

Main Roads WA

Report for Tanami Road,
Carranya Section Stage 2 (SLK
132 - 156)

Preliminary Environmental
Impact Assessment

May 2009



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Executive Summary

Main Roads Western Australia (MRWA) commissioned GHD Pty Ltd (GHD) to complete a Preliminary Environmental Impact Assessment (PEIA) associated with the proposed upgrade of approximately 24 km of Tanami Road (SLK 132-156).

A number of desktop assessments were undertaken to determine the potential environmental impacts of the proposed works. These included identification and reporting of:

- » Climate;
- » geology,
- » hydrology,
- » vegetation and flora;
- » fauna;
- » indigenous heritage;
- » non-indigenous heritage;
- » land use;
- » visual amenity; and
- » construction phase impacts.

No issues identified during the development of this PEIA are considered to require referral to the Environmental Protection Authority or the Commonwealth.

The study area is approximately 484 hectares (474 ha along Tanami road and 10ha borrow pits) however only a portion of this amount will be required to be cleared. The project is unlikely to be at variance with the Ten Clearing Principles. The conditions stipulated in Main Roads WA state-wide vegetation clearing permit (Purpose Permit CPS 818/4) should be adhered to.



1. Introduction

Main Roads Western Australia (Main Roads WA) in conjunction with the Shire of Halls Creek has commissioned GHD Pty Ltd (GHD) to complete a Preliminary Environmental Impact Assessment (PEIA) for the proposed upgrade of the Carranya section of Tanami Road. The road section proposed for upgrade is located between SLK 132 and SLK 156 and is situated north from the access road to Billiluna community.

1.1 Scope of report

This PEIA has been prepared to conform to Main Roads Consultant Brief. It:

- » Identifies and reviews existing relevant environmental reports;
- » Conducts an initial assessment to determine the key environmental aspects for the road proposal;
- » Assesses the project against the *Environmental Protection Act's (1986)* 10 Clearing Principles (Schedule 5);
- » Assesses environmental aspects likely to require referral of the project and advises whether the project should be referred to the Environmental Protection Authority (EPA);
- » Assesses all Matters of National Environmental Significance likely to require referral of the project to the Commonwealth Department of Environment, Water, Heritage and the Arts;
- » Consult with relevant government agencies as required;
- » Determines (but does not apply for) clearances required under other legislative provisions, including (but not limited to) those required under the following Acts:
 - *Conservation and Land Management Act (1984)*;
 - *Wildlife Conservation Act (1950)*;
 - *Environmental Protection Act (1986)*;
 - *Rights in Water and Irrigation Act (1914)*;
 - *Heritage of Western Australia Act (1990)*;
 - *Aboriginal Heritage Act (1972)*

Based on the information provided by Main Roads WA and database/literature reviews, the environmental and social aspects considered and discussed in this PEIA include:

- Climate;
- geology,
- hydrology,
- vegetation and flora;
- fauna;
- indigenous heritage;
- non-indigenous heritage;



- land use;
- visual amenity; and
- construction phase impacts.

1.2 Structure of Report

This PEIA has been structured as follows:

- » Section 2: Outlines the project.
- » Section 3: Environmental and social issues considered relevant to this Project are outlined on a topic-by-topic basis. Each of the topics includes a baseline environmental description. This is followed by a preliminary assessment of potential environmental constraints and GHD's recommendation to Main Roads WA.
- » Section 4: Discusses the need for referral, to the EPA, the commonwealth, and approvals that may be required by the proposed project.
- » Section 5: Draws conclusions from the preliminary EIA and reiterates the management recommendations provided in Section 3.



2. Project Description and Justification

2.1 Project description

The project involves the upgrade of approximately 24km of Tanami Road, south of Halls Creek located between SLK 132 – 156. The upgrade consists of road formation, gravel sheeting and drainage improvements.

Clearing of remnant native vegetation will occur for:

- » the removal of borrow and gravel material for embankment and gravel resheeting of the existing gravel road.
- » Road widening, establishment of a temporary side track for traffic diversion and the establishment of offshoot drains.

The proposed works will improve the road condition, provide increased serviceability, reduce maintenance and freight cost and improve the level of serviceability available to the local community.

2.2 Study area

The study area is shown in Figure 1 and consists of a 100 meter wide corridor on the left and right hand side of Tanami Rd between SLK 132 – 156. In addition to the corridor the study area includes four material investigation areas. These areas will be investigated to locate naturally occurring gravel material. Not all of the areas will be required to be cleared and excavated.



3. Environmental Aspects and Management

The environmental and social issues considered relevant to this Project are outlined on a topic-by-topic basis in the following section. Each of the topics includes a baseline environmental description, and where appropriate this is followed by a preliminary assessment of potential environmental constraints and GHD's recommendation to Main Roads WA.

3.1 Climate

The Kimberley region of Western Australia has a tropical monsoon climate with two dominant seasons, separated by short transitional periods, broadly described as dry hot tropical and semi-arid with summer rainfall.

Over the months of November to April, hot and humid conditions prevail, characterising the 'wet' season. The region receives approximately 90% of its rainfall during these months, as unstable low pressure systems dominate the weather patterns.

From May to October, high pressure systems and a predominantly south easterly airflow from the continent's interior bring sunny days with cooler day time and night time temperatures. Rainfall during these months is markedly absent characterising this period as the 'dry' season.

The Bureau of Meteorology weather stations located nearest to the study areas is at Balgo Hills. Recorded climatic data is summarised below:

» Mean Daily Maximum Temperature:	26°C (June) – 38.7°C (Nov/Dec/Jan)
» Mean Daily Minimum Temperature:	12.3°C (June) – 25.2°C (Jan)
» Mean Annual Rainfall:	348.4 mm
» Mean Annual Rain Days:	28.6 days

(Source: BOM, 2008)

3.2 Geology

The project area is located within the Canning geological region. The Australian Soil Resource Information System (ASRIS) describes the landforms of this region as low dissected plateaus; mesas and buttes; stony plains; dune fields; sand plains; salt lake systems in south. The soils can be described as Saprolite (> 50%), colluvial sediments (20 - 50%).

3.2.1 Acid Sulphate Soils (ASS)

ASRIS indicates there is an extremely low probability of occurrence (ASRIS 2009). Soil descriptions indicate that some colluvial sediments may be present, however all borrow pits are located a distance from creek lines and it is not anticipated that deep excavation will be required.

ASS is not considered a constraint for this project.



3.3 Contaminated Land

A search of DEC's Contaminated Sites Database indicates there are no contaminated sites within or in close proximity to the project area.

The project area and surrounding lands are undeveloped thus it is unlikely that potentially contaminating activities have occurred on this land.

3.4 Hydrology

3.4.1 Wetlands

Waterways and wetland areas within the Kimberley region are ephemeral, and typically flow or fill during seasonal rainfall events. A search of the Western Australian Wetlands Database (*WetlandBase*) and the *EPBC Act* Protected Matters Search Tool indicate there are no significant wetlands within a close proximity to the study area.

No wetlands will be impacted by the proposed works.

3.4.2 Drainage

Seasonal rainfall causes extensive sheetflow flooding over the flat landscape and often creates ephemeral, dendritic drainage lines and rivers with extensive floodplain areas. The often sandy nature of these drainage lines makes them susceptible to erosion.

The northern tip of the study area is adjacent to a small drainage line, a tributary of Sturt Creek. Sturt Creek is located approximately 3km east of the study area.

Construction works have the potential to cause erosion and increased flooding. These impacts can be managed through engineering design and formulation of a Construction Environmental Management Plan (CEMP). In particular, no laydown areas should be placed within 50m of the drainage line in order to reduce the risk of pollution from potential spills.

3.4.3 Groundwater

A search of the Department of Water (DoW) Geographic Data Atlas indicated that the project is not within any Gazetted Public Drinking Water Source Areas, but it does lie within the Canning-Kimberley Groundwater Area. The Canning-Kimberley Groundwater Area covers the entire Kimberley sub-region. It was proclaimed in 1997 under the *Rights in Water and Irrigation Act 1914* to ensure groundwater is abstracted sustainably.

The *Act* gives the DoW the power to manage ground and surface areas and use of land that may impact upon these water sources. Permits are required to allow obstruction or interference with the bed or banks of a watercourse to which there is access by a public road or reserve.

Where dewatering, obstruction of groundwater or modification of stream banks is required for roadworks, Main Roads will need to complete the relevant application form as indicated below:

- » For dewatering – 'Application for a 5C License to take Groundwater' (Form A); and



- » For modifying beds and banks – ‘Application for a 5C license to take surface water / Application for a 11/17/21 A permit to modify bed and banks / Application to amend a 11/17/21A permit to modify bed and banks’ (Form C).

3.5 Vegetation and Flora

3.5.1 Vegetation Types

The survey area is located where two biogeographic regions meet. The majority of the study area is within the Ord Victoria Plains 2 (OVP2 – South Kimberley Interzone subregion).

Vegetation of the Kimberley Region has been surveyed, mapped and described by Beard (1979) and is summarised in Wheeler (1992). The study area is situated on the southern border of the Hall phytogeographic district and the Great Sandy Desert. Broad scale vegetation for the Halls district have been summarised below:

- » The predominant vegetation is shrub steppe or tree steppe. The grass layer is dominated by *Triodia* species
- » Tree steppe has occasional to sparse trees of *Eucalyptus* species.
- » Shrub steppe has occasional shrubs of species *Acacia*, *Grevillea* and *Hakea*.
- » In the Osmond range and the Ord plains there are areas of tree savannah. The tree layer dominated by *Eucalyptus* species and the grass layer by *Aristida* and *Chrysopogon* species
- » Cracking clay plains support a treeless grass savannah dominated by *Astrebla* species

The southern end of the study section is within the Great Sandy Desert (GSD 1 McLarty subregion).

In 2001-2 the (then) Department of Conservation and Land Management undertook an extensive audit of the State’s terrestrial biodiversity. Detailed information for the State’s biogeographic subregions was collated at this time. The environment of these subregions is described in the Biodiversity Audit of Western Australia’s 53 Biogeographical Subregions (Graham, 2001a; 2001b) and the vegetation types described for the survey area are included below:

OVP2 – South Kimberley Interzone subregion

- » Grassland with scattered bloodwoods (*Eucalyptus* spp.) and Snappy Gum (*Eucalyptus brevifolia*) (Graham, 2001b)

GSD 1 McLarty subregion

- » Tree steppe; comprising open hummock grassland of *Triodia pungens* and *Triodia schinzii* with scattered trees of *Owenia reticulata* and Bloodwoods, 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.

- » 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.

3.5.2 Vegetation Extents

A vegetation type is considered underrepresented if there is less than 30 percent of its original distribution remaining. From a purely biodiversity perspective, and not taking into account any other land degradation issues, there are several key criteria now being applied to vegetation (EPA, 2000):

- » The “threshold level” below which species loss appears to accelerate exponentially at an ecosystem level is regarded as being at a level of 30% of the pre-European/pre-1750 extent of the vegetation type;
- » A level of 10% of the original extent is regarded as being a level representing *Endangered*; and
- » Clearing which would put the threat level into the class below should be avoided.

Such status can be delineated into five (5) classes, where:

- » *Presumed Extinct*: Probably no longer present in the bioregion
- » *Endangered**: <10% of pre-European extent remains
- » *Vulnerable**: 10-30% of pre-European extent exists
- » *Depleted**: >30% and up to 50% of pre-European extent exists
- » *Least Concern*: >50% pre-European extent exists and subject to little or no degradation over a majority of this area.

* or a combination of depletion, loss of quality, current threats and rarity gives a comparable status

Native vegetation types represented in the study area; their extent and reservation status are drawn from Shepherd, *et al.* (2002), and Shepherd pers. comm. These are shown in Table 1.

Table 1 Vegetation extent and status.

Vegetation Association Number	Association Description	Pre-European Extent (Ha)	Current Extent (Ha)	% Remaining
849	Hummock grasslands, low tree steppe; snappy gum & bloodwood over soft spinifex	481753	481753	100

Generally the vegetation extents would be considered within the IBRA region of the study area but as the current study area crosses IBRA regions the extents for the whole of state were considered. In this case, the percentages remaining for the whole of state, the Ord Victoria Plain and the Great Sandy Desert IBRA extents are equivalent.



The extent of the vegetation in the study area is considered intact, with approximately 100% of the pre-European extents of each vegetation type remaining.

Vegetation type does not pose a constraint on clearing.

3.5.3 Threatened Ecological Communities

A search was undertaken of the DEC's Threatened Ecological Community (TEC) database and found no known occurrences of TECs recorded within the vicinity of the study area.

3.5.4 Environmentally Sensitive Areas

The DEC's online Native Vegetation Viewer was searched to determine the location of any Environmentally Sensitive Areas (ESAs). The search confirmed that there are no ESA's within or in close proximity to the study area

3.5.5 Declared Rare and Priority Flora

Species of significant flora are protected under both State and Commonwealth Legislation.

Commonwealth

Any activities that are deemed to have a significant impact on species that are recognised by the *EPBC Act*, and the *Wildlife Conservation Act 1950* can trigger referral to the Department of the Environment, Water, Heritage and the Arts and/or the EPA.

A description of Conservation Categories delineated under the *EPBC Act* is detailed in, Table 6. These are applicable to threatened flora and fauna species.

A search of the *EPBC Act* Protected Matters Search Tool identified no Commonwealth protected flora species likely to occur within 10km of the project area.

State

In addition to the *EPBC Act*, significant flora in Western Australia is protected by the *Wildlife Conservation Act 1950*. This Act, which is administered by the DEC, protects Declared Rare Flora (DRF) species. The DEC also maintains a list of Priority Listed Flora (PLF) species. Conservation codes for flora species are assigned by the DEC to define the level of conservation significance. PLF are not currently protected under the *Wildlife Conservation Act 1950*. PLF may be rare or threatened, but cannot be considered for declaration as rare flora until adequate surveys have been undertaken of known sites and the degree of threat to these populations clarified. Special consideration is often given to sites that contain PLF, despite them not having formal legislative protection. A description of the DEC's Conservation Codes that relate to flora species is provided in Table 7.

A search of the DEC's Rare Flora Databases and the Western Australian Herbarium (WAHERB) records was performed for a 10km buffer of the survey area. These species are outlined in Table 2.

Table 2 Significant Flora Records within a 10km buffer of the project area.

Species	Conservation Code	Description (Florabase)
<i>Crotalaria smithiana</i>	P1	Annual, herb, to 0.4 m high. Fl. yellow, Jun. Regeneration site on floodplain.
<i>Goodenia crenata</i>	P3	Prostrate, rosetted herb, to 0.1 m high. Fl. yellow, May–Jul. Fine red earth, red clay. Flat sandplains, sandstone outcrops.
<i>Goodenia modesta</i>	P3	Herb, to 0.5 m high. Fl. yellow, Jan–Dec. Red loam, sand.
<i>Goodenia strangfordii</i>	P1	Erect, diffuse herb, to 0.3 m high. Fl. yellow. Heavy & seasonally wet soils.
<i>Goodenia suffrutescens</i>	P1	Perennial, herb or shrub, to 1 m high. Fl. blue, Jun–Aug. Lateritic pavement.
<i>Indigofera ammobia</i>	P3	Many-stemmed shrub, to 0.5 m high. Fl. green, purple, Sep. Red sand. Sand dunes.
<i>Kohautia australiensis</i>	P2	Erect sparsely or much-branched annual, herb, 0.1–0.5 m high. Fl. blue.
<i>Teucrium</i> sp. Sturt Creek (A.A. Mitchell 5536)	P1	Rhizomatous, perennial, herb, 0.2 m high. Black soil. Large crab holes.
<i>Trachymene dusenii</i>	P3	Erect perennial, herb, 0.6–1 m high. Fl. white, yellow, May–Jul.

Two priority 1 species ; *Goodenia strangfordii* and *Goodenia suffrutescens* are known to occur approximately 1km south of the project area. The location of significant flora is presented in Figure 1.

3.5.6 Plant Pathogens and Weeds

In WA dieback is found in the south-west in areas receiving more than 400 mm annual rainfall. It does not occur within the study area.

Through out-competing, weeds threaten the survival of many native plants and animals, having an effect on biodiversity. The occurrence and extent of weeds within the project area are likely to be low given the projects isolated location however with any clearing of native vegetation there is potential for spread of weeds.

Weed management strategies should be applied during construction to prevent spread. Follow up assessments should occur post construction as part of the CEMP.

3.5.7 Clearing of Native Vegetation

It is estimated that the study area consists of 484 hectares (474 ha along Tanami Road and 10ha borrow pits), however only a portion of this area will be required to be cleared.



Main Roads WA was issued with a statewide vegetation clearing permit (Purpose Permit CPS 818/4) granted under section 51E of the *Environmental Protection Act 1986* on the 1st February 2006 by the DEC. The Purpose Permit allows Main Roads to clear native vegetation for project activities. Any clearing of native vegetation must be assessed against the Ten Clearing Principles.

An examination of the Ten Clearing Principles associated with the project is shown in Table 3. The project does not appear to be at variance with the Ten Clearing Principles.

The conditions stipulated in Main Roads WA state-wide vegetation clearing permit (Purpose Permit CPS 818/4) should be adhered to.



Table 3 Assessment against the Ten Clearing Principles.

Principle Number	Principle	Assessment	Outcome
(a)	Native vegetation should not be cleared if it comprises a high level of biological diversity	<p>Aerial photography indicates the study area is surrounded by continuous undisturbed vegetation of similar or better condition. Since the vegetation to be cleared is located next to an existing road it is likely to contain a number of weed/disturbance species.</p> <p>Unless surveys have already been performed in a similar area, a flora survey would need to be performed to gain a reliable estimate of biodiversity.</p>	The proposal is unlikely to be at variance with the Principle.
(b)	Native vegetation should not be cleared if it comprises the whole or part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.	<p>The EPBC and the Threatened Fauna database have indicated a number of significant species occur in the general vicinity of the project area. Of the significant species listed the Bilby, Spectacled Hare-wallaby and Mulgara species are considered to have the greatest potential of occurring within the study area. A fauna survey would be required to determine the likelihood of these species utilising the area.</p> <p>While the proposed study area is large (484ha) the nature of the clearing is linear. With the exception of the Bilby, identified significant fauna likely to occur in the area would be flushed from the surrounding vegetation during any disturbance activities.</p> <p>Additionally the intact uniformity of the surrounding vegetation makes it unlikely that the vegetation to be cleared is significant for fauna indigenous to Western Australia.</p>	The proposal is unlikely to be at variance with the Principle.



Principle Number	Principle	Assessment	Outcome
(c)	Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.	A desktop assessment has identified that the area to be cleared does not contain any Declared Rare Flora or Priority Flora. Two priority one species <i>Goodenia strangfordii</i> and <i>Goodenia suffrutescens</i> are located approximately 1km south of the project area.	The proposal is unlikely to be at variance with the Principle.
(d)	Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a Threatened Ecological Community.	There are no known records of TECS within, or in the vicinity, of the study area.	The proposal is unlikely to be at variance with the Principle.
(e)	Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.	<p>The study area is surrounded by a large expanse of native vegetation.</p> <p>The extent and status of vegetation identified for the study area by Shepherd has indicated that:</p> <p>100% of the pre-European extent is remaining for both the state and IBRA regions indicating the vegetation type is widespread and largely intact.</p>	The proposal is unlikely to be at variance with the Principle.
(f)	Native vegetation should not be cleared if it is growing in or in association with a watercourse or wetland.	<p>There are no wetlands within the study area. A small ephemeral drainage line is adjacent to the northern extent of the study area.</p> <p>The project is unlikely to involve clearing of vegetation associated with this drainage line.</p>	The proposal is unlikely to be at variance with the Principle.



Principle Number	Principle	Assessment	Outcome
(g)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	<p>The clearing of native vegetation may cause slight alterations to the adjacent lands. Runoff, sedimentation, erosion and weed dispersal may increase slightly but will be very unlikely to cause appreciable land degradation.</p> <p>Potential impacts can be mitigated by appropriate management measures.</p>	The proposal is unlikely to be at variance with the Principle.
(h)	Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.	No conservation areas were identified during the desktop assessment.	The proposal is unlikely to be at variance with the Principle.
(i)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.	<p>The potential clearing of remnant native vegetation is not likely to cause deterioration in the quality of surface or underground waters. The amount of vegetation required to be cleared is minimal compared to the remaining vegetation within and adjacent to the survey area.</p> <p>Clearing on the northern tip of the study area occurs adjacent to a waterway. This should be appropriately managed to prevent any potential impacts, such as erosion and sedimentation.</p>	The proposal is unlikely to be at variance with the Principle.
(i)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the intensity of flooding.	The clearing of native vegetation may cause increased runoff. However flooding is a natural event in the Kimberley region, occurring each wet season, This project is not considered likely to cause or exacerbate the incidence or intensity of flooding events.	The proposal is unlikely to be at variance with the Principle.

3.6 Fauna

The conservation of fauna species and their significance status is currently assessed under both State and Commonwealth Acts. The acts include the Western Australian *Wildlife Conservation Act 1950*, *Wildlife Conservation (Specially Protected Fauna) Notice 2003*, and the *EPBC Act*.

Significance levels for fauna within the *EPBC Act* are the same as those recommended by the International Union for the Conservation of Nature and Natural Resources (IUCN). The *Wildlife Conservation Act 1950* utilises a set of Schedules as well as some of the IUCN categories. These categories and Schedules are described in Table 8, Appendix C.

The DEC also produces a supplementary list of Priority Fauna, being species that are not considered Threatened under the Western Australian *Wildlife Conservation Act 1950* but for which the Department feels there is a cause for concern. These species have no special protection, but their presence would normally be considered. Levels of Priority are described in Table 9, Appendix C.

The DEWHA maintains a database of matters of national environmental significance that are protected under the EPBC Act. An EPBC Act Protected Matters Report was generated for the matters of significance that may occur in, or may relate to, the survey area. A search of the DEC's Threatened Fauna database for any rare and priority species that may occur in the survey area was also undertaken. From the DEC and DEWHA databases, a number of protected fauna species were identified as potentially occurring within the project area (Table 4).

It should be noted that some species that appear in the EPBC Act Protected Matters Search Tool are often not likely to occur within the specified area, as the search provides an approximate guidance to matters of national significance that require further investigation. The records from the DEC searches of threatened fauna provide more accurate information for the general area; however some records of sightings or trappings can be dated and often misrepresent the current range of threatened species.



Table 4 Threatened fauna occurring, or likely to occur, in the survey area as indicated by the EPBC Act Protected Matters Search Tool and the DEC's Rare Fauna Database search.

				Conservation Status	
Family	Genus	Species	Common Name	EPBC Act	DEC
Birds					
Apodidae	<i>Apus</i>	<i>pacificus</i>	Fork-tailed Swift	Migratory, Marine	
Ardeidae	<i>Ardea</i>	<i>alba</i>	Great Egret, White Egret	Migratory, Marine	
Ardeidae	<i>Ardea</i>	<i>ibis</i>	Cattle Egret	Migratory, Marine	
Charadriidae	<i>Charadrius</i>	<i>veredus</i>	Oriental Plover, Oriental Dotterel	Migratory, Marine	
Glareolidae	<i>Glareola</i>	<i>maldivarum</i>	Oriental Pratincole	Migratory, Marine	
Meliphagidae	<i>Merops</i>	<i>ornatus</i>	Rainbow Bee-eater	Migratory	
Scolopacidae	<i>Numenius</i>	<i>minutes</i>	Little Curlew, Little Whimbrel	Migratory, Marine	
Mammals					
Dasyuridae	<i>Dasyercus</i>	<i>cristicauda</i>	Mulgara	Vulnerable	Schedule 1
Dasyuridae	<i>Dasyercus</i>	<i>blythi</i>	Brush-tailed Mulgara, Ampurta		Priority 4
Macropodidae	<i>Lagorchestes</i>	<i>conspicillatus leichardti</i>	Spectacled Hare-wallaby (mainland)		Priority 3
Notoryctidae	<i>Notoryctes</i>	<i>caurinus</i>	Karkarratul, Northern Marsupial Mole	Endangered	Schedule 1
Notoryctidae	<i>Notoryctes</i>	<i>typhlops</i>	Southern Marsupial Mole, Itjaritjari	Endangered	Schedule 1



					Conservation Status
Family	Genus	Species	Common Name	EPBC Act	DEC
Thylacomyidae	<i>Macrotis</i>	<i>lagotis</i>	Bilby, Dalgyte, Ninu	Vulnerable	Schedule 1
Reptiles					
Agamidae	<i>Cryptagama</i>	<i>aurita</i>	-		Priority 1
Scincidae	<i>Egernia</i>	<i>kintorei</i>	Giant Desert Skink	Vulnerable	Schedule 1



3.6.1 Fauna Habitat

The EPBC and the Threatened Fauna database have indicated a number of significant species occur in the general vicinity of the project area. To accurately determine the likelihood of these species utilising the project area a field fauna survey would be required.

Of the significant species listed it is considered unlikely that the Southern and Northern Marsupial Mole and Giant Desert Skink will inhabit the project area. The Priority 1 species *Cryptagama aurita* is a very poorly known lizard, with only three specimens previously found. The Bilby, Spectacled Hare-wallaby and Mulgara species have the greatest potential of occurring within the study area. These species are mobile and if within the project area could relocate to surrounding habitat.

Though there is potential for threatened fauna to be within the vicinity of the project area, the linear nature of the study area and the intact uniformity of the surrounding vegetation makes it unlikely that the vegetation provides significant habitat for fauna indigenous to Western Australia.

3.7 Surrounding Land Use

The study area is isolated, surrounded by undeveloped remnant vegetation. The closest community is the Billiluna Aboriginal Community located approximately 1.5km South.

3.8 Reserves and Conservation Areas

There are no reserves or conservation areas within the project area.

3.9 Australian Heritage

3.9.1 Non-Indigenous Heritage

An *Environment Protection and Biodiversity Conservation Act 1999* Protection Matters search was conducted and did not identify any Commonwealth lands, Commonwealth Heritage Places or Registered National Estate places within an area that may be affected by the proposed project. A search of the Australian Heritage Database and the WA Heritage Council database identified no state or municipal heritage sites within or adjacent to the project area.

3.9.2 Indigenous Heritage

The Aboriginal Site Register is held under the *Aboriginal Heritage Act (1972)*. It protects places and objects customarily used by, or traditional to, the original inhabitants of Australia.

A search of the Department of Indigenous Affairs Aboriginal Heritage Register has identified no registered sites within the project area.

A number of aboriginal sites are located within the vicinity of the study area, these sites are presented in Figure 1.

In addition, it should be noted that a search under the DIA database does not comprise of a full assessment under the *Aboriginal Heritage Act* (1972). This would require consultation with Aboriginal people with knowledge of the area (usually, but not necessarily Native Title Claimants), and an archaeological survey.

Under the *Aboriginal Heritage Act* (1972), it is an offence to disturb an Aboriginal heritage site whether it is registered or not. The proponent should be made aware of this in any decision making with respect to whether they should proceed to a full Aboriginal site assessment.

No sites are expected to be impacted by the proposed works however there is the potential that material of significance to Aboriginal people is discovered or uncovered during the project. Requirements for management of such items are bound by the *Aboriginal Heritage Act* as follows:

- » If any human skeletal material is uncovered, work shall cease within 20 m of the material and it shall be reported to the Police as soon as possible;
- » If any artefacts or material of apparent Aboriginal origin is discovered, work shall cease within 20 m of the material and the Project Manager shall acquire the services of a qualified archaeologist to investigate the material and take the appropriate actions.

3.9.3 Native Title

A search of the Native Title Tribunal, Western Australian Native Title Claim Map identified no Native Title claims over the project area.

3.10 Construction Phase Impacts

Potential impacts likely to require consideration during the construction phase of the Project include:

- » Noise and vibration
- » Dust production
- » Fire management;
- » Pollution through the use of fuels, chemicals or from general construction rubbish; and
- » Traffic management requirements

These issues will be managed through the implementation of a construction phase Environmental Management Plan (CEMP) and/or Main Roads WA standard contractual documentation.

Given the isolated nature of the study area construction phase impacts are not anticipated to pose a significant constraint to the project.



3.11 Visual Amenity

Upgrading the Tanami Road will not affect visual amenity in the long term. Material investigation areas close to the road have the potential to cause a decrease in visual amenity for road users and the local Billiluna Community. Machinery storage areas, and stockpiling of soils during works will also be a temporary source of visual impact.

Rehabilitation of the cleared areas is important to ensure that any visual and environmental impacts of the works are short term.



4. Environmental Approvals

4.1 Commonwealth Approvals

There are no environmental impacts or issues considered as having a significant impact on matters of national environmental significance, which would trigger the Commonwealth's *EPBC Act 1999*.

4.2 Government of Western Australia

4.2.1 Referral to the Environmental Protection Authority

Projects may require referral to the Environmental Protection Authority (EPA) under Part IV of the *Environmental Protection Act 1986*, if the project will have significant impacts on any of the following matters:

- » Native remnant vegetation;
- » Rare flora and fauna species and threatened communities
- » Wetlands;
- » Watercourses and rivers;
- » Estuaries and inlets
- » Coastlines and near shore marine areas;
- » Catchments with special requirements;
- » Contaminated soils;
- » Noise and vibration;
- » Public Drinking Water Source Areas – groundwater and surface water
- » Aboriginal heritage
- » European heritage; or
- » Adjacent land uses

This PEIA has found the project unlikely to cause a significant impact on any of the above factors.

It is not anticipated that this project will require referral to the EPA.

4.2.2 Clearing Permit

This desktop PEIA has found the project to be unlikely to be at variance with the Ten Clearing Principles. The conditions stipulated in Main Roads state-wide vegetation clearing permit (Purpose Permit CPS 818/4) should be adhered to.



5. Conclusions and Recommendations

The desktop assessment and review undertaken as part of this PEIA indicates that there is a minimum level of potential environmental impacts associated with the improvement of Tanami Road (SLK 132-156).

The PEIA identifies environmental and social aspects that require management, and those that were unlikely to be impacted upon. The following aspects have been investigated and are considered unlikely to be impacted upon:

- » Acid Sulphate Soils
- » Contaminated Land
- » Wetlands
- » Aboriginal Heritage
- » European Heritage
- » Fauna
- » Reserves and Conservation Areas

GHD has identified a number of environmental aspects that though not considered to pose a significant constraint will require management throughout the proposed works. Table 5 summarises the aspects identified in section 3 and advises Main Roads WA of recommendations to ensure that the proposed works occur with the least possible impact on the immediate and surrounding areas:

Table 5 Issues requiring management during proposed works

Aspect	Issue	Recommendation
Drainage	Increased run off	Potential impacts can be managed through engineering design and the preparation of a CEMP. No laydown areas should be placed within 50m of the drainage line Cleared areas should be rehabilitated after construction works have finished
	Erosion	
	Increased flooding	
Groundwater	Abstraction of groundwater	If dewatering is required Main Roads WA should obtain the appropriate licenses (Section 3.4.3)



Aspect	Issue	Recommendation
Clearing of vegetation	Removal of native vegetation	The conditions stipulated in Main Roads WA state-wide vegetation clearing permit (Purpose Permit CPS 818/4) should be adhered to
Weeds	Introduction or spread of weed species	Weed management strategies should be applied during and post construction
Visual amenity	Reduction in visual amenity for local community and drivers	Cleared areas should be rehabilitated
Construction phase impacts	Dust, Noise, Vibration, Safety and Traffic access	Managed through CEMP



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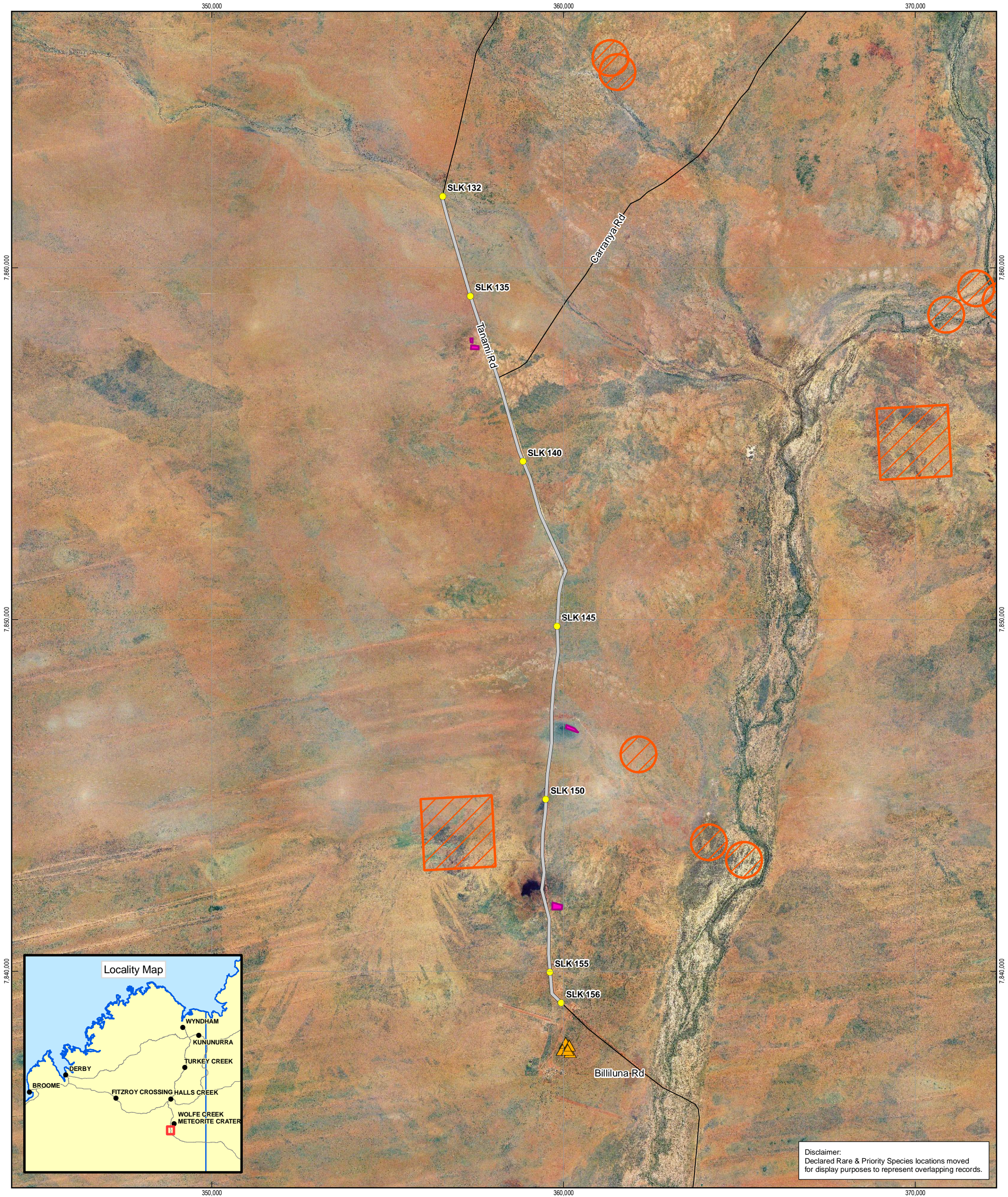
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Appendix A

Figures

Figure 1 – Locality and Environmental Constraints



LEGEND

- Tanami Road SLK (SLK 132 to SLK 156)
- Tanami Road Centreline (SLK 132 to SLK 156)
- Road Centreline
- Borrow Pits
- Aboriginal Heritage Sites

Declared Rare & Priority Species

- (R) Declared Rare Flora - Extant Taxa
- Priority 1 - Poorly Known Taxa
- Priority 2 - Poorly Known Taxa
- Priority 3 - Poorly Known Taxa
- Priority 4 - Rare Taxa



Appendix B

Flora

EPBC Act 1999 Conservation Categories

DEC Conservation Codes for Declared Rare Flora & Priority
Flora



Table 6 Environmental Protection And Biodiversity Conservation Act 1999 Categories

Conservation Category	Definition
Extinct	Taxa not definitely located in the wild during the past 50 years
Extinct in the Wild	Taxa known to survive only in captivity
Critically Endangered	Taxa facing an extremely high risk of extinction in the wild in the immediate future
Endangered	Taxa facing a very high risk of extinction in the wild in the near future
Vulnerable	Taxa facing a high risk of extinction in the wild in the medium-term
Near Threatened	Taxa that risk becoming Vulnerable in the wild
Conservation Dependent	Taxa whose survival depends upon ongoing conservation measures. Without these measures, a conservation dependent taxon would be classified as Vulnerable or more severely threatened.
Data Deficient (Insufficiently Known)	Taxa suspected of being Rare, Vulnerable or Endangered, but whose true status cannot be determined without more information.
Least Concern	Taxa that are not considered Threatened

Table 7 Conservation codes and descriptions for the DEC's Declared Rare and Priority flora species.

Conservation Code	Description
R: Declared Rare Flora – Extant Taxa	Taxa which have been adequately searched for and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such.
P1: Priority One – Poorly Known Taxa	Taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P2: Priority Two – Poorly Known Taxa	Taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P3: Priority Three – Poorly Known Taxa	Taxa which are known from several populations, and the taxa are not believed to be under immediate threat (i.e. not currently endangered), either due to the number of known populations (generally >5), or known populations being large, and either widespread or protected. Such taxa are under consideration for declaration as 'rare flora' but are in need of further survey.
P4: Priority Four – Taxa in need of monitoring	Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5 – 10 years.



Appendix C

Fauna

Western Australian Wildlife Conservation Act 1950
Conservation Codes
DEC Priority Fauna Codes.



Table 8 Western Australian Wildlife Conservation Act 1950 Conservation Codes

Conservation Code	Description
Schedule 1	"...fauna that is rare or likely to become extinct, are declared to be fauna that is in need of special protection."
Schedule 2	"...fauna that is presumed to be extinct, are declared to be fauna that is in need of special protection."
Schedule 3	"...birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is in need of special protection."
Schedule 4	"...fauna that is in need of special protection, otherwise than for the reasons mentioned [in Schedule 1 – 3]"

Table 9 DEC Priority Fauna Codes.

(Species not listed under the *Wildlife Conservation Act 1950*, but for which there is some concern).

Conservation Code	Description
Priority 1	Taxa with few, poorly known populations on threatened lands.
Priority 2	Taxa with few, poorly known populations on conservation lands. Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown Land, water reserves, etc.
Priority 3	Taxa which are known from few specimens or sight records, some of which are on lands not under immediate threat of habitat destruction or degradation.
Priority 4	Rare taxa. Taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5 – 10 years.
Priority 5	Taxa in need of monitoring. Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.



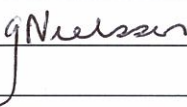
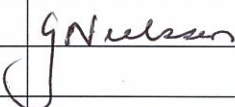
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