLUGINACEAE			
<i>Mollugo molluginis</i>			x
MYOPORACEAE			
<i>Eremophila ? latrobei</i> subsp. <i>latrobei</i>	x		
<i>Eremophila tietkensis</i>	x		
MYRTACEAE			
<i>Aluta maissoneuvei</i> subsp. <i>maissoneuvei</i>		x	x
<i>Calytrix carinata</i>			x
<i>Corymbia aspera</i>			x
<i>Corymbia chippendalei</i>		x	
<i>Corymbia opaca</i>			x
<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i>	x		
<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> (1)			x
<i>Eucalyptus leucophloia</i> subsp. <i>leucophloia</i> (2)			x
NYCTAGINACEAE			
<i>Indigofera boviperda</i>			x
PAPILIONACEAE			
? <i>Cajanus cinereus</i>			x
<i>Gompholobium polyzygum</i>			x
<i>Jacksonia aculeata</i>			x
<i>Mirbelia viminalis</i>			x
<i>Tephrosia arenicola</i>			x
PROTEACEAE			
? <i>Hakea/ Grevillea</i>			x
<i>Grevillea stenobotrya</i>	x	x	x
<i>Grevillea wickhamii</i>			x
<i>Hakea chordophylla</i>			x
RUBIACEAE			
<i>Oldenlandia crouchiana</i>	x		
<i>Psyrax latifolia</i>			x
SANTALACEAE			
<i>Exocarpos sparteus</i>			x
<i>Anthobolus leptomerioides</i>			x

Site	Rocky Outcrop	Dune Crest	Sandplain (Dune Swales)
SAPINDACEAE			
<i>Diplopeltis stuartii</i> var. <i>stuartii</i>			x
<i>Dodonaea coriacea</i>			x
SOLANACEAE			
<i>Solanum centrale</i>			x
STERCULIACEAE			
<i>Keraudrenia velutina</i> subsp. <i>elliptica</i>			x
SURIANACEAE			
<i>Stylobasium spathulatum</i>			x
TILIACEAE			
<i>Corchorus ? walcottii</i>			x
ZYGOPHYLLACEAE			
<i>Tribulus suberosus</i>			x
MONOCOTYLEDONS			
CYPERACEAE			
? <i>Fimbristylis</i> sp.			x
<i>Bulbostylis barbata</i>			x
<i>Cyperus</i> cf. <i>cunninghamii</i>			x
<i>Fimbristylis dichotoma</i>	x		
POACEAE			
? <i>Eriachne ovata</i>			x
<i>Amphipogon caricinus</i>			x
<i>Aristida contorta</i>			x
<i>Aristida holathera</i>			x
<i>Aristida holathera</i> var. <i>holathera</i>			x
<i>Aristida inaequiglumis</i>			x
<i>Cenchrus ciliaris</i>			x
<i>Enneapogon caeruleus</i>			x
<i>Enneapogon polyphyllus</i>			x
<i>Eragrostis eriopoda</i>			x
<i>Eriachne aristidea</i>	x		x
<i>Eriachne ciliata</i>	x		
<i>Eriachne mucronata</i>			x
<i>Eriachne pulchella</i>			x
<i>Paraneurachne muelleri</i>			x
<i>Schizachyrium fragile</i>			x
<i>Triodia ? epactia</i>			x
<i>Triodia ? pungens</i>	x		x
<i>Triodia ? schinzii</i>			x
<i>Triodia basedowii</i>	x		x
<i>Triodia schinzii</i>	x	x	x
<i>Yakirra australiensis</i>			x

Appendix 3 Categories used in the Assessment of Conservation Status of fauna

Environmental Protection and Biodiversity Conservation (EPBC) Act and the WA Wildlife Conservation Act [Categories from IUCN, based on review by Mace and Stuart (1994)].

EX	Extinct	Taxa not definitely located in the wild during the past 50 years.
EW	Extinct in the wild	Taxa known to survive only in captivity.
CE	Critically Endangered	Taxa facing an extremely high risk of extinction in the wild in the immediate future.
EN	Endangered	Taxa facing a very high risk of extinction in the wild in the near future.
VU	Vulnerable	Taxa facing a very high risk of extinction in the wild in the medium-term future.
NrT	Near Threatened	Taxa at risk becoming Vulnerable in the wild.
CD	Conservation Dependent	Taxa whose survival depends upon ongoing conservation measures. Without these measures, a conservation dependent taxon would be classed as Vulnerable or more severely threatened.
DD	Data Deficient	Taxa suspected of being Rare, Vulnerable or Endangered, but whose true status cannot be determined without more information.
LC	Least Concern	Taxa that are not Threatened.
SC4	Specially Protected	Taxa listed as specially protected under Schedule 4 of the WA Wildlife Conservation Act.

WA Department of Environment and Conservation Priority Species (species not listed under the Conservation Act, but for which there is some concern).

Priority 1	Taxa with few, poorly known populations on threatened lands.
Priority 2	Taxa with few, poorly known populations on conservation lands; or taxa with several, poorly known populations not on conservation lands.
Priority 3	Taxa with several, poorly known populations, some on conservation lands.
Priority 4	Taxa in need of monitoring.
Priority 5	Conservation dependent species.

Regionally Significant Fauna (RS)

Taxa that, within the current study area, are considered to be:

- Uncommon;
- On the edge of the distribution; or
- Undergoing taxonomic revision.

**Appendix 4 Annotated list of species recorded from the Telfer study area
(bracketed numbers represent dates)**

Frogs

Desert Spadefoot (*Notaden nichollsi*)

Several individuals heard calling in Section 3 (6/7).

Reptiles

Gecko (*Gehyra purpurascens*)

One caught at Section 6 (8/7).

Central Military Dragon (*Ctenophorus isolepis*)

Common throughout the site (6-8/7).

Blue-lined Dragon (*Diporiphora winneckeï*)

Dead specimen found in camp (6/7).

Spiny-tailed Monitor (*Varanus acanthurus*)

Family group of 3 found in Telstra access pit in Section 5 (7/7).

Mulga Snake (*Pseudechis australis*)

One seen crossing track near Brierty workshops (7/7).

Birds

Grey Teal	Large numbers recorded from the old sewerage ponds and a smaller group on the new ponds (9/7).
Australasian Grebe	One individual recorded from the new sewerage ponds(9/7).
Straw-necked Ibis	One seen in roadside sump near Section 6 (7/7).
Collared Sparrowhawk	One seen in dense vegetation surrounding roadside sump near Section 6 (8/7)
Little Eagle	One seen overhead at Section 1 (6/7), Section 4 (7/7).
Brown Falcon	At least one pair seen around Section 2 (5/7).
Nankeen Kestrel	Several individual birds seen throughout the site (5-7/7).
Black-fronted Dotterel	10+ birds seen at the new sewerage ponds (9/7).
Red-capped Plover	One individual seen at the new sewerage ponds (9/7).
Black-winged Stilt	Group of four seen at the new sewerage ponds (9/7).
Common Bronzewing	Two individuals seen around camp (5,8/7).
Crested Pigeon	Flocks of 2 - 20 seen around site (5-9/7).
Spinifex Pigeon	Flocks of 2 - 20+ seen around site (6-9/7).
Diamond Dove	Small flock of 4 seen in Section 7 (9/7).
Galah	Abundant around site, especially the camp (4-8/7).

Red-backed Kingfisher	Several seen throughout the site on a regular basis (5, 8/7).
Rainbow Bee-eater	Several birds heard in <i>Eucalypt</i> woodland to the east of the site (9/7).
Variegated Fairy-wren	Several groups seen in <i>Acacia</i> thickets of Section 7 (8/7).
Yellow-throated Miner	Abundant around site, especially at the camp (4-8/7).
Singing Honeyeater	Common throughout site (5-8/7). Nesting activity observed in Section 3 (6/7).
Grey-headed Honeyeater	Common in Sections F & G (7-8/7). Nesting activity observed in Section 3 (7/7).
Magpie-Lark	Moderately common throughout site, with occasional flocks of 30+ (5-10/7).
Willie Wagtail	Several recorded from Section 7 (7-9/7).
Black-faced Cuckoo-Shrike	One seen in the main mine area (10/7).
White-breasted Woodswallow	One seen in the central mine area (10/7).
Masked Woodswallow	Several seen throughout site (5/7).
Black-faced Woodswallow	A flock of ~10 seen on road near Section 1 (6/7).
Little Woodswallow	Several seen in main mine area (7/7).
Torresian Crow	A small group seen regularly around the new landfill site (7-8/7).
Richard's Pipit	One seen in rehab area of Section 2 (6/7).
Zebra Finch	Moderately common throughout site (5-8/7).
Painted Finch	Small group seen in rocky hill habitat of Section 6 (8/7).
White-backed Swallow	Several seen regularly throughout site (5-8/7).
Welcome Swallow	Several recorded from around the sewerage ponds (9/7).
Fairy Martin	Several individuals recorded from Section 5 (8/7)

Mammals

Little Red Kaluta (*Dasykaluta rosamondae*)

Two caught in Elliott traps in Section 3 (7/7)

Bilby, Dalgyte (*Macrotis lagotis*)

Old diggings recorded from Section 7 (7/7).

Unidentified Kangaroo (probably Euro, *Macropus robustus*)

Small macropod prints (15 cm long) seen along road in Section 7 (8/7), and in a dune swale to the west of the study area (9/7)

Hill's Sheath-tail-bat (*Taphozous hilli*)

A cave-colony recorded from west of the minesite (9/7).

Gould's Wattled Bat (*Chalinolobus gouldii*)

Recorded using the Anabat system, from Section 4 (9/7)

Desert Mouse (*Pseudomys desertor*)

One (♂) caught in Elliott trap in Section 2 (6/7).

Sandy Inland Mouse (*Pseudomys hermannsburgensis*)

Five caught in Elliott traps in Section 3 (♂♀ - 6/7; ♂♂♀ - 7/7) and possibly another one in Section 6 (escaped before proper identification-10/7).

Dingo (*Canis lupus dingo*)

Footprints seen in abundance throughout site (5-10/7). Two seen in camp (6, 8/7), one seen in Section 6 (7/7).

Feral Dromedary, Camel (*Camelus dromedarius*)

Footprints recorded in Sections 2 and 6 (5, 7-8/7).

Appendix 5 Fauna species expected to occur in the study area

Table 2 Frogs that are expected to occur in the study area

Those indicated by (x) were recorded during the July survey. Other codes relate to conservation significance and are explained in Appendix 3.

SCIENTIFIC NAME	COMMON NAME	Status
Family: HYLIDAE	Tree Frogs	
<i>Cyclorana maini</i>	Main's Frog	
<i>Cyclorana platycephala</i>	Water-holding Frog	
<i>Litoria rubella</i>	Desert Tree Frog	
Family: MYOBATRACHIDAE	Burrowing Frogs	
<i>Limnodynastes spenceri</i>	Spencer's Frog	
<i>Neobatrachus aquilonius</i>	Northern Burrowing Frog	
<i>Notaden nichollsi</i>	Desert Spadefoot	x
<i>Uperoleia micromeles</i>	Tanami Toadlet	RS
<i>Uperoleia russelli</i>	Russell's Toadlet	

Table 3 Reptiles that are expected to occur in the study area

Those indicated by (x) were recorded during the July survey. Other codes relate to conservation significance and are explained in Appendix 3.

SCIENTIFIC NAME	COMMON NAME	Status
Family: GEKKONIDAE	Geckoes	
<i>Diplodactylus conspicillatus</i>	Fat-tailed Gecko	
<i>Diplodactylus stenodactylus</i>	Sand-plain Gecko	
<i>Nephrurus laevis</i>	Pale Knob-tailed Gecko	
<i>Nephrurus levis</i>	Smooth Knob-tailed Gecko	
<i>Rhynchoedura ornata</i>	Beaked Gecko	
<i>Strophurus ciliaris</i>	Northern Spiny-tailed Gecko	
<i>Strophurus elderi</i>	Jewelled Gecko	
<i>Strophurus jeanae</i>		
<i>Gehyra pilbara</i>	Pilbara Dtella	
<i>Gehyra purpurascens</i>		x
<i>Gehyra variegata</i>	Varied Dtella	
<i>Heteronotia binoei</i>	Bynoe's Gecko	
Family: PYGOPODIDAE	Legless Lizards	
<i>Delma borea</i>		
<i>Delma butleri</i>		
<i>Delma haroldi</i>		
<i>Delma nasuta</i>		
<i>Delma pax</i>		
<i>Delma tincta</i>		
<i>Lialis burtonis</i>	Burton's Legless Lizard	
<i>Pygopus nigriceps</i>	Western Hooded Scale-foot	
Family: SCINCIDAE	Skink Lizards	
<i>Carlia triacantha</i>		
<i>Cryptoblepharus carnabyi</i>		
<i>Cryptoblepharus plagiocephalus</i>	Fence Skink	
<i>Ctenotus ariadnae</i>		
<i>Ctenotus brooksi</i>		
<i>Ctenotus calurus</i>	Blue-tailed Ctenotus	
<i>Ctenotus dux</i>	Narrow-lined Ctenotus	
<i>Ctenotus grandis</i>		
<i>Ctenotus hanloni</i>		
<i>Ctenotus helenae</i>		
<i>Ctenotus leae</i>		
<i>Ctenotus leonhardii</i>		
<i>Ctenotus nasutus</i>		
<i>Ctenotus pantherinus</i>	Leopard Ctenotus	
<i>Ctenotus piankai</i>		
<i>Ctenotus quattuordecimlineatus</i>	Fourteen-lined Ctenotus	
<i>Ctenotus saxatilis</i>	Rock Ctenotus	
<i>Ctenotus schomburgkii</i>		
<i>Ctenotus serventyi</i>		
<i>Cyclodomorphus melanops</i>		
<i>Egernia depressa</i>	Pygmy Spiny-tailed	

	Skink	
<i>Egernia kintorei</i>	Great Desert Skink	VU
<i>Egernia striata</i>	Night Skink	
<i>Eremiascincus fasciolatus</i>	Narrow-banded Sand-swimmer	
<i>Eremiascincus richardsonii</i>	Broad-banded Sand-swimmer	
<i>Lerista bipes</i>		
<i>Lerista ips</i>		
<i>Lerista labialis</i>		
<i>Lerista muelleri</i>		
<i>Lerista vermicularis</i>		
<i>Lerista xanthura</i>		
<i>Menetia greyii</i>	Grey's Skink	
<i>Morethia ruficauda</i>		
<i>Notoscincus ornatus</i>		
<i>Proablepharus reginae</i>		
<i>Tiliqua multifasciata</i>	Centralian Blue-tongue	
Family: AGAMIDAE	<i>Dragons</i>	
<i>Ctenophorus caudicinctus</i>	Ring-tailed Dragon	
<i>Ctenophorus clayi</i>	Black-collared Dragon	
<i>Ctenophorus isolepis</i>	Central Military Dragon	x
<i>Ctenophorus nuchalis</i>	Central Netted Dragon	
<i>Diporiphora winneckeii</i>	Blue-lined Dragon	x
<i>Moloch horridus</i>	Thorny Devil	
<i>Pogona minor</i>	Western Bearded Dragon	
<i>Tympanocryptis cephalo</i>	Pebble Dragon	
Family: VARANIDAE	<i>Monitors</i>	
<i>Varanus acanthurus</i>	Spiny-tailed Monitor	x
<i>Varanus brevicauda</i>	Short-tailed Pygmy Monitor	
<i>Varanus caudolineatus</i>	Stripe-tailed Monitor	
<i>Varanus eremius</i>	Desert Monitor	
<i>Varanus giganteus</i>	Perentie	
<i>Varanus gilleni</i>	Pygmy Mulga Monitor	
<i>Varanus gouldii</i>	Gould's Monitor	
<i>Varanus pilbarensis</i>	Pilbara Rock Monitor	
<i>Varanus tristis</i>	Black-headed Monitor	
Family: TYPHLOPIDAE	<i>Blind Snakes</i>	
<i>Ramphotyphlops ammodytes</i>		
<i>Ramphotyphlops diversus</i>		
<i>Ramphotyphlops endoterus</i>		
<i>Ramphotyphlops grypus</i>	Beaked Blind Snake	
Family: BOIDAE	<i>Pythons</i>	
<i>Antaresia perthensis</i>	Pygmy python	
<i>Antaresia stimsoni</i>	Stimson's python	
<i>Aspidites melanocephalus</i>	Black-headed python	
<i>Aspidites ramsayi</i>	Woma	SC4
Family: ELAPIDAE	<i>Front-fanged Snakes</i>	
<i>Acanthophis pyrrhus</i>	Desert Death-adder	
<i>Acanthophis wellsi</i>	Pilbara Death-adder	
<i>Brachyurophis approximans</i>	Northwestern Shovel-nosed Snake	
<i>Brachyurophis fasciolata</i>	Narrow-banded Shovel-	

	nosed Snake	
<i>Demansia psammophis</i>	Yellow-faced Whipsnake	
<i>Demansia rufescens</i>	Rufous Whipsnake	
<i>Furina ornata</i>	Moon Snake	
<i>Pseudechis australis</i>	Mulga Snake	x
<i>Pseudonaja modesta</i>	Ringed brown snake	
<i>Pseudonaja nuchalis</i>	Gwardar	
<i>Simoselaps anomalus</i>	Desert banded snake	
<i>Suta fasciata</i>	Rosen`s snake	
<i>Suta punctata</i>	Spotted snake	

Table 4 Birds that are expected to occur in the study area.

Those indicated by (x) were recorded during the July survey. Other codes relate to conservation significance and are explained in Appendix 1.

SCIENTIFIC NAME	COMMON NAME	Status
Family: CASUARIIDAE	Emu	
<i>Dromaius novaehollandiae</i>	Emu	
Family: PHASIANIDAE	True Quail and Allies	
<i>Coturnix ypsilophora</i>	Brown Quail	
Family: ANATIDAE	Ducks and Allies	
<i>Anas superciliosa</i>	Pacific Black Duck	
<i>Anas gracilis</i>	Grey Teal	x
Family: PODICIPEDIDAE	Grebes	
<i>Tachybaptus novaehollandiae</i>	Australasian Grebe	x
Family: ARDEIDAE	Hérons, Egrets and Bitterns)	
<i>Egretta novaehollandiae</i>	White-faced Heron	
<i>Ardea pacifica</i>	White-necked Heron	
Family: THRESKIORNITHIDAE	Ibis and Spoonbills	
<i>Threskiornis spinicollis</i>	Straw-necked Ibis	x
<i>Platalea regia</i>	Royal Spoonbill	
Family: ACCIPITRIDAE	Eagles, Hawks and Kites	
<i>Elanus axillaris</i>	Black-shouldered Kite	
<i>Milvus migrans</i>	Black Kite	
<i>Haliastur sphenurus</i>	Whistling Kite	
<i>Circus assimilis</i>	Spotted Harrier	
<i>Accipiter fasciatus</i>	Brown Goshawk	
<i>Accipiter cirrhocephalus</i>	Collared Sparrowhawk	x
<i>Aquila audax</i>	Wedge-tailed Eagle	
<i>Hieraaetus morphnoides</i>	Little Eagle	x
Family: FALCONIDAE	Falcons	
<i>Falco berigora</i>	Brown Falcon	x
<i>Falco longipennis</i>	Australian Hobby	
<i>Falco peregrinus</i>	Peregrine Falcon	SC4
<i>Falco cenchroides</i>	Nankeen Kestrel	x
<i>Falco hypoleucos</i>	Grey Falcon	P4
Family: OTIDIDAE	Bustards	
<i>Ardeotis australis</i>	Australian Bustard	P4
Family: TURNICIDAE	Button-quails	
<i>Turnix velox</i>	Little Button-quail	
Family: CHARADRIIDAE	Plovers and Dotterels	
<i>Euseyonis melanops</i>	Black-fronted Dotterel	x
<i>Charadrius ruficapillus</i>	Red-capped Plover	x
Family: RECURVIROSTRIDAE	Stilts and Avocets	
<i>Himantopus himantopus</i>	Black-winged Stilt	x

Family: COLUMBIDAE	Doves and Pigeons	
<i>Phaps chalcoptera</i>	Common Bronzewing	x
<i>Ocyphaps lophotes</i>	Crested Pigeon	x
<i>Geophaps plumifera</i>	Spinifex Pigeon	x
<i>Geopelia cuneata</i>	Diamond Dove	x
<i>Geopelia striata</i>	Peaceful Dove	
Family: CACATUIDAE	Cockatoos	
<i>Eolophus roseicapilla</i>	Galah	x
<i>Cacatua sanguinea</i>	Little Corella	
<i>Nymphicus hollandicus</i>	Cockatiel	
<i>Cacatua leadbeateri</i>	Major Mitchell's Cockatoo	SC4
Family: PSITTACIDAE	Parrots and Lorikeets	
<i>Polytelis alexandrae</i>	Princess Parrot	P4
<i>Barnardius zonarius</i>	Australian Ringneck	
<i>Melopsittacus undulatus</i>	Budgerigar	
<i>Pezoporus occidentalis</i>	Night Parrot	CE
Family: CUCULIDAE	Cuckoos	
<i>Cuculus pallidus</i>	Pallid Cuckoo	
<i>Chrysococcyx osculans</i>	Black-eared Cuckoo	
<i>Chrysococcyx basalis</i>	Horsfield's Bronze-Cuckoo	
Family: CENTROPODIDAE	Coucals	
<i>Centropus phasianinus</i>	Pheasant Coucal	
Family: STRIGIDAE	Hawk Owls	
<i>Ninox connivens</i>	Barking Owl	
<i>Ninox novaeseelandiae</i>	Southern Boobook	
Family: TYTONIDAE	Masked Owls	
<i>Tyto alba</i>	Barn Owl	
Family: PODARGIDAE	Frogmouths	
<i>Podargus strigoides</i>	Tawny Frogmouth	
Family: CAPRIMULGIDAE	Nightjars	
<i>Eurostopodus argus</i>	Spotted Nightjar	
Family: AEGOTHELIDAE	Owlet-nightjars	
<i>Aegotheles cristatus</i>	Australian Owlet-nightjar	
Family: HALCYONIDAE	Kingfishers	
<i>Todiramphus pyrrhopygia</i>	Red-backed Kingfisher	x
Family: MEROPIIDAE	Bee-eaters	
<i>Merops ornatus</i>	Rainbow Bee-eater	x
Family: MALURIDAE	Australian Wrens	
<i>Malurus lamberti</i>	Variiegated Fairy-wren	x
<i>Malurus leucopterus</i>	White-winged Fairy-wren	
<i>Stipiturus ruficeps</i>	Rufous-crowned Emu-wren	
<i>Amytornis striatus</i>	Striated Grasswren	
Family: PARDALOTIDAE	Pardalotes and Allies	
<i>Pardalotus rubricatus</i>	Red-browed Pardalote	
<i>Pardalotus striatus</i>	Striated Pardalote	
<i>Smicronis brevirostris</i>	Weebill	
<i>Gerygone fusca</i>	Western Gerygone	

Family: MELIPHAGIDAE	Honeyeaters and Chats	
<i>Acanthagenys rufogularis</i>	Spiny-cheeked Honeyeater	
<i>Manorina flavigula</i>	Yellow-throated Miner	x
<i>Lichenostomus virescens</i>	Singing Honeyeater	x
<i>Lichenostomus keartlandi</i>	Grey-headed Honeyeater	x
<i>Lichenostomus penicillatus</i>	White-plumed Honeyeater	
<i>Lichmera indistincta</i>	Brown Honeyeater	
<i>Phylidonyris albifrons</i>	White-fronted Honeyeater	
<i>Certhionyx niger</i>	Black Honeyeater	
<i>Certhionyx variegatus</i>	Pied Honeyeater	
<i>Epthianura tricolor</i>	Crimson Chat	
Family: PETROICIDAE	Australian Robins	
<i>Petroica goodenovii</i>	Red-capped Robin	
<i>Melanodryas cucullata</i>	Hooded Robin	
Family: PACHYCEPHALIDAE	Whistlers and Allies	
<i>Oreoica gutturalis</i>	Crested Bellbird	
<i>Pachycephala rufiventris</i>	Rufous Whistler	
<i>Colluricincla harmonica</i>	Grey Shrike-thrush	
Family: DICRURIDAE	Flycatchers, Fantails and Drongos	
<i>Grallina cyanoleuca</i>	Magpie-Lark	x
<i>Rhipidura leucophrys</i>	Willie Wagtail	x
Family: CAMPEPHAGIDAE	Cuckoo-shrikes and Trillers	
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-Shrike	x
Family: ARTAMIDAE	Woodswallows, Butcherbirds and Allies	
<i>Artamus leucorhynchus</i>	White-breasted Woodswallow	x
<i>Artamus personatus</i>	Masked Woodswallow	x
<i>Artamus superciliosus</i>	White-browed Woodswallow	
<i>Artamus cinereus</i>	Black-faced Woodswallow	x
<i>Artamus minor</i>	Little Woodswallow	x
<i>Cracticus torquatus</i>	Grey Butcherbird	
<i>Cracticus nigrogularis</i>	Pied Butcherbird	
<i>Gymnorhina tibicen</i>	Australian Magpie	
Family: CORVIDAE	Crows and Ravens	
<i>Corvus bennetti</i>	Little Crow	
<i>Corvus orru</i>	Torresian Crow	x
Family: ALAUDIDAE	Bushlark	
<i>Mirafra javanica</i>	Singing Bushlark	
Family: MOTACILIDAE	Wagtails and	
<i>Anthus novaeseelandiae</i>	Richard's Pipit	x
Family: PASSERIDAE	Finches and Manikins	
<i>Taeniopygia guttata</i>	Zebra Finch	x

<i>Emblema picta</i>	Painted Finch	x
Family: HIRUNDINIDAE	Swallows and Martins	
<i>Cheramoeca leucosternum</i>	White-backed Swallow	x
<i>Hirundo neoxena</i>	Welcome Swallow	x
<i>Hirundo nigricans</i>	Tree Martin	
<i>Hirundo ariel</i>	Fairy Martin	x
Family: SYLVIIDAE	Songlarks and Allies	
<i>Eremiornis carteri</i>	Spinifexbird	
<i>Cinclorhamphus mathewsi</i>	Rufous Songlark	
<i>Cinclorhamphus cruralis</i>	Brown Songlark	

Table 5 Mammals that are expected to occur in the study area

Those indicated by (x) were recorded during the July survey. x* - old diggings, believed to be from the Greater Bilby, were recorded during the July 2006 visit, although no individuals were observed.

(Int.) indicates introduced species. Other codes relate to conservation significance and are explained in Appendix 1.

SCIENTIFIC NAME	COMMON NAME	Status
Family: TACHYGLOSSIDAE	Echidna	
<i>Tachyglossus aculeatus</i>	Echidna	
Family: DASYURIDAE	Carnivorous Marsupials	
<i>Antechinomys laniger</i>	Kultarr	
<i>Dasyercus cristicauda</i>	Mulgara	VU
<i>Dasykaluta rosamondae</i>	Little Red Kaluta	x
<i>Planigale ingrami</i>	Long-tailed Planigale	
<i>Sminthopsis macroura</i>	Stripe-faced Dunnart	
<i>Sminthopsis youngsoni</i>	Lesser Hairy-footed Dunnart	
Family: THYLACOMYIDAE	Bilbies	
<i>Macrotis lagotis</i>	Bilby, Dalgyte	VU, x*
Family: NOTORYCTIDAE	Marsupial Moles	
<i>Notoryctes caurinus</i>	Northern Marsupial Mole	EN
Family: MACROPODIDAE	Kangaroos and Allies	
<i>Lagorchestes conspicillatus leichardti</i>	Spectacled Hare-wallaby	P3
<i>Macropus robustus erubescens</i>	Euro, Biggada	
<i>Macropus rufus</i>	Red Kangaroo, Marlu	
Family: EMBALLONURIDAE	Sheath-tail Bats	
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheathtail-bat	
<i>Taphozous hilli</i>	Hill's Sheathtail-bat	x
Family: VESPERTILIONIDAE	Evening Bats	
<i>Chalinolobus gouldii</i>	Gould's Wattled Bat	x
<i>Nyctophilus geoffroyi</i>	Lesser Long-eared Bat	
<i>Scotorepens balstoni</i>	Inland Broad-nosed Bat	
<i>Scotorepens greyii</i>	Little Broad-nosed Bat	
Family: MOLOSSIDAE	Free-tail bats	
<i>Chaerephon jobensis</i>	Northern Freetail-bat	
<i>Mormopterus beccarii</i>	Beccari's Freetail-bat	
<i>Tadarida australis</i>	White-striped Freetail-bat	
Family: MURIDAE	Rodents	
<i>Mus musculus</i>	House Mouse	Int.
<i>Notomys alexis</i>	Spinifex Hopping-mouse	
<i>Pseudomys chapmani</i>	Pilbara Pebble-mound Mouse	P4
<i>Pseudomys desertor</i>	Desert Mouse	x
<i>Pseudomys hermannsburgensis</i>	Sandy Inland Mouse	x
Family: LEPORIDAE	Rabbits	
<i>Oryctolagus cuniculus</i>	Feral Rabbit	Int.

Family: CANIDAE	Dogs	
<i>Canis familiaris dingo</i>	Dingo	x
<i>Vulpes vulpes</i>	Red Fox	Int.
Family: FELIDAE	Cat	
<i>Felis catus</i>	Feral Cat	Int.
Family: EQUIDAE	Horses and Donkeys	
<i>Equus asinus</i>	Feral Donkey	Int.
Family: CAMELIDAE	Camels	
<i>Camelus dromedarius</i>	Feral Dromedary, Camel	x, Int.

Table 6 Extinct fauna that were previously expected to occur in the study area

This includes species that are considered completely extinct, extinct on the mainland and those species that have experienced a contraction in range. Status codes relate to conservation significance and are explained in Appendix 3.

SCIENTIFIC NAME	COMMON NAME	Status
Family: DASYURIDAE	Carnivorous Marsupials	
<i>Dasyurus geoffroii</i>	Western Quoll, Chuditch	VU
<i>Phascogale calura</i>	Red-tailed Phascogale	EN
Family: PERAMELIDAE	Bandicoots	
<i>Chaeropus ecaudatus</i>	Pig-footed Bandicoot	EX
<i>Isoodon auratus auratus</i>	Golden Bandicoot	VU
<i>Perameles eremiana</i>	Desert Bandicoot	EX
Family: THYLACOMYIDAE	Bilbies	x
<i>Notaden nicholli</i>		
<i>Macrotis leucura</i>	Lesser Bilby	EX
Family: POTOROIDAE	Bettongs	
<i>Bettongia lesueur graii</i>	Burrowing Bettong, Boodie	VU
<i>Bettongia penicillata ogilbyi</i>	Brush-tailed Bettong, Woylie	P5
Family: MACROPODIDAE	Kangaroos and Allies	
<i>Lagorchestes asomatus</i>	Central Hare-wallaby	EX
<i>Lagorchestes hirsutus hirsutus</i>	Rufous Hare-wallaby	EN
<i>Onychogalea lunata</i>	Crescent Nailtail Wallaby, Wurrung	EX
Family: MURIDAE	Rodents	
<i>Pseudomys fieldi</i>	Shark Bay Mouse	VU
<i>Rattus tunneyi</i>	Pale Field-rat	



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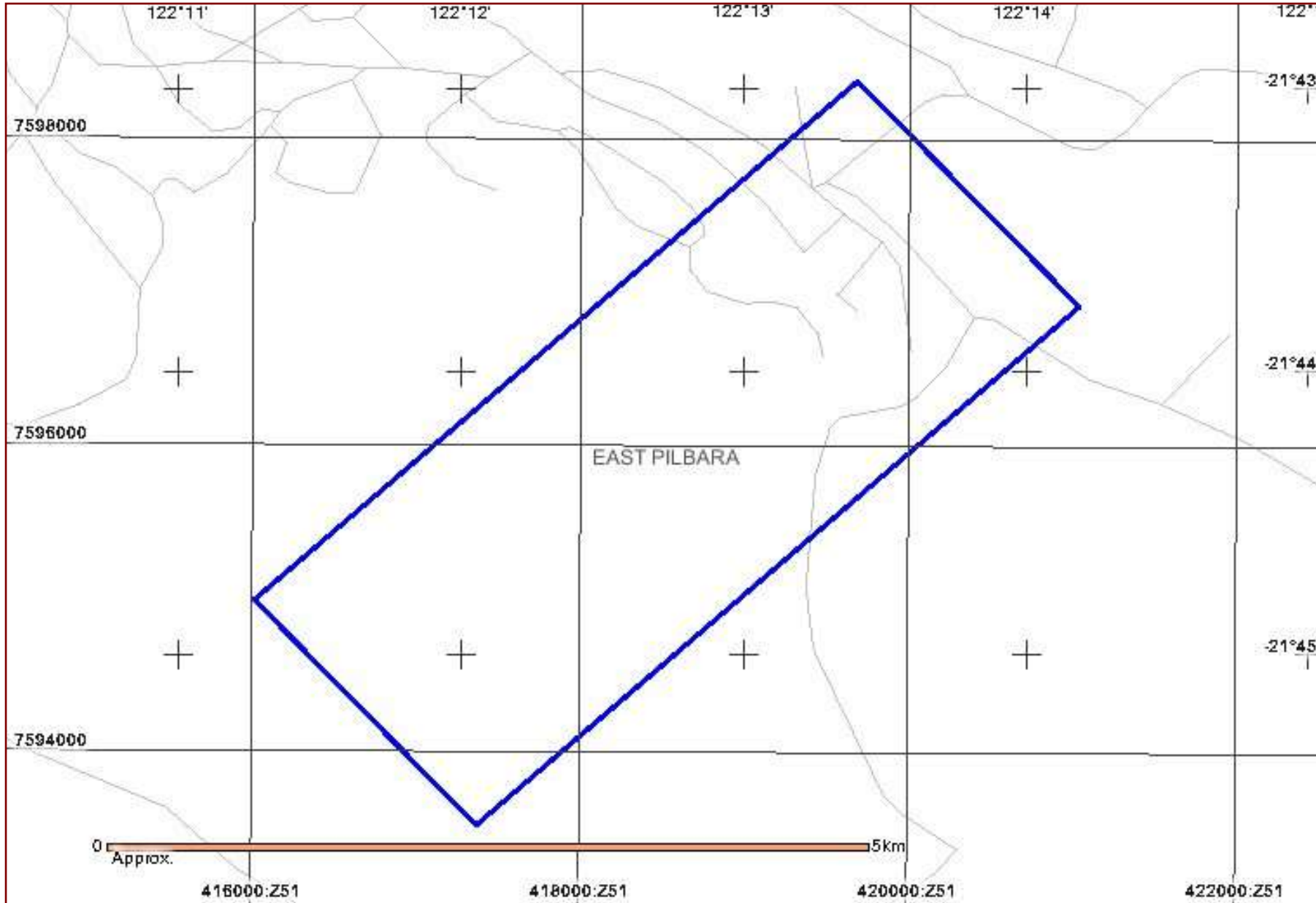
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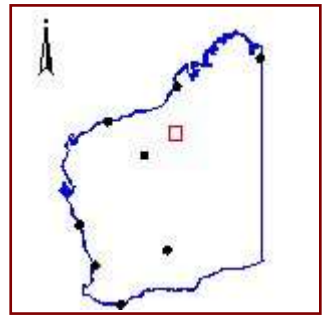
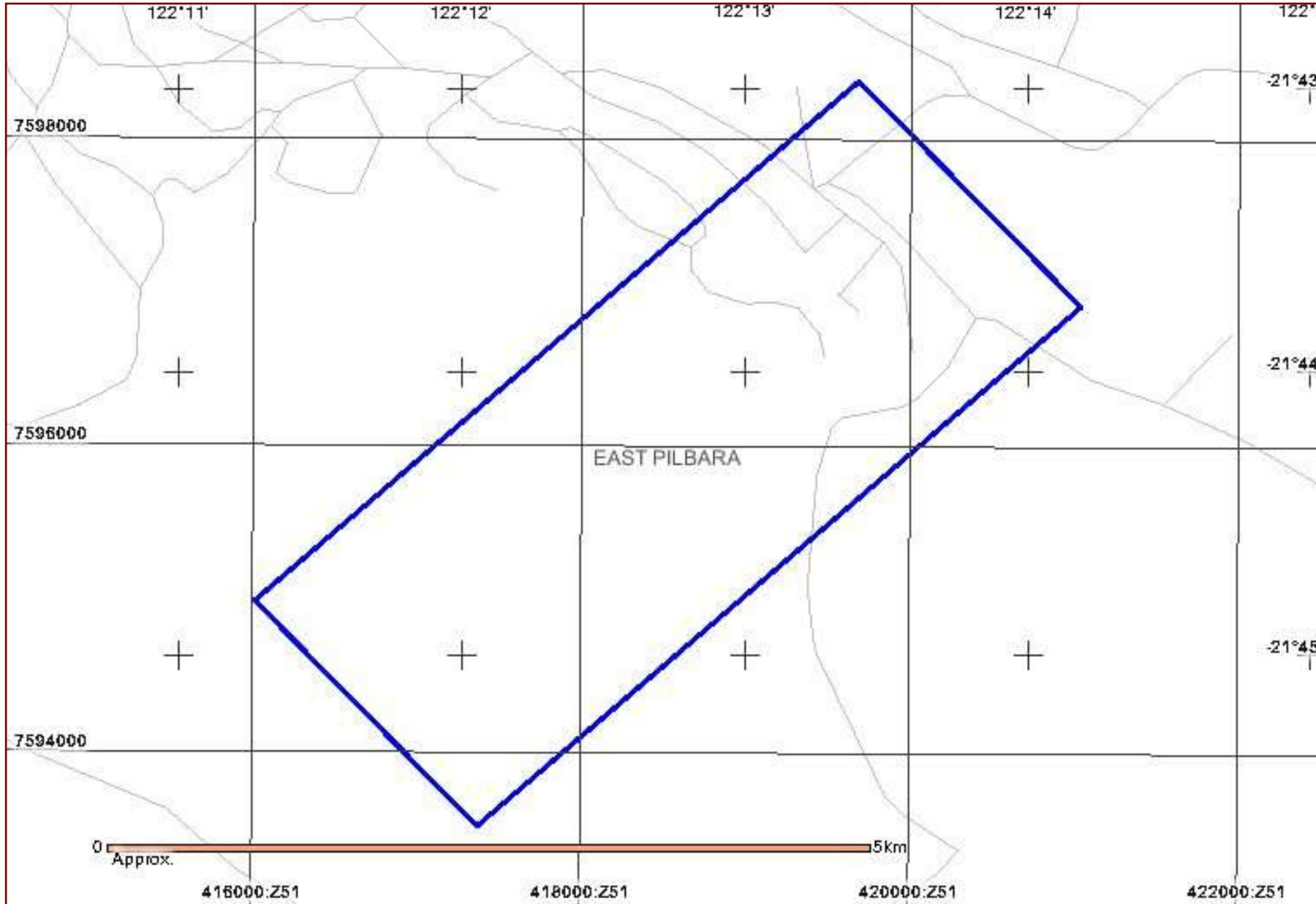
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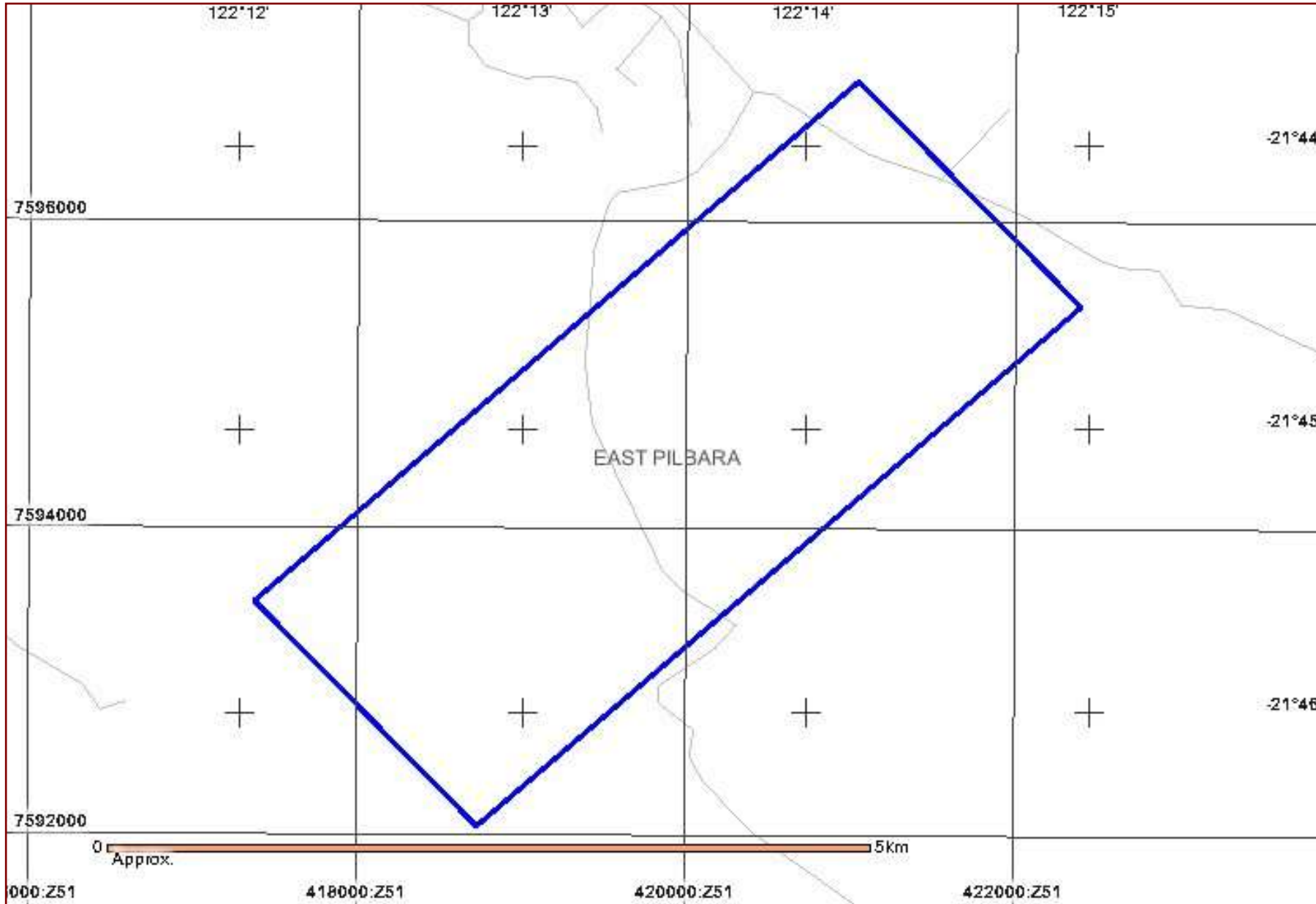
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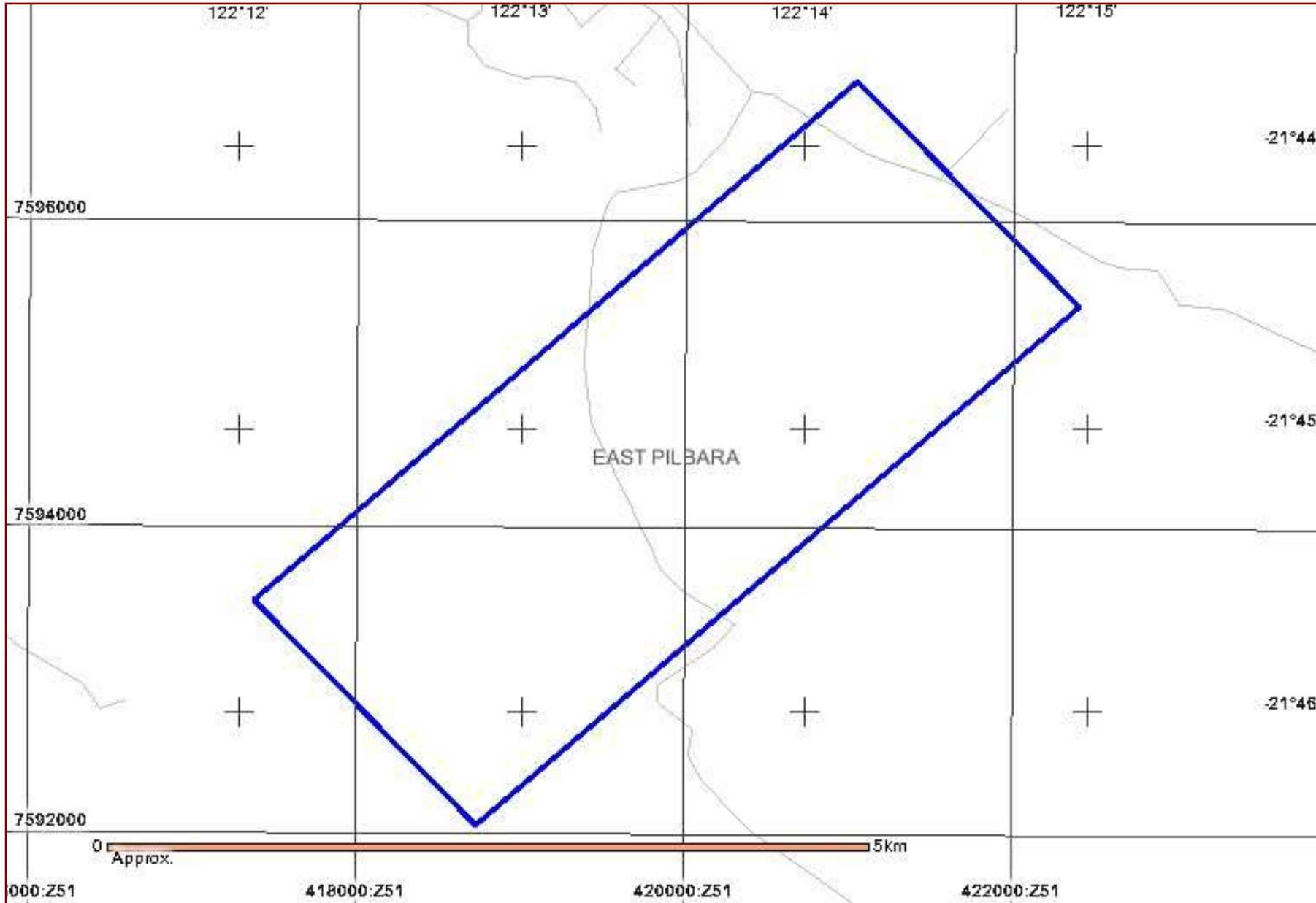
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