MAIN ROADS WA

# PRELIMINARY ENVIRONMENTAL IMPACT ASSESSMENT – GOLDFIELDS HIGHWAY, KILLARA STATION FENCING

**VERSION 2**

**MAY 2007**

**REPORT NO: 2007/091**

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## EXECUTIVE SUMMARY

Main Roads Western Australia plans to construct a fence between SLK 716.43 and 735.83 on the southern side of the Goldfields Highway (H49) adjacent to Killara Station to prevent livestock access to the road and therefore minimise the chance of collision with road users. The fence will extend for approximately 20km and vegetation will need to be cleared from a 3m buffer zone along this length.

This Preliminary Environmental Impact Assessment identifies environmental issues that may arise within the project area as a result of the proposed works.

The scope of this report includes conducting a desktop EIA of the proposed project, including the following:

- Identify and review any existing relevant environmental reports,
- Conduct an initial assessment to determine the key environmental aspects for the proposal;
- Assess the project against the Environmental Protection Acts's 10 Clearing Principles (Schedule 5);
- Assess all environmental aspects likely to require referral of the project and advise whether the project should be referred to the Environmental Protection Agency (EPA);
- Assess all matters of National Environmental Significance likely to require referral of the project and advise whether the project should be referred to the Commonwealth Department of the Environment and Water Resources (DEWR) under the *Environmental Protection and Biodiversity Conservation Act, 1999*;
- Consult with relevant government agencies as required;
- Determine (but do not apply for) clearance 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 Australia Act 1990*
    - *Aboriginal Heritage Act 1972*
    - *Swan River Trust Act 1988*

- Provide a concise report on the findings.

This assessment summarises the impacts that the proposed fence construction is likely to have on environmental values and findings made during a site visit and desktop surveys.

Approximately six hectares of land will be cleared for this project. A summer site survey found no declared rare or priority species of flora. The project complies with the 10 vegetation clearing principles outlined in Schedule 5 of the *Environmental Protection Act, 1986* and no referral is required under the *Environmental Protection and Biodiversity Conservation Act, 1999* for any environmental aspect of this project.

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# 1. INTRODUCTION

Main Roads Goldfields-Esperance Region are proposing to construct a fence line along 19.40 km of the Goldfields highway, between SLK's 716.43 and 735.83. The fencing is adjacent to Killara Station and will be located approximately 100m from the concept centreline. The western end of the fence line is approximately 57km east of Meekatharra in the Shire of Meekatharra. The main purpose of the fence is to negate the potential for collision between livestock and road users, thus minimising physical and financial impacts. To construct the fence, it is expected that 3m by 19.4 km of vegetation (approximately 6ha) will need to be cleared.

As the project involves the disturbance of natural vegetation, a Preliminary Environmental Impact Assessment is required in accordance with Main Roads environmental assessment and approvals process. This report fulfils this requirement and has been prepared in accordance with the Main Roads Guideline; Environmental Assessment and Approval Process and;

- describes the significant aspects of the existing environment;
- details the primary environmental and social impacts of the proposed works;
- identifies any matters likely to warrant referral to the Environmental Protection Authority (EPA), the Department of Environment and Conservation (DEC) or the Commonwealth Department of Environment and Water Resources (DEWR) for formal assessment; and
- provides recommendations for:
- additional investigations that may be required to clarify the expected environmental impacts of the proposed works,
- developing appropriate management measures during the development of the project design and
- obtaining the necessary statutory approvals.

## 1.2 Project Justification

The Office of Road Safety commissioned the Analysis of Road Crash Statistics, 1995 - 2004 (Western Australian Government, 2005a) to determine the cause of accidents in different regions of Western Australia. Table 1 summarises the accidents caused by road users colliding with animal in the Goldfields and Mid-west region of the state:

Table 1: Summary of road incident involving animal in the Goldfields and Mid west regions of Western Australia

| Injury | Goldfields | Mid West |
|---|---|---|
| **Fatal** | 1 | 0 |
| **Hospitalised** | 13 | 18 |
| **Serious** | 14 | 18 |
| **Total** | 14 | 18 |

A total of 32 serious incidents occurred over the study period. The Road Safety Strategy for Western Australia 2003 – 2007 (Western Australian Government, 2005a) highlighted 'removal or protection of roadside hazards' as a significant issue to be addressed in the planning phase to address safety on roads. Construction of fencing around cattle stations is one such abatement technique.

# 2. PROJECT DESCRIPTION

The Goldfields Highway is a state highway maintained by Main Roads Western Australia. It generally runs in a northerly direction connecting the Goldfields with the Pilbara region. The section between Meekatharra and Wiluna (Road H049) runs in an east – west alignment. Due to the land use of the region, heavy vehicles make up a relatively large proportion of road users, with up to 45% of vehicles recorded as heavy vehicles on some areas of the Goldfields Highway. Approximately 73% of vehicles using the section between Meekatharra and Wiluna are Class 1-2 vehicles (Government of Western Australia, 2005a).

The proposed fence line will be constructed to prevent livestock from accessing the Goldfields Highway from Killara Station and thus minimise potential for collision with road users. The fence will be a 4 strand fence, with one electric strand. It is anticipated that a strip of land no greater than three metres wide and 20km long will need to be cleared to facilitate this project.

## 2.1 Location

The fence will be constructed on the south side of the Goldfields Highway (H49) between SLK 735.83 to SLK 716.43 in the Shire of Meekatharra. The western end of the fencing will commence approximately 57km east of Meekatharra and the project area is adjacent to Killara pastoral station.

## 2.2 Water source

No water source will be required for this project. The fence can be constructed on a dry site.

## 2.3 Material source

No material source will be required for this project so excavation outside of the direct fence alignment is not expected to occur.

## 3. ENVIRONMENTAL ASPECTS AND MANAGEMENT

The following section provides a description of the existing environment. Environmental and social issues are identified and discussed relevant to the proposed works. Where appropriate, recommendations to minimise the risk to the environment during and after the project, have also been made.

Main Roads guidelines identify a number of environmental aspects that should be assessed in a preliminary environmental impact investigation however some of these aspects are considered irrelevant to this project. Table 2 identifies these aspects and provides reasons why they were considered irrelevant for this project.

**TABLE 2**
**ENVIRONMENTAL ASPECTS CONSIDERED NOT RELEVANT TO THE PROJECT**

| Environmental Aspect | Justification of Irrelevance |
|---|---|
| Dieback & other diseases or pathogens | The location of the project area is outside of the region in which the dieback fungus will survive. Consequently it is not present within the study area. No other soil borne pathogens are known to occur in the project area. |
| Acid Sulfate Soils | The project area is outside of the region in which potential Acid Sulfate Soils occur. |
| Salinity | Given the nature of the project works involved, it is unlikely that this project will impact on salinity. |
| Air Quality | There are no known sensitive receptors around the project area. Air quality emissions are expected to be negligible. |
| Dust | There are no known sensitive receivers that will be impacted by the proposed works. Dust is likely to minimal and localised. |
| Visual Amenity | Visual impacts are considered to be minimal as the works will not be readily visible from the highway. |
| Public Safety and Risk | This will be managed in accordance with Main Roads specifications and does not require further consideration. |

### 3.1 Climate

The closest meteorological station is located at Meekatharra airport, approximately 57 km from the western edge of the project site. The recorded climatic data is summarised as follows:

| | |
|---|---|
| Mean Annual Maximum Temperature Range | 18.9ºC – 38.2ºC |
| Mean Annual Minimum Temperature Range | 7.4ºC – 24.2 ºC |
| Mean Annual Rainfall | 227.7 mm |

| | |
|---|---|
| Mean Annual Raindays Per Year | 28.5 |
| Mean Annual Evaporation | unknown |

(Bureau of Meteorology Climatic Averages of Australian Sites, 2007)

The region experiences a semi-arid climate with rain occurring in winter or as a result of tropical summer cyclones.

### 3.2.1 Geology and Geomorphology

Information on the soils and geology of the project area was obtained from an online database through the Department of Industry and Resources (DIOR) website. GoeVIEW WA is an online browser-based visual tool for exploring Geological Survey of Western Australia's (GSWA's) geosciences datasets.

The geology of the project area is mainly composed of Proterozoic sandstone and shale over the Yilgarn craton. Nearby mining is predominately gold with copper, but lead and zinc deposits are also found in the area.

Soil in the Murchison region is principally shallow earthy loam overlying red-brown hardpan; shallow stony loams on hills and red earthy sand on sandplains. Soils are highly weathered and neutral to slightly acidic (Beard, 1990). In the project area, soil varies from red sandy loam to red clayey sand.

### 3.2.2 Geomorphology

Mabbutt (1958) describes four physical provinces in the Wiluna to Meekatharra area, being:

a) Murchison Plains
b) Salinaland Plains
c) Central Uplands
d) North-eastern Uplands

The project area lies in the northern part of Salinaland Plains. This province comprises the plateau surface east of the Murchison Catchment. Three types of country occur in this province: the old plateau, trunk valleys and hill belts. The proposed fence would be located in the old plateau country, which is the most extensive country of the province. The area is typified by undulating sand plains with low dunes, low breakaways, small areas of stony plains and alluvial plains.

## 3.2 Land Use

The project is located within the Shire of Meekatharra approximately 57 km east of the Meekatharra Townsite. The landuse in the area is predominately pastoral leases for sheep, goats and some cattle grazing. Killara Station predominately grazes cattle. Mineral exploration and mining also occur in the region, with gold, mineral sands, copper, garnet, zinc, talc and lead being the main minerals mined (Government of Western Australia, 2000).

## 3.3 Contaminated Sites

A search of the Department of Environment and Conservation (DEC) Contaminated Sites Database indicates that there are no contaminated sites within or adjacent to the project area. As the database only holds information on known contaminated sites, it is possible that the site may be listed on the Reported Sites Register as unsubstantiated or remediated. Based on the historical and existing land usage of the area contamination is considered highly unlikely and a detailed investigation is deemed unnecessary.

**Recommendation 1:**

Should any indication of contamination be identified on site, further investigation may be required to confirm or dismiss the presence of contaminated material. Should contamination be suspected within the project area, the DEC should be consulted in accordance with the *Contaminated Sites Act, 2003.*

## 3.4 Water

### 3.4.1 Water Catchments and Drainage

The project lies within the Murchison catchment area, which covers the western part of the Murchison district. More than 80% of the water falling in the district drains to the Murchison, Greenough and Wooramel River systems, which eventually empty into the Indian Ocean. The drainage pattern of the Murchison River basin is considered to be mainly dendritic with no major tributaries (Northern Agricultural Catchment Council).

At least one creek is found in the vicinity of the project area and a number of low-lying areas also occur. Aerial photography suggests that that the creek begins on Killara Station (north of the Goldfields Highway) and continues to lower lying areas where it branches out and drains, probably into other catchments. The creek was dry when a site investigation was carried out in summer 2007, indicating that like most watercourses in the region it is ephemeral.

The low regions around the project area are only likely to be subject to inundation following unusually heavy tropical-influenced seasonal rain, which may only occur every few years. Even following such events, it is unlikely they would remain inundated for long due to the area being mainly highly pervious sands and the groundwater table not being close to the surface.

Should either the creekline or low lying areas be important for drainage into larger catchments (such as Lake Nannine south west of the site) they would play a significant role in maintaining water levels in larger water bodies during seasons of good rain. If this project follows the advice given, the minimal clearing required for this project and the non-intruding fence structure are unlikely to affect the localised drainage to either the creek or low lying areas. Care should be taken to ensure that the natural drainage patterns in the area are not disturbed.

The Department of Water (DoW) confirmed that no permit or licence was required to construct the fence across the creek line in accordance with the *RIWI Act, 1914.* The DoW advised that interference with bed and banks of any watercourses should not result in detrimental impacts to existing dependant ecosystems and the flow of the watercourse.

**Recommendation 2:**

Care should be taken to ensure that natural drainage patterns are not disrupted in any way. Infrastructure or materials shall not be placed where they have the potential to block the flow line of water. Similarly, any substances thought to be contaminants or potentially harmful to water and the natural environment shall not be left in areas where it can be carried by water flows.

If there is any doubt the DEC should be consulted in accordance with the *Contaminated Sites Act, 2003*. For information on drainage requirements and disruption to water catchments, the Department of Water should be contacted, in accordance with the *Rights in Water and Irrigation Act, 1914*. The Department of Water stated that although no permits were required to construct the fence across the creek, Main Roads has to ensure that interference with bed and banks of any watercourses should not result in detrimental impacts on existing depending ecosystems and the flow of the watercourse.

### 3.4.2 Groundwater

Erratic, marginal rainfall coupled with high evaporation means the district relies on groundwater for pastoral, town and mining supplies (Department of Agriculture and Food). The granite-greenstone geology of the Yilgarn craton forms the unconfined fractured rock aquifer of the Murchison region. Groundwater in the region ranges from brackish to hypersaline.

All groundwater within Western Australia is Proclaimed and requires a licence for extraction. Form A from the Department of Water (DoW) covers Licence 5C to take groundwater and Licence 26D to construct a well. This form can be submitted to the Goldfields Regional office of the Department of Water.

The Murchison region is characterised by an extensive drainage pattern on the ground and numerous low lying areas which are all involved with maintaining groundwater. It is important that these areas are not disturbed such that they cannot effectively filter groundwater. The DoW confirmed that the watercourses on Killara station are not within a proclaimed surface water areas as per the *RIWI Act 1914*. Recommendation 2 also applies to the treatment of groundwater within the project area.

**Recommendation 3:**

Obtain Form A (incorporating Licences 5C and 26D) from the Department of Water (available at http://portal.water.wa.gov.au/portal/page/portal/LicensingWaterIndustryServices/Licensing/Forms) and submit to their Goldfields Regional Office.

### 3.4.3 Wetlands

Wetlands include waterbodies such as swamps, billabongs, salt marshes and lakes, whether they be natural, artificial, permanent or temporary. They are important refugia for biodiversity, are efficient filters within river systems and may be significant historically and culturally.

In the Murchison region, all wetlands are ephemeral and there are none in the vicinity of the project area that have been listed on the Wetlands of National Significance registrar (Rangelands NRM Coordinating Group, 2005). Lake Nannine is located approximately 42 km south west of Meekatharra and is listed as a Nationally Important Wetland Site. It is possible that the creekline in the project area may indirectly drain into this wetland. It is therefore

important that drainage through the creek is not impeded. Recommendation 2 also applies to maintaining the nearby wetland.

## 3.5 Vegetation

### 3.5.1 Vegetation Type

The project area occurs in the Murchison Botanical district of the Eremaean Biogeographic region. This region is typified by low Mulga (*Acacia aneura*) Woodlands on lowlands and is often rich in ephemeral species. Structure is often open low tree or small shrub layer to 3m, a sparse layer of low shrubs 1-2m and sparse annual and perennial grasses with ephemerals.

At least half of the vegetation in the project area has been subject to grazing. In these areas, lower storey vegetation is very sparse and is generally restricted to grass species and those species unpalatable to livestock, such as *Solanum lasiophyllum*. Along the creekline, vegetation composition differs slightly, with the presence of some *Eucalyptus* species, including *E. kingsmillii* and other Myrtaceous species.

### 3.5.2 Declared Rare and Priority Flora

A search of DEC databases found a total of 21 conservation significant species were known to occur within the broader Wiluna - Meekatharra area, as presented in Table 3.

**TABLE 3**
**DECLARED RARE AND PRIORITY FLORA POSSIBLY OCCURRING WITHIN THE PROJECT AREA**

| Species | Priority Status | Preferred Habitat | Likelihood to occur within survey sites |
|---|---|---|---|
| *Acacia speckii* | P3 | Rocky soils over granite, basalt or dolerite. Rocky hills or rises | Not likely to occur within site due to soil difference. |
| *Baeckea sp. Sandstone* | P1 | Orange sand. Flats or undulating land. | Possibly occurs within site, but historical records have limited information. |
| *Bulbine pendula* | P3 | Cracking clay pans, margins of tracks, tussock grassland. *A. aneura* shrublands and grasslands | Possibly occurs within survey sites (previously found in vicinity of Wiluna/ Meekatharra) |
| *Calytrix erosipetala* | P3 | Rocky sandstone or granite breakaways | Possibly occurs within survey sites (previously found in vicinity of Wiluna/ Meekatharra) |
| *Calytrix verruculosa* | P1 | Sandy clay | Possibly occurs within survey sites (previously found in vicinity of Wiluna/ Meekatharra) |
| *Drummondita miniata* | P3 | Laterite, breakaways | Possibly occurs within survey sites (previously found in vicinity of Wiluna/ Meekatharra) |
| *Eremophila anomala* | P1 | Basalt outcrop | Unlikely to occur within site. Very few records available. |

| Species | Priority Status | Preferred Habitat | Likelihood to occur within survey sites |
|---|---|---|---|
| *Eremophila congesta* | P1 | Lateritic outcrops in greenstone hills, stony quartzite slopes | Unlikely to occur due to soil difference. |
| *Eremophila fasciata ms* | P3 | On ?slate, stony hills | Unlikely to occur due to soil difference. |
| *Eremophila gracillima ms* | P1 | Stony flats, clayey sand | Probably unlikely to occur within sites as previous records are quite far away (<30km). |
| *Eremophila micrantha ms* | P1 | Red-brown sand or sandy clay, quartz, ironstone, laterite. Sandstone. Flats, slopes, hillsides | Possibly occurs within survey sites (previously found in vicinity of Wiluna/ Meekatharra) |
| *Eremophila retrophila ms* | P1 | Gravelly loam, stony flats. | Possibly occurs within survey sites (previously found in vicinity of Wiluna/ Meekatharra), depending on soil suitability |
| *Eremophila pungens ms* | P4 | Sandy load, clayey sand over laterite. Plains, ridge, breakaways | Possibly occurs within survey sites (previously found in vicinity of Wiluna/ Meekatharra) |
| *Goodenia berringbinensis* | P4 | Red sandy loam. Along watercourses. *Eucalyptus* woodlands and *Acacia* shrublands. | Possibly occurs within survey sites (previously found in vicinity of Wiluna/ Meekatharra) |
| *Grevillea inconspicua* | P4 | Loam, gravel. Along drainage lines on rocky outcrops and creeklines. | Probably unlikely to occur within sites due to habitat difference. |
| *Indogofera gilesii ssp. gilesii* | P3 | Pebbly loam amongst boulders & outcrops. Hills | Unlikely to occur within site due to soil difference. |
| *Maireana prosthecochaeta* | P3 | Laterite, hills, salty places, bottom of breakaways. | Probably unlikely to occur due to habitat difference, but has been found reasonably close to site. |
| *Menkea draboides* | P3 | Red sand or clay, granite | Possibly occurs within survey sites (previously found in vicinity of Wiluna/ Meekatharra) |
| *Ptilotus astrolasius var. luteolus* | P1 | Often on red sandy soils | Possibly occurs within survey sites (previously found in vicinity of Wiluna/ Meekatharra) |
| *Ptilous crosslandii* | P3 | Sandy soils. Colluvial plains | Unlikely to occur with site as previously found quite far away. |
| *Rhodanthe sphaerocephala* | P1 | Clayey loam. On flats | Possibly occurs within survey sites (previously found in vicinity of Wiluna/ Meekatharra) |

A targeted survey was conducted along the proposed fence alignment by two qualified botanists from ATA Environmental in March 2007 (ATA Environmental, 2007). The survey failed to find any priority species within the project site. Four of the priority species listed:

*Bulbine pendula*, *Goodenia berringbinensis*, *Menkea draboides* and *Rhodanthe sphaerocephala* are annual/ephemeral species. These species die down seasonally and re-shoot following adequate rain. As a result, if they do occur within the study sites they would not have been visible during a summer survey. A further survey conducted following seasonal rain would clarify whether these species occur within the project zone.

Table 4 describes the Conservation codes used to classify priority species in Western Australia:

**TABLE 4**
**CONSERVATION CODES AND DESCRIPTIONS**

| Code | Description |
|---|---|
| **X** | taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee |
| **R** | 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, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee. |
| **P1** | 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** | 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** | taxa which are known from several 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 need of further survey |
| **P4** | 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 |

### 3.5.3 Threatened Ecological Communities

The Department of Environment and Conservation (DEC) recognises Threatened Ecological Communities (TEC's) as naturally occurring assemblages of plants and animals which are threatened with extinction by human activity, or at risk of being destroyed or modified significantly by development or other pressures from people. A database search of the of the Commonwealth Department of Environment and Water Resources Environmental Reporting Tool (http://www.environment.gov.au/erin/ert/index.html) found no Threatened Ecological Communities listed within or within close proximity of the project area. Due to the widespread nature of the vegetation in the project area and absence of any other special

landform features, it is not expected that state classification would vary, but a database search of DEC databases would indicate whether any TEC's are thought to potentially occur in or around the project area.

### 3.5.4 Environmentally Sensitive Areas

According to the Government of Western Australia (2003) map of environmentally sensitive and schedule 1 areas in Western Australia, nowhere in or immediately surrounding the project area is considered to be environmentally sensitive. Lake Nannine is located approximately 70 km south west of the project area and Mooloogool conservation reserve is located to the north and east of Killara Station.

### 3.5.5 Conservation Reserves

There are no conservation reserves within or adjacent to the project area. The Mooloogool conservation reserve surrounds the northern and eastern sides of Killara station but does not extend to the project area (Government of Western Australia, 1998).

### 3.5.6 Vegetation Clearing

The *Environmental Protection (Clearing of Native Vegetation) Regulations, 2004* regulates clearing of vegetation under the *Environmental Protection Act (EPA), 1986* to minimise the potential for illegal and unabated clearing. As a result all clearing of native vegetation requires a permit. Two types of permit can be obtained – an Area Permit for removal of vegetation is a specified area (can only be applied for by the owner of the land); and a Purpose Permit for all other situations.

Main Roads Western Australia received a state-wide Purpose Permit (CPS 818/2) allowing it to clear vegetation for specified works until February 2011 as long as adequate planning and management is conducted. The Purpose Permit requires proposed clearing to be assessed against the 10 Clearing Principles detailed in the MRWA permit. The proposed clearing of approximately 6ha complies with the 10 Clearing Principles and therefore does not require referral to the EPA. A completed checklist detailing compliance with the 10 Clearing Principles in Main Roads Purpose Permit CPS 818/2 is detailed in Appendix 1.

Where possible, unnecessary clearing should be avoided. If possible, there should be no removal of large trees and shrubs which may provide important habitat and food source and areas which are already degraded or have previously had vegetation removed should be used for tracks and lay down areas when possible.

**Recommendation 4:**

The clearing of vegetation should be kept to a minimum. Where possible, areas that are already degraded or cleared should be utilised for access tracks and lay-down areas for machinery and equipment. The removal of shrubs or trees which may provide food or habitat should also be avoided when possible.

## 3.6 Weeds

Weeds cause serious economic loss for agriculture and may reduce biodiversity of bushland. The National Weeds Strategy (NWS) was launched in June 1997 and takes a strategic approach to weed management problems of national significance, addressing environmental and agricultural weeds equally (Government of Australia, 2002). The NWS lists three goals

which are to be addressed by the Executive Committee and government at all levels in tackling this form of land degradation. They are:

- To prevent the development of new weed problems
- To reduce the impact of existing weed problems of national significance
- To provide the framework and capacity for ongoing management of weed problems of national significance

The Western Australian Governments FloraBase information systems currently record 1,272 alien taxa within the state. The Western Australian Herbarium is currently determining which of these are naturalised. Weeds that are, or may become, a problem to agriculture or the environment can be formally classified as 'Declared' under the *Agriculture and Related Resources Protection Act* (ARRPA), *1976* on the basis of:

1) The impact of the plant on an individual, agricultural production and the community in general;
2) Whether it is already established in an area; and
3) The feasibility and cost of possible control measures.

Declared plants listed in the *Act* may be assigned a category of control, with the category changing in different parts of the state. The categories pertaining to the Act are as follows:

Category P1: in respect of an areas if the introduction into and movement of those plants should, in the opinion of the Agricultural Protection Board (EPB), be prohibited;

Category P2: in respect of an area if the number or distribution, or both, of those plats should, in the opinion of the APB, be reduced;

Category P3: in respect of an area if the numbers or distribution, or both, of those plants should, in the opinion of the APB, be reduced in the longterm.

Category P4: in respect of an area if those plants should, in the opinion of the APB, be prevented from spreading beyond the places in which they occur;

Category P5: in respect of an area, if in the opinion of the APB, particular action should be taken in relation to those plants on land that is public land or land under the control of a council.

The specific requirements for the different categories of Declared Plants is provided in Table 5:

**TABLE 5**
**CONTROL REQUIREMENTS FOR WEED SPECIES IN WESTERN AUSTRALIA**

| Category | Description |
|---|---|
| P1 | Prohibits movement of the plants or their seeds within the state. This prohibits movement of contaminated machinery and produce including livestock and fodder. |
| P2 | Eradicate infestation to prevent and destroy propagation each year until no plants remain. The infested area must be managed in such a way that prevents the spread of seeds or plant parts, on or in livestock, fodder, grain, vehicles and/or machinery. |
| P3 | Control infestation in such a way that prevents the spread of seed or plant parts within or from the property on or in livestock, fodder, grain, vehicles and/or machinery. Treat to destroy and prevent seed set all plants. |
| P4 | Prevent the spread of infestation from the property on or in livestock, fodder, grain, vehicles and/or machinery. Treat to destroy and prevent seed set all plants. |
| P5 | Infestation on public lands must be treated. |

The Department of Agriculture in Meekatharra listed three species as the most problematic in the region. These species and their characteristics are listed in Table 6:

**TABLE 6**
**MOST SERIOUS WEED THREATS IN PROJECT AREA**

| Scientific name | Common name | Category within project site | Preferred conditions | Propagation method |
|---|---|---|---|---|
| *Opuntia* spp | Prickly Pear | P1, P2 and P4 | Sandy soils. | Seeds and branch segments. |
| *Carthamus lanatus* | Saffron Thistle | P1 and P4 | Crops, pastures, waste grounds. Variety of soils. Disturbed land. | Seed dispersal. |
| *Xanthium spinosum* | Bathurst Burr | P1 and P2 | Disturbed and cultivated land | Burrs dispersed by water or carriers. Seed dormancy broken by high temperatures. |

As the project site falls within the pastoral zone, agricultural weed species are possible. According to the database of weed species in the Meekatharra region (Government of Western Australia, 2007d ), there are a number of weed species of threat in the region. Their details are listed in Table 7.

**TABLE 7**
**WEED SPECIES OF POTENTIAL THREAT OF OCCURRING WITHIN THE PROJECT AREA.**

| Scientific name | Common name | Category | Likelihood of occurrence |
|---|---|---|---|
| *Acacia spp* | Acacias (non native) | P1, P2 | P |
| *Peganum harmala* | African Rue | P1, P2 | U |
| *Berkheya rigida* | African thistle | P1, P2 | U |
| *Alternanthera philoxeroides* | Alligator weed | P1, P2 | U |
| *Sagittaria montevidensis* | Arrowhead | P1, P2 | U |
| *Cynara cardunculus* | Artichoke thistle | P1, P2 | P/U |
| *Zantedeschia aethiopica* | Arum lily | P1, P4 | U |
| *Tamarix aphylla* | Athel pine | P1 | P/U |
| *Jatropha gossypifolia* | Bellyache bush | P2 | U |
| *Rubus laudatus, R. fruticosus agg.-* | Blackberry | P1 | U |
| *Chrysanthemoides monilifera* | Boneseed, Bitou bush | P1, P2 | U |
| *Asparagus asparagoides* | Bridal creeper | P1 | U |
| *Cabomba caroliniana* | Cabomba | P1, P2 | U |
| *Alhagi maurorum* | Camelthorn | P1, P2 | P |
| *Senna alata* | Candlebush | P1, P2 | U |
| *Moraea flaccida, M. miniata* | Cape tulips (1 and 2 leaved) | P1 | U |
| *Nasella neesiana* | Chilean needle grass | P1 | U |
| *Ziziphus mauritiana* | Chinee apple | P1 | P/U |
| *Galium aparine* | Cleavers | P1, P2 | P/U |
| *Rhaponticum repens* | Creeping knapweed | P1, P2 | U |
| *Martynia annua* | Devils claw | P1, P2 | P |
| *Convolvulus arvensis* | Field bindweed | P1 | U |
| *Ulex europaeus* | Gorse | P1, P2 | U |
| *Harrisia martinii* | Harrisia cactus | P1, P2 | U |
| *Lepidium draba* | Hoary cress | P1, P2 | U |
| *Marrubium vulgare* | Horehound | P1, P2 | P |

| Scientific name | Common name | Category | Likelihood of occurrence |
|---|---|---|---|
| *Equisetum arvense; Equisetum spp* | Horsetails | P1, P2 | U |
| *Hymenanche amplexicaulis* | Hymananche | P1, P2 | U |
| *Aegilops cylindrica* | Jointed goatgrass | P1, P2 | U |
| *Bassia scoparia* | Kochia | P1, P2 | U |
| *Lagarosiphon spp.* | Lagarosiphon | P1, P2 | U |
| *Lantana camara* | Lantana | P1 | U |
| *Egeria densa* | Leafy elodea | P1, P2 | U |
| *Prosopis spp.* | Mesquite | P1 | U |
| *Argemone mexicana, A. ochroleuca* | Mexican poppy | P1, P2 | P |
| *Miconia spp* | Miconia | P1, P2 | U |
| *Amaranthus spinosus* | Needle burr, spiny amaranth | P1, P2 | U |
| *Carduus nutans* | Nodding thistle | P1, P2 | U |
| *Xanthium strumarium* | Noogoora burr | P1, P2 | P/U |
| *Parkinsonia aculeata* | Parkinsonia | P1, P2 | P |
| *Myriophyllum aquaticum* | Parrot feather | P1, P2 | U |
| *Parthenium hysterophorus* | Parthenium weed | P1, P2 | U |
| *Echium plantagineum* | Patersons curse | P1 | P/U |
| *Thlaspi arvense* | Pennycress | P1, P2 | U |
| *Cirsium arvense* | Perennial/Canada thistle | P1, P2 | U |
| *Jatropha curcas* | Physic nut | P1, P2 | U |
| *Anona glabra* | Pond apple | P1, P2 | U |
| *Senecio jacobaea* | Ragwort | P1, P2 | U |
| *Cryptostegia grandiflora, C. madagascariensis* | Rubber vine | P1, P2 | U |
| *Sagittaria platyphylla* | Sagittaria | P1, P2 | U |
| *Salvinia molesta* | Salvinia | P1, P2 | U |
| *Gymnocoronis spilanthoides* | Senegal tea | P1, P2 | U |
| *Mimosa pudica* | Sensitive plant | P1, P2 | U |
| *Nasella trichotoma* | Serrated tussock | P1, P2 | U |

| Scientific name | Common name | Category | Likelihood of occurrence |
|---|---|---|---|
| *Hydrocotyle verticillata* | Shield pennywort | P1, P2 | U |
| *Chromolaena odorata* | Siam weed | P1, P2 | U |
| *Senna obtusifolia* | Sicklepod | P1, P2 | U |
| *Chondrilla juncea* | Skeleton weed | P1, P2 | U |
| *Hypericum perforatum* | St Johns wort | P1, P2 | U |
| *Datura spp.* | Thornapple | P1, P4 | U |
| *Galium tricornutum* | Three-horned bedstraw | P1, P2 | U |
| *Hypericum androsaemum* | Tutsan | P1, P2 | U |
| *Silybum marianum* | Variegated thistle | P1, P2 | P/U |
| *Salix spp.* | Willows | P1 | U |
| *Striga spp.* | Witchweed | P1, P2 | P |
| *Amsinckia spp.* | Yellow burr weed | P1, P2 | P |

P = Possibly occurs
U = Unlikely to occur

Many of the plants listed on the list are unlikely to occur in the region or the project area, but are listed as declared weed species of concern under Section 37 of the *Agriculture and Related Resources Protection Act, 1976*. The likelihood of these weeds occurring in the project area has been ranked as possible or unlikely according to preferred soil and climatic conditions and historical data available.

**Recommendation 5:**

A field investigation should be undertaken to confirm the identification and location of weeds species within the project area. Weeds located within the project area should be appropriately managed to prevent their further spread and establishment into the surrounding regions. Contractors and sub-contractors working in the project area should be adequately trained to identify and prevent the spread of weeds. The Department of Agriculture and Food in Meekatharra should be contacted for advice on how to control specific weed species if found on site.

## 3.7 Fauna

A search of The Department of Environment and Water Resources Environmental Reporting Tool (Government of Australia, 2007) database found nine fauna species of conservation significance listed under the *EPBC Act, 1999* which may occur within the project area (Table 8).

**TABLE 8**
**PRIORITY FAUNA WHICH MAY OCCUR WITHIN PROJECT AREA**

| Scientific Name | Common Name | Status under Wildlife Conservation Act Schedule/ Priority | Status under Commonwealth EPBC Act | Likelihood of Occurring |
|---|---|---|---|---|
| *Dasycercus cristicauda* | Mulgara | Schedule 1 | Vulnerable | Possibly occurs |
| *Egernia kintorei* | Giant Desert Skink | Schedule 1 | Vulnerable | Possibly occurs |
| *Leipoa occelata* | Malleefowl | Schedule 1 | Vulnerable | Possibly occurs |
| *Acanthiza iredalei iredalei* | Slender-billed Thornbill (western) | | Vulnerable | Unlikely to occur |
| *Polytelis alexandrae* | Pincess/Alendara's Parrot | Priority 4 | Vulnerable | Possibly occurs |
| *Merops ornatus* | Rainbow Bee-eater | | Migratory | Unlikely to occur |
| *Apus pacificus* | Fork-tailed Swift | | Migratory | Unlikely to occur |
| *Ardea alba* | Great/White egret | | Migratory | Unlikely to occur |
| *Rhinonicteris aurantius (pilbara form)* | Pilbara leaf-nosed Bat | | Vulnerable | Possibly occurs |

The five priority fauna species which potentially occur within the project area are all mobile species and would be able to move to different areas once construction had commenced.

Classification of rare and endangered fauna under the *Wildlife Conservation (Specially Protected Fauna) Notice 2006* recognises four schedules of taxa. These are;

*Schedule 1 –* fauna which are rare or likely to become extinct and are declared to be fauna in need of special protection.

*Schedule 2 –* fauna which are presumed to be extinct and are declared to be fauna in need of special protection.

*Schedule 3 –* birds which 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 which are declared to be fauna in need of special protection; and

*Schedule 4 –* fauna that are in need of special protection, otherwise than for the reasons mentioned in Schedule 1, 2 or 3.

In addition to the above classification, DEC also classifies fauna under five different Priority codes:

*Priority one –* *Taxa with few, poorly known populations on threatened lands.* Taxa which are known from few specimens or sight records from one of a few localities on lands not managed for conservation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened species.

*Priority two –* *Taxa with few, poorly known populations on conservation lands, or taxa with several, poorly known populations not 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. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

*Priority three –* *Taxa with several, poorly known populations, some on conservation lands.* Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.

*Priority four –* *Taxa in need of monitoring.* Taxa which are considered to have been adequately surveyed or for which sufficient knowledge is available and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands. Taxa which are declining significantly but are not yet threatened.

*Priority five –* *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.

The *Wildlife Conservation Act, 1950* outlines the statutory obligations for dealing with priority and threatened flora in Western Australia. This includes not disturbing habitats which are known to be important for the survival of priority taxon.

**Recommendation 6:**

The removal of large trees and shrubs should be avoided as they may provide important habitat and food for local fauna.

Personnel working on the project should be advised to be aware of the potential for nests and dwellings and should any be found, work should stop and the DEC contacted for advice. If priority species are found in the area, it would be necessary to apply for a licence through the DEC to work there and the matter may be referred to the Environmental Protection Agency.

## 3.8 Aboriginal Heritage

A search of the Department of Aboriginal Affairs Aboriginal Heritage Sites Database (Government of Western Australia, 2007a) found no records of known Aboriginal heritage sites along the length of the Goldfields highway covered. As the region is known to be Aboriginal importance, it is likely that not all possible sites of indigenous significance have been listed.

Gidgee Gully and Karalundie are the two nearest Aboriginal Communities. The area is not recognised as an Indigenous Protected Area under the Commonwealth. No Native Title is currently held over the area, although a native title claim application has been made through the National Native Titles Tribunal (Government of Australia, 2006). Details are:

> **Title reference number:** YAGUNGA NYA WAD6132/98, WC99/046
> **Representative:** Ngaanyatjarra Council
> **Location:** Shire of Meekatharra
> **Status:** Registered with NNTT, passed registration test.

An Aboriginal Heritage survey has been organised and results will be presented separate to this assessment.

**Recommendation 7:**

Main Roads should follow the conclusion of the Aboriginal Heritage assessment. Staff contractors and sub-contractors associated with the works should be briefed with respect to Aboriginal heritage issues particularly the potential for sub-surface cultural remains. This will include, but not be limited to, the following:

- Obligations under the *Aboriginal Heritage Act 1972*;
- Identification of Aboriginal heritage sites; and
- Protocols to be observed should archaeological material be encountered during the course of development.

## 3.9 European Heritage

A database search of the Heritage Council of Western Australia (Government of Western Australia, 2007e) found no listing of European heritage sites within the vicinity of the project area. The site investigation along the area also found no relevant relics or artefacts although they were not being directly searched for. As the region has been used by Europeans for mining and agricultural purposes for many years, but is sparsely inhabited, it is possible that unknown relics may occur.

## 4. CONSULTATION

A number of people were contacted for comment in preparation of this assessment:

**Contact:** Anthony Desmond
Department of Environment and Conservation
Midwest Office
**Comments:** Generally no concerns over the project, brought attention to the nearby Mooloogool Conservation Reserve and the research that had been done there on threatened species.

**Contact:** Mark Ouchin
Department of Agriculture and Food
Meekatharra Office
**Comments:** Brought attention to the three weed species of most threat in the area. Raised concern over the planning and effectiveness of any drainage which may be constructed and its effect on the landscape.

**Contact:** Erin Mayer
Department of Water
Midwest Gascoyne Region, Geraldton Office
**Comments:** No permit is required to construct the fence across the creek as it is not proclaimed under the *RIWI Act, 1914*. Stated that Main Roads has to ensure that interference with bed and banks of any watercourses should not result in detrimental impacts on existing depending ecosystems and the flow of the watercourse.

**Contact:** Janelle Atkinson
ATA Environmental
**Comments:** Expressed concerns over priority flora. Main Roads should ensure no threatened flora species occur within the project area.

## 5. ENVIRONMENTAL APPROVALS

In addition to meeting the requirements of the *Environmental Protection Act* 1986, the proposal is required to comply with, amongst others, any or all of a number of Acts of Parliament and Regulations at the State or Commonwealth level as listed below.

- *Environment Protection and Biodiversity Conservation Act, 1999*: The current works proposal requires no approvals under this Act.
- *Soil and Land Conservation Act* 1945: The current works proposal requires no approvals under this Act.
- *Conservation and Land Management Act* 1984: The current works proposal requires no approvals under this Act.
- *Soil and land Conservation Act 1945-1982*: The current works proposal requires no approvals under this Act.
- *Wildlife Conservation Act 1950*: The current works proposal requires no approvals under this Act.
- *Heritage of Western Australia Act, 1990*: The current works proposal requires no approvals under this Act.
- *Aboriginal Heritage Act, 1972:* Results from the Aboriginal Heritage assessment will determine whether approvals need to be sought under this Act.
- *Rights in Water Irrigation Act, 1914:* Under this Act, a licence is required for both removal of groundwater and construction of a well within the site. This can be obtained from the Department of Water.
- *Agriculture and Related Resources Protection Act 1976*: The current works proposal requires no approvals under this Act.

No aspect of the current project proposal requires referral to the Environmental Protection Authority or the Department of the Environment and Water Resources for formal assessment.

## 6. RECOMMENDATIONS

The following recommendations are made in relation to abating and minimising environmental impacts within and surrounding the project area:

1) Should any indication of contamination be identified on site, further investigation may be required to confirm or dismiss the presence of contaminated material. Should contamination be suspected within the project area, the DEC should be consulted in accordance with the *Contaminated Sites Act, 2003.*

2) Care should be taken to ensure that natural drainage patterns are not disrupted in any way. Infrastructure or materials shall not be placed where they have the potential to block the flow line of water. Similarly, any substances thought to be contaminants or potentially harmful to water and the natural environment shall not be left in areas where it can be carried by water flows. If there is any doubt the DEC should be consulted in accordance with the *Contaminated Sites Act, 2003*. For information on drainage requirements and disruption to water catchments, the Department of Water should be contacted, in accordance with the *Rights in Water and Irrigation Act, 1914*. The Department of Water stated that although no permits were required to construct the fence across the creek, Main Roads has to ensure that interference with bed and banks of any watercourses should not result in detrimental impacts on existing depending ecosystems and the flow of the watercourse.

3) Obtain Form A (incorporating Licences 5C and 26D) from the Department of Water (available at: http://portal.water.wa.gov.au/portal/page/portal/LicensingWaterIndustryServices/Licensing/Forms) and submit to their Goldfields Regional Office.

4) The clearing of vegetation should be kept to a minimum. Where possible, areas that are already degraded or cleared should be utilised for access tracks and lay-down areas for machinery and equipment. The removal of shrubs or trees which may provide food or habitat should also be avoided when possible.

5) A field investigation should be undertaken to confirm the identification and location of weeds species within the project area. Weeds located within the project area should be appropriately managed to prevent their further spread and establishment into the surrounding regions. Contractors and sub-contractors working in the project area should be adequately trained to identify and prevent the spread of weeds. The Department of Agriculture and Food in Meekatharra should be contacted for advice on how to control specific weed species if found on site.

6) The removal of large trees and shrubs should be avoided as they may provide important habitat and food for local fauna. Personnel working on the project should be advised to be aware of the potential for nests and dwellings and should any be found, work should stop and the DEC contacted for advice. If priority species are found in the area, it would be necessary to apply for a licence through the DEC to work there and the matter may be referred to the Environmental Protection Agency.

7) Main Roads should follow the conclusion of the Aboriginal Heritage assessment. Staff contractors and sub-contractors associated with the works should be briefed with respect to Aboriginal heritage issues particularly the potential for sub-surface cultural remains. This will include, but not be limited to, the following:

- Obligations under the *Aboriginal Heritage Act 1972*;
- Identification of Aboriginal heritage sites; and
- Protocols to be observed should archaeological material be encountered during the course of development.

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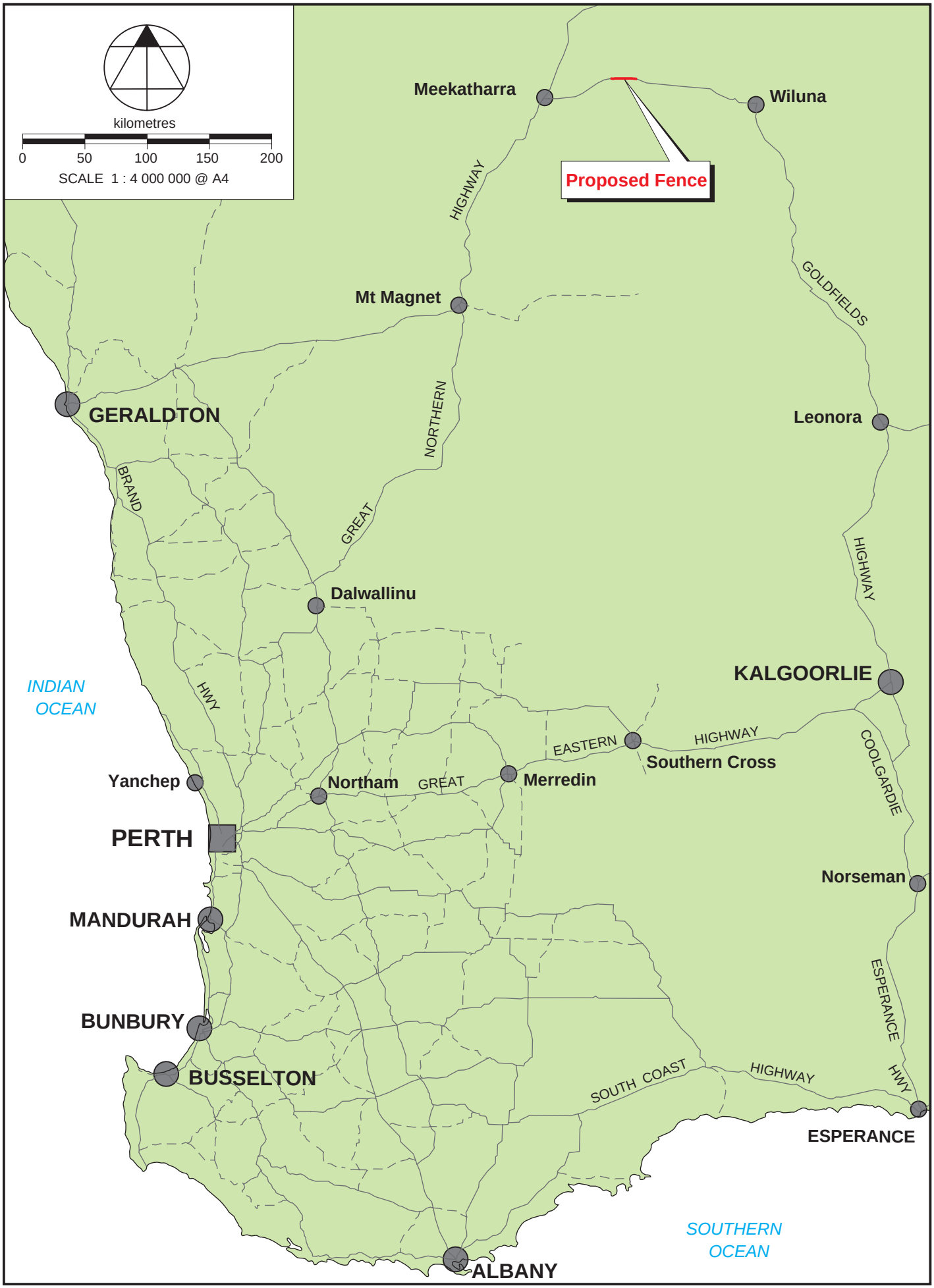
# FIGURES

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ATA Environmental
environmental scientists

PRELIMINARY ENVIRONMENTAL IMPACT ASSESSMENT
GOLDFIELDS HIGHWAY, KILLARA STATION FENCING

**REGIONAL LOCATION**

FIGURE 1

PRINTED: Mon 21 May 07

CHECKED: JA 18-04-07

DRAWN: GLM 18-04-07

DATUM: MGA50

MRW-7-006/PEIA/27_091F2.dgn

GOLDFIELDS HIGHWAY

**SLK 735.83**

Approx. 57km
to Meekatharra

**SLK716.43**

Approx. 100km
to Wiluna

**LEGEND**

Proposed Fence Line

Survey Line

kilometres

0 0.5 1.0 1.5 2.0 2.5

SCALE 1 : 50 000 @ A3

ATA Environmental
environmental scientists

PRELIMINARY ENVIRONMENTAL
IMPACT ASSESSMENT
GOLDFIELDS HIGHWAY
KILLARA STATION FENCING

**PROJECT AREA**

FIGURE 2

SOURCE: Aerial Photo - Main Roads, Rec'd 18-04-07

# APPENDIX

# MRWA Vegetation Clearing Assessment Report

## Project Title

This guideline has been prepared to assist MRWA in addressing condition 7 "Assessment of Clearing Impacts" under Clearing Permit CPS 818/3.

For guidance on how to complete the form, refer to DEC completed reports (active permits) at http://203.20.251.100/cps_reports/.

## 1.0 AREA UNDER ASSESSMENT DETAILS

### 1.1 Proponent details

| | |
|---|---|
| **Proponent's name:** | **MRWA Kalgoorlie Esperance Region** |
| **Contacts** | Name: Joann Johnston<br>Phone: (08) 9323 4323<br>Fax: (08) 92217851<br>Email: joann.johnston@mainroads.wa.gov.au |

### 1.2 Property details

| | |
|---|---|
| **Property:** | Killara Station |
| **Colloquial name:** | |

### 1.3 Area under assessment

| Clearing Area (ha) | No. Trees | Method of Clearing | For the purpose of: | Site Plan Attached |
|---|---|---|---|---|
| 6ha. | Unknown | Mechanical | Construction of fence | Yes |

### 1.4 Avoidance/Minimise clearing

**How have the clearing impacts been minimised?**

A targeted flora survey was conducted in summer 2007 to look for priority species known to occur in the region. A walk was conducted throughout parts of the project areas by two qualified botanists from ATA Environmental and general site conditions noted to gain greater understanding of the area.

The area to be cleared is minimal. Vegetation will only be taken from areas where it is necessary that it is cleared. An approximately 3m strip of vegetation will be removed from an open vegetation type.

## 2.0 BACKGROUND

### 2.1 Existing environment and information

2.1.1 Description of the native vegetation under application

| | | | |
|---|---|---|---|
| **Site Visit Undertaken** | Yes | **Fauna / Flora Survey Undertaken** | Yes. Targetted flora survey |
| **Site Report Attached** | Yes | **Fauna / Flora Survey Report Attached** | Yes. Targetted flora report attached |
| **Site Photos Attached** | No | **Other Relevant References Attached** | No relevant references |

| Vegetation Complex | Clearing Description | Vegetation Condition | Comment |
|---|---|---|---|
| Predominately Open *Acacia* shrubland over mixed understorey | 3m x 19.4km for fenceline. Approximately 6ha. | Excellent to Degraded. | |

## 3.0 ASSESSMENT OF APPLICATION AGAINST 10 CLEARING PRINCIPLES

### (a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

**Comments** Proposal is not at variance to this principle

Vegetation in the project area is typical of the Mulga Shrublands of the surrounding region and as such does not have a high level of biological diversity. The western end of the area to be cleared is in very good condition, but the eastern end has been subject to grazing and as a result is in good to degraded condition. Due to the scattered nature of the vegetation in the region, it is unlikely that removal of vegetation from a 3m strip will result in a significant loss of vegetation in the area, particularly those areas which have been grazed. It is not expected that the project will impact any significant flora or vegetation, does not contain special features or habitats for fauna not found in surrounding bushland, nor any Threatened Ecological Communities. The area in general appears to have relatively low species diversity.

**Methodology** ATA Environmental conducted a botanical survey in summer 2007 which found that most of the project area was uniform in species composition with a large area which had been subject to grazing.

### (b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

**Comments** Proposal is not likely to be at variance to this principle

A detailed fauna search has not been conducted within the project area. As much of the area has been subject to grazing, it is unlikely any indigenous fauna would rely on this area due to a general lack of shelter and reduced food source. The western end of the project area is more likely to support fauna species as it contains a more diverse habitat with a variety of lower, middle and upper storey vegetation species which may provide shelter and food source. Of the threatened species which may possibly use the area, a number are migratory birds which are unlikely to rely on the area. Species more likely to frequent the area include Mulgara, Malleefowl and the Giant Desert Skink. These species are mobile and would be able to move to any of the surrounding are which contains the same Mulga Shrublands. Contractors and sub contractors should be made aware of the potential for nests and habitat occurring, and if found during works, contact the regional DEC office for advice.

**Methodology** Although not specifically targeting fauna, a site visit by ATA Environmental found no evidence of fauna habitat within the project area. As the area is surrounded by native vegetation and all of the known conservation significant fauna in the area are mobile species, it is thought that the removal of a limited amount of vegetation will not result in a negative impact to indigneous fauna.

### (c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

**Comments** Proposal is not likely to be at variance to this principle.

No rare flora are known to exist within the project area. No significant flora were found during a targeted species survey. Of the 21 species of conservation significant

flora known to occur within the region found on DEC databases, four are epemeral/annual species which were not likely to be found in a summer survey. Of those four species, *Rhodanthe sphaerocephala* is the highest priority (P1) and is only known to occur on clayey loam flats which are not present in the project area. Personnel working on the site should be made aware of what the three other potential prioirty species *Bulbine pendula*, *Goodenia berringbinensis* and *Menkea draboides* look like and if suspected on the site the DEC should be contacted for advice before works proceed. A spring survey would otherwise clarify the occurrence of such species.

**Methodology** The area has been surveyed for conservation significant flora by 2 qualified botanists from ATA Environmental during summer 2007.

## (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.

**Comments** Proposal is not at variance to this principle.

No threatened ecological communities occur within the project area. Remnant vegetation in the project area is the same as the widespread *Acacia aneura* shrublands over grasslands that occurs in surrounding areas.

**Methodology** A list of threatened ecological communities (TEC's) in the greater region was obtained from DEC database searches and 2 qualified botanists from ATA Environmental conducted a survey of the area in summer 2007.

## (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.

**Comments** Proposal is not at variance to this principle.

The remnant vegetation remaining in the project area will be subject to only minor clearing which is not likely to have negative impacts on it.
The vegetation type is widespread in the area. According to Beeston et al., (2002), the vegetation type appears to be most closely aligned with 'Shrubland: Mulga Scrub' (vegetation type 39) which still occurs over 100% of its entire pre-European range. 3.6% of the extent of this vegetation type occurs on pastoral land managed by the DEC. In general, Mulga shrublands and widespread and not below the 30% of pre-European recommendation.
A large part of the project area has been subject to grazing and as such does not represent an important area of native vegetation in the area.

**Methodology** A site visit by botanists from ATA Environmental in summer 2007 confirmed that the site did not represent a remnant area of vegetation in the region.

## (f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

**Comments** Proposal is not likely to be at variance to this principle.

A small ephemeral creek bisects the project area. It is only likely to affect an area of approximately 30m including riparian vegetation along the project area. The nearest wetland (Lake Nannine) occurs over 50km away. It is not thought that any part of the project area occurs in an important drainage channel to the wetland. Removal of vegetation within a confined area (3m zone) across the area of the creekline is not

likely to affect drainage to the area. The fence itself is also unlikely to obstruct water flow into the catchment. If possible, removal of large trees around the creek should be avoided as they are regionally significant and may be an important nesting and food site for bird species in particular. In addition, care should be taken to avoid disrupting the natural drainage pattern of the area (e.g. back filling into the creek).

**Methodology** It is the opinion of ATA Environmental following a site visit that removal of a limited number of trees from a small transect across the ephemeral creek will not have detrimental effect on drinage or ecosystem health in the area.

## (g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

**Comments** Proposal is not at variance to this principle.

It is not thought that appreciable land degradation will result from clearing of native vegetation in the project area. Much of the project area has been subject to pastoral grazing so is already degraded. Areas that have not been subject to as much grazing pressure will have minimal disturbance which is not likely to cause any significant degree of land degradation. The open nature of the shrublands and minimal understorey species means that a comparatively small amount of vegetation will need to be cleared from grazed areas. It is thought, instead, that the construction of the fence may restrict livestock access to surrounding remnant bushland thus protecting it. The amount of vegetation needing to be removed from areas in better condition is also expected to be minimal due to the open nature of the shrublands in the area.

Where possible, machinery lay down areas should be put in places which have already been degraded and other associated infrastructure such as tracks should be placed to avoid removing as many large shrubs and trees as possible, with priority going to locating these areas in sites that have already been subject to clearing or degradation.

**Methodology** A site visit by ATA Environmental in summer 2007 found that land degradation as a result of agriculture had occurred in much of the project area and as a result it is not considered that further degradation will result from this project.

## (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.

**Comments** Proposal is not at variance to this principle.

Mooloogool conservation reserve surrounds the north and east of Killara Station. The vegetation of this reserve is predominately Acacia Shrublands as in the project area. Lake Nannine is recognised as a nationally important wetland and is found approximately 60km to the south west of the project area. The project area is not thought to have any positive or negative ramifications on either of these sites and the assocaited environmental values of these areas are not likely to be impacted upon by the development of the fenceline.

**Methodology** As long as the management measures and recommendations made in this report are followed and due consideration is given to activities, ATA Environmental can see no reason why the environmental values of nearby conservation areas would be detrimentally impacted on by the proposed project.

## (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.

**Comments** Proposal is not at variance to this principle.

As a minimal amount of vegetation will be cleared it is not likely to affect the quality of surface or underground water or impact on drainage in the area. The area is not thought to be part of any major drainage channels and water quality is not likely to be affected by the project.

**Methodology** Correspondance with the DoW in the MidWest - Gascoyne Region indicated that as long as work was undertaken appropriately and in accordance with this report the proposed works would not cause deteroration in the quality of surface or ground water.

## (j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

**Comments** Proposal is not at variance to this principle

As the fenceline is not a solid structure but a 4 strand wire fence, it is not likely to impede the flow of water and result in exacerbation, increased incidence or intensity of flooding. In addition, the water table is not so close to the ground surface as to rely on the occurrence of trees to minimse flooding occurrence. As the area occurs over highly pervious sand, most water will be rapidly absorbed into the soil. The limited amount of vegetation to be removed is not likely to affect the possibility of flooding in the area.

**Methodology** Given the impervious nature of the soil in the area and limited amount of vegetation to be cleared, ATA Environmental can see no reason to suggest that the incidence or potentail for flodding islikely to increase as a result of the proposed works.

## Planning instrument, Native Title, RIWI Act Licence, EP Act Licence, Works Approval, Previous EPA decision or other matter.

**Comments** The site occurs on Crown Land under Pastoral Lease.

No Native Title is currently recognised for the area, but an application has been made for the surrounds.

The Rights in Water and Irrigation Act (RIWI) 2000 is not relevant to this project as there no waterways or wetlands in the project area and groundwater occurs in unproclaimed yilgarn fractured rock which does not require licensing.

MRWA has a state-wide purpose permit for land clearing which is valid until 2011 so does not need to apply for a separate EPA Clearing Permit for this works project. The project adheres to the 10 Clearing Principles.

Should rare fauna occur within the project area, a licence would need to be granted by the EPA under the Wildlife Conservation Act 1950. This is not necessary with curent knowledge.

No other permits or licences are likely to be necessary for the works to be carried out.

## 4.0 ASSESSOR'S RECOMMENDATION

**RECOMMENDATION:** It is the opinion of the assessor that there will be minimal environmental impact resutling from the clearing of vegeation to construct the fencing. The subject area is a narrow belt of land and the open nature of the shrubland of the area means that little vegetation should have to be removed. Much of the area to be cleared has already been subject to grazing and therefore understorey is limited. The area to be cleared is minimal and is not likely to have any negative environmental consequences within the immediate vicinity or further afield.

Three recommendations are suggested:

1). Removal of vegetation be limited to where it is necessary. Degraded and cleared areas should be prioritised as places for acces tracks and lay down areas. The removal of vegetation thought to provide important habitat or food source for local fauna should be avoided.

2). A spring survey be conducted to look for prioirty flora species in the project area. A summer survey has been undertaken which found no listed flora, but a number of ephemeral species possibly occur in the area.

3). Care be taken to ensure the natural drainage of all areas is not affected as much as is reasonably possible and that where possible unnecessary reomaval of vegetation is avoided.

**Janelle Atkinson**

**Environmental Scientist - Botanist**

**ATA Environmental**

## 56.0 REFERENCES

Beeston, G.R, Hopkins, A.J.M and Shepherd, D.P. (2002). *Land-use and Vegetation in Western Australia.* Department of Agriculture, Western Australia, Resource Management Technical Report 250.