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Main Roads Western Australia

Report for Preliminary Works Associated
with Realignment of Great Northern Highway
around Wedgefield Industrial Estate

Preliminary Environmental
Impact Assessment

March 2011

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- B MRWA Vegetation Clearing Impact Assessment Report

Abbreviations

ASS	Acid Sulphate Soil
BoM	Bureau of Meteorology
CEMP	Construction Environmental Management Plan
DEC	Department of Environment and Conservation
DEWHA	Department of Environment, Water, Heritage and the Arts
DoW	Department of Water
DRF	Declared Rare Flora
EIA	Environmental Impact Assessment
EMS	Environmental Management System
EPA	Environmental Protection Authority
ESA	Environmentally Sensitive Area
GHD	GHD Pty Ltd
GNH	Great Northern Highway
MRWA	Main Roads Western Australia
PEC	Priority Ecological Community
PEIA	Preliminary Impact Assessment
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities
TEC	Threatened Ecological Community
TDS	Total Dissolved Solids
UCL	Unallocated Crown Land

Executive Summary

Main Roads Western Australia (MRWA) is proposing to construct and operate a new 8 km section of Great Northern Highway, including all associated infrastructure and intersections, 5 km south of Port Hedland. The new road will pass to the north of the Wedgefield industrial estate to improve service to the Port Hedland port and reduce traffic conflicts between heavy vehicles and light vehicles on the existing Great Northern Highway and Port Hedland intersection.

Prior to road construction, preliminary works including the relocation of powerlines to underground are required. Undergrounding of powerlines will be required in four locations along the proposed Great Northern Highway alignment, including three locations to the south and south-west of Wedgefield and one location to the north of Wedgefield. Main Roads is required to obtain environmental approvals for Horizon Power to complete relocation of its services in advance of the commencement of the reconfiguration of the Great Northern Highway.

Preliminary works required to be undertaken will also include geotechnical investigations to assess the soil and groundwater conditions prior to commencement of road construction.

GHD completed a Preliminary Environmental Impact Assessment (PEIA) for these preconstruction works to assist in identifying the need for additional field investigations and regulatory approval requirements.

Potential Impacts

The PEIA identified vegetation and fauna as the key factors relevant to proposed preliminary works.

Vegetation

The proposed works are located within an area which has been subject to previous disturbances and as such, much of the area has been cleared. No clearing of native vegetation will be required for geotechnical investigations, however, the proposed relocation of power lines will require clearing of approximately 1.5 ha of vegetation associated with vegetation type **AsTs**: Low open heath of *Acacia stellaticeps*, *Hybanthus aurantiacus* and *Corchorus incanus* over hummock grassland of *Triodia schinzii*, *Triodia epactia* and *Eriachne obtuse*.

Areas mapped as supporting mangrove vegetation (**AmTspp.XI**: Open shrubland of *Avicennia marina* and *Tecticornia* spp. over scattered sedges of *Cyperus* sp) occur in the vicinity of relocation works in the intertidal areas, however no clearing of mangrove vegetation will be required (Main Roads, pers. comm, 3 March 2011).

As the majority of works are anticipated to occur in already cleared areas, the impacts resulting from clearing will be minimal. An assessment of the proposed works has determined that the proposed clearing is unlikely to be at variance with the 10 Clearing Principals.

Fauna

Vegetation type AsTs was found to support Mulgara (*Dasyurus cristicauda*), which is listed as Vulnerable under the *EPBC Act* and Schedule 1 under the *Wildlife Conservation Act 1950*.

Impacts to vegetation type AsTs will be limited to small linear disturbances totalling a maximum of approximately 1.5 ha, where clearing may be required for installation of underground or overhead power

lines. Due to the minimal amount of clearing required to complete the works, impacts to Mulgara are expected to be minimal.

Other factors

A number of other actual and potential impacts have been identified. These relate primarily to the construction phase, and can generally be managed using standard strategies and techniques. These issues are:

- ▶ Acid Sulphate Soils;
- ▶ Surface hydrology;
- ▶ Water quality;
- ▶ Visual amenity;
- ▶ Noise; and
- ▶ Air quality (ie dust).

Recommendations

- ▶ Clearing of native vegetation should be minimised as far as possible;
- ▶ A Construction Environmental Management Plan should be developed to manage the potential environmental impacts of construction activities associated with geotechnical activities and the relocation of powerlines to underground;
- ▶ A Fauna (Mulgara) Management Plan should be developed for the project to ensure potential impacts to Mulgara and their habitat (particularly vegetation type AsTs) are minimised; and
- ▶ An ASS investigation should be undertaken and a comprehensive ASS management plan developed and implemented.

Statutory Approvals

There are no environmental impacts or issues associated with the proposed preliminary works which are considered as having a significant impact on matters of national environmental significance which would trigger the Commonwealth's *EPBC Act 1999*. Further, it is not anticipated that this project will require referral to the EPA.

It is considered that clearing for the preliminary works is unlikely to be at variance with the 10 Clearing Principles. Therefore, clearing for preliminary works is considered possible in accordance with Main Roads State-wide purpose "Clearing Permit" (CPS 818-5).

Should dewatering be required during construction (ie for installation of underground power services), MRWA will be required to obtain a Licence to Take Groundwater under Part 5C of the *Rights in Water and Irrigation Act 1914*.

1. Introduction

Main Roads Western Australia (MRWA) is proposing to construct and operate a new 8 km section of Great Northern Highway, including all associated infrastructure and intersections, 5 km south of Port Hedland. The new road will pass to the north of the Wedgefield industrial estate to improve service to the Port Hedland port and reduce traffic conflicts between heavy vehicles and light vehicles on the existing Great Northern Highway and Port Hedland intersection.

The realignment has previously been assessed in the Environmental Impact Assessment for the reconfiguration of Great Northern highway in Port Hedland (GHD, 2010). This report considers pre-construction activities including the undergrounding of power lines and geotechnical investigations required prior to road construction.

1.1 Scope of Report

This Preliminary Environmental Impact Assessment (PEIA) has been prepared to conform to the Main Roads Consultant Brief. This PEIA:

- Identifies and reviews any existing relevant environmental reports;
- Conducts and initial assessment to determine the key environmental aspects for the road proposal;
- Assesses the project against the 10 Clearing Principles;
- Assesses all environmental aspects likely to require referral of the project and advise 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 and advise whether the project should be referred to the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) – formerly Department of the Environment, Water, Heritage and the Arts (DEWHA);
- Consult with relevant government agencies as required; and
- 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*; and
 - *Aboriginal Heritage Act 1972*.

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

- Climate;
- Geology;
- Hydrology;

- Vegetation and flora;
- Fauna;
- Indigenous and non-indigenous heritage;
- Land use;
- Visual amenity; and
- Construction phase activities and impacts.

1.2 Structure of Report

This PEIA has been structured as follows:

- Section 2 – Project overview.
- Section 3 – Legal framework.
- Section 4 - 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 MRWA.
- Section 5 – Draws conclusions from the PEIA and reiterates the management recommendations provided by Section 3.
- Section 6 – Discusses the need for referral to the EPA, the Commonwealth and approvals that may be required by the proposed project.
- Section 7 – Discusses recommendations for environmental management during the construction phase of the preliminary works.

2. Project Description and Justification

2.1 Project Background

Main Roads Western Australia (MRWA) has identified the need to reconfigure the Great Northern Highway (GNH) at Port Hedland to support projected growth in the region. To support this anticipated growth, MRWA has identified a broad strategy for the short and long-term road networks that meet increasing road transport demands. As part of this process, MRWA has undertaken a number of environmental investigations to identify reconfiguration options, with a particular emphasis on road freight access to the port of Port Hedland. The studies have also examined access between the communities of Port Hedland and South Hedland (MRWA, 2007 and 2008).

The preferred option for the future long-term alignment of the Great Northern Highway at Port Hedland is to realign the road to the north and west of the Wedgefield industrial area (Figure 1).

Main Roads Western Australia (MRWA) is proposing to construct and operate a new 8 km section of Great Northern Highway, including all associated infrastructure and intersections, 5 km south of Port Hedland. The new road will pass to the north of the Wedgefield industrial estate to improve service to the Port Hedland port and reduce traffic conflicts between heavy vehicles and light vehicles on the existing Great Northern Highway and Port Hedland Road.

2.2 Project Description

Prior to construction of the proposed Great Northern Highway reconfiguration to the north of Wedgefield, preliminary works including geotechnical investigations and the relocation of powerlines to underground will be required. These auxiliary works were not considered as part of the Environmental Impact Assessment completed for the proposed reconfiguration of the Great Northern Highway.

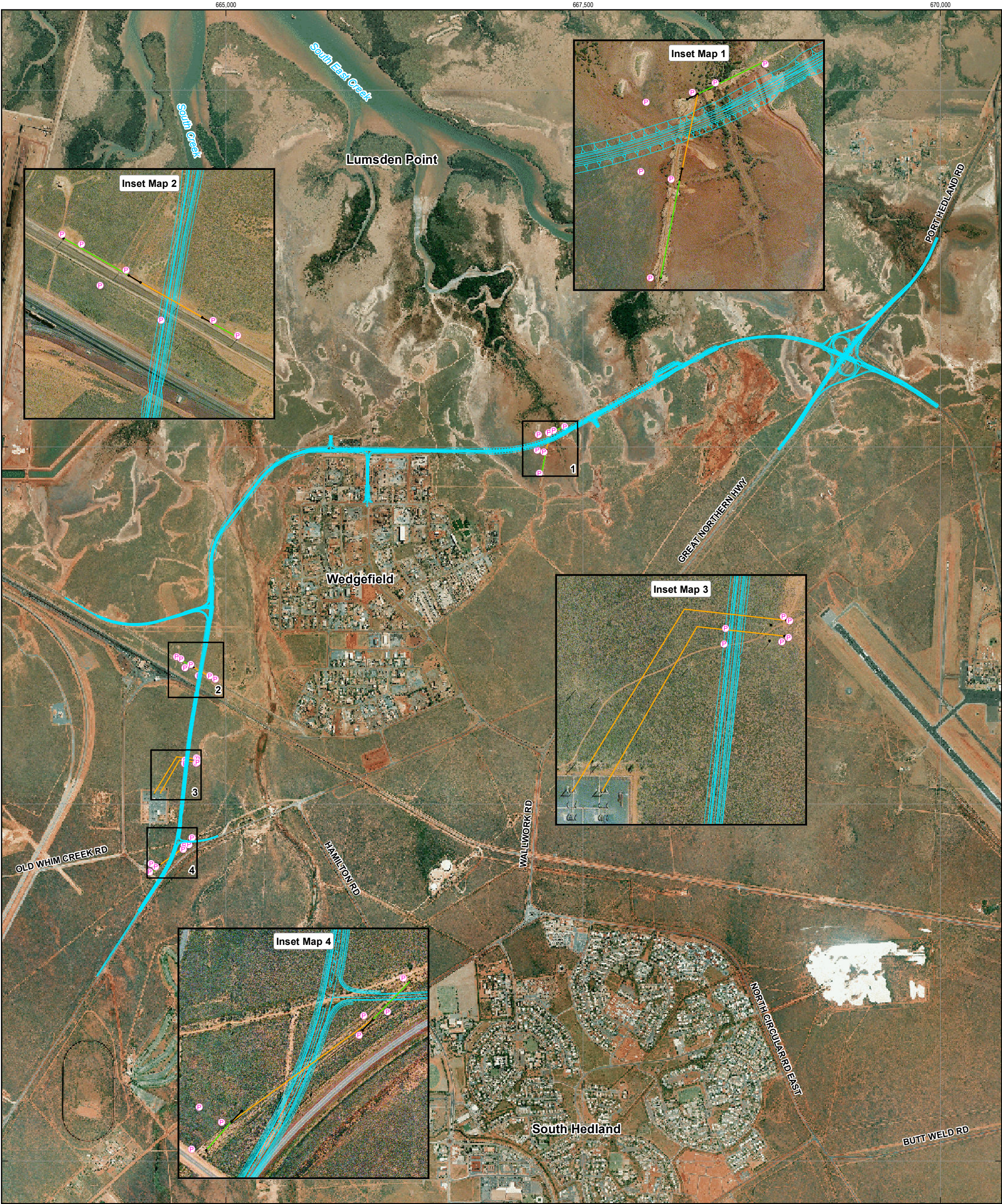
Main Roads is required to obtain environmental approvals for Horizon Power to complete relocation of its services in advance of the commencement of the reconfiguration of the Great Northern Highway.

Geotechnical investigations will also be required prior to commencement of road construction to assess the soil and groundwater conditions of the road alignment.

This report provides the Preliminary Environmental Impact Assessment (PEIA) for these preconstruction works. The outcomes of this report will assist in identifying the need for, and scope of, field investigations. The outcomes of the report will also assist in identifying if the project requires statutory approval.

2.3 Study Area

The project is located near the Wedgefield industrial estate area (Figure 1). The new section of road will be realigned around Wedgefield industrial estate to the north and west. Undergrounding of powerlines will be required in four locations along the proposed alignment, as shown in Figure 1. Three of these locations are to the south and south-west of Wedgefield, while additional works will also be required to the north of Wedgefield.



LEGEND

Powerline Point Proposed Great Northern Hwy B2/A Design

Powerline Relocation - Type

Overhead Powerline

Underground Powerline

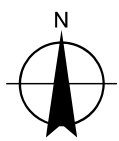
Other Powerline



0 125 250 500 750 1,000 1,250

Meters

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 50



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Locality Map

Figure 1

3. Legal Framework

3.1 Legislative Framework

Table 1 outlines the key Commonwealth and State (WA) environmental legislation that may be relevant to the proposal.

Table 1 Key Environmental Legislation Relevant to the Project.

Legislation	Responsible Government Agency	Aspect
Commonwealth Legislation		
Environment Protection and Biodiversity Conservation Act 1999	Department of Sustainability, Environment, Water, Population and Communities (formerly Department of Environment, Water, Heritage and Arts)	Rare flora and fauna
Native Title Act 1993	National Native Title Tribunal	Native title
State Legislation		
Aboriginal Heritage Act 1972	Department of Indigenous Affairs	Archaeological and ethnographic sites
Agricultural and Related Resources Protection Act 1976	Department of Agriculture, Western Australia	Weeds and feral animals
Conservation and Land Management Act 1984	Department of Environment and Conservation	Management of contaminated sites
Contaminated Sites Act 2003	Department of Environment and Conservation	Management of contaminated sites
Country Areas Water Supply Act 1946	Department of Water	Potable water supply
Environmental Protection Act 1986 (Part IV)	Department of Environment and Conservation	Environmental impact assessment and management
Environmental Protection Act 1986 (Part V)	Department of Environment and Conservation	Works Approvals and Licenses for Prescribed Premises
Environmental Protection (Noise) Regulations 1997	Department of Environment and Conservation	Noise standards
Environmental Protection (Clearing of Native Vegetation) Regulations 2004	Department of Environment and Conservation	Clearing of native vegetation
Heritage of Western Australia Act 1990	Heritage Council of Western Australia	European heritage protection
Land Administration Act 1997	Department of Regional Development and Lands	Administration of State Land
Rights in Water and Irrigation Act 1914	Department of Water	Access to and use of water resources; protection and management of river flows and

Legislation	Responsible Government Agency	Aspect
		drainage
Soil and Land Conservation Act 1945	Department of Agriculture	Protection of soil and prevention/management of soil erosion
Wildlife Conservation Act 1950	Department of Environment and Conservation	Protection of native wildlife

3.2 Policies and Guidelines

The EPA assesses projects in accordance with the *Environmental Protection Act 1986* (EP Act) and has developed a range of policies and procedures to assist proponents in preparing information in relation to projects for use by the EPA in its assessment.

The key EPA Position Statements and Guidance Statements relevant to this proposal are:

- Position Statement 2: Environmental Protection of Native Vegetation in Western Australia (December 2000);
- Position Statement 4: Environmental Protection of Wetlands (November 2004);
- Position Statement 7: Principles of Environmental Protection (August 2004);
- EPA Guidance Statement No. 1: Protection of Tropical Arid Zone Mangroves along the Pilbara Coastline (April 2001);
- EPA Guidance Statement No. 8: Environmental Noise (Draft) (May 2007);
- EPA Guidance Statement No. 33: Environmental Guidance for Planning and Development (May 2008); and
- EPA Guidance Statement No. 41: Assessment of Aboriginal Heritage (April 2004).

3.3 Other Related Approvals

The proposed reconfiguration of the Great Northern Highway south of Port Hedland is understood to have been referral to EPA under Section 38 of the *Environmental Protection Act 1986*. The EPA determined that the proposal did not require formal assessment (not assessed – public advice given).

MRWA also referred the proposed reconfiguration of the Great Northern Highway at Port Hedland to SEWPaC; formerly known as the Department of Environment, Water, Heritage and the Arts (DEWHA)) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) on 23 December 2010. The referral related to potential impacts on threatened species. On 25 January 2011, SEWPaC determined that the proposal is not a Controlled Action provided it is undertaken in accordance with the manner described in the decision document.

The *Aboriginal Heritage Act 1972* protects places and objects customarily used by, or traditional to, the original inhabitants of Australia. Where an activity on land may disturb an Aboriginal site or object, permission to use the land is required under Section 18 of the *Aboriginal Heritage Act*. A Section 18 application has been submitted under the *Aboriginal Heritage Act 1972* by MRWA in October 2009 relating to impacts associated with reconfiguration of the Great Northern Highway, with conditional approval granted by the Minister for Indigenous Affairs in February 2010 (Appendix A).

As the reconfiguration is located on Unallocated Crown Land (UCL), the provisions of the *Commonwealth Native Title Act 1993* apply. MRWA understands they may be required to consult with the relevant Native Title claimants.

Further, MRWA will need to apply to the Department of Water (DoW) obtain licences relating to the abstraction of groundwater if dewatering is required during construction.

4. Existing Environment

The environmental and social issues considered relevant to this Project have been previously described for the Reconfiguration of the Great Northern Highway at Port Hedland (GHD, 2010) and are outlined on a topic-by-topic basis in the following sections. 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 MRWA.

4.1 Climate

The Pilbara region of Western Australia has an arid-tropical climate with two distinct seasons: a hot summer (October – April) and a mild winter (May – September). The average yearly evaporation exceeds rainfall by as much as 2,500 mm per year. Seasonally heavy but unreliable rainfall, together with high temperatures and high diurnal temperature variations are also characteristic climate features of the region.

The majority of the Pilbara has a bimodal rainfall distribution. From January to March rain results from storms moving in from the north, producing sporadic and intense thunderstorms. Tropical cyclones and depressions moving southwards from northern Australian waters also produce heavy rainfall events in this period which sustain the Pilbara vegetation. From May to June, cold fronts move eastwards across Western Australia and may occasionally reach the Pilbara region. These cold fronts produce lighter winter rains that are generally not adequate for extensive plant growth.

The closest Bureau of Meteorology (BoM) weather station to the project area is located at Port Hedland Airport. Recorded historical climate data for Port Hedland Airport is summarised below:

- ▶ Mean Daily Maximum Temperature: 27.1 °C (July) – 36.8 °C (March)
- ▶ Mean Daily Minimum Temperature: 12.3 °C (July) – 25.5 °C (January/February)
- ▶ Mean Annual Rainfall: 309.9 mm
- ▶ Mean Annual Rain Days: 20.4 days

(Source: BoM, 2010)

4.2 Geology and Soils

The Pilbara region comprises a portion of the ancient continental Western Shield that dominates the geology of Western Australia. The Pilbara contains some of the earth's oldest rock formations which are thought to be around 3.5 billion years old. The western Shield is comprised of pre-Cambrian Proterozoic and Archaean rocks. The study area is located on the Abydos Plain with the geology of the area described as Quaternary alluvium near the coast. Further inland, Archaean granite dominates with other Archaean rocks outcropping in small hills, ranges and dykes.

The Corridor falls within two Land Systems, the Uaroo and Littoral Land Systems, as mapped by Van Vreeswyk *et al.* (2004). The Uaroo Land System is made up of Quaternary colluvium and alluvium soils dominated by broad sandy plains and pebbly surfaced plains and tracts receiving sheet flow (Van Vreeswyk *et al.*, 2004). The Littoral Land System consists of Quaternary mudflat deposits, clay, salt and

sand and eolian sand (Van Vreeswyk *et al.*, 2004). This Land System is dominated by tidal and samphire flats and alluvial plains (Van Vreeswyk *et al.*, 2004).

4.2.1 Acid Sulphate Soils

Acid sulphate soil (ASS) risk mapping has been prepared for several regions of Western Australia, including the Pilbara coastline. ASS risk maps are generally based on existing geomorphological, geological and hydrological information (DEC, 2009). ASS risk mapping available through the WA Atlas (Landgate, 2009) indicates that approximately 1.2 km of the Corridor is within an area classified as having high to moderate risk of ASS within 3 m of the natural soil surface (Figure 2). The remainder of the Corridor is mapped as having no known ASS risk.

4.3 Contaminated Sites

A review of the DEC Contaminated Sites Database indicates that there are no contaminated sites within or adjacent to the proposed Corridor.

4.4 Hydrology

4.4.1 Groundwater

The proposed Corridor is within the Ashburton sub-area of the Pilbara Groundwater Area, proclaimed under the *Rights in Water and Irrigation Act 1914 (RIWI Act)*.

Groundwater in the study area occurs in unconsolidated sediment (surficial) aquifers (Van Vreeswyk *et al.*, 2004). Groundwater recharge to the coastal plain generally occurs through leakage from surface water flows and, to a lesser extent, through direct infiltration of rainfall.

The Port Hedland region is understood to have poor groundwater potential, based on bore yields and salinity. Groundwater in the area is of marginal quality, ranging from 1,500 – 3,000 mg/L total dissolved solids (TDS) and trending higher with distance from the coast (Van Vreeswyk *et al.*, 2004).

4.4.2 Surface Water and Drainage

Low-lying areas surrounding Port Hedland are subject to flooding, typically associated with cyclonic rainfall and storm surge. The coastal flats of Port Hedland include bare saline tidal flats, fringing mangroves and shallow tidal creeks (Van Vreeswyk *et al.*, 2004). Wedgefield is located on a drainage plain that drains toward South Creek and South West Creek (WAPC, 2003).

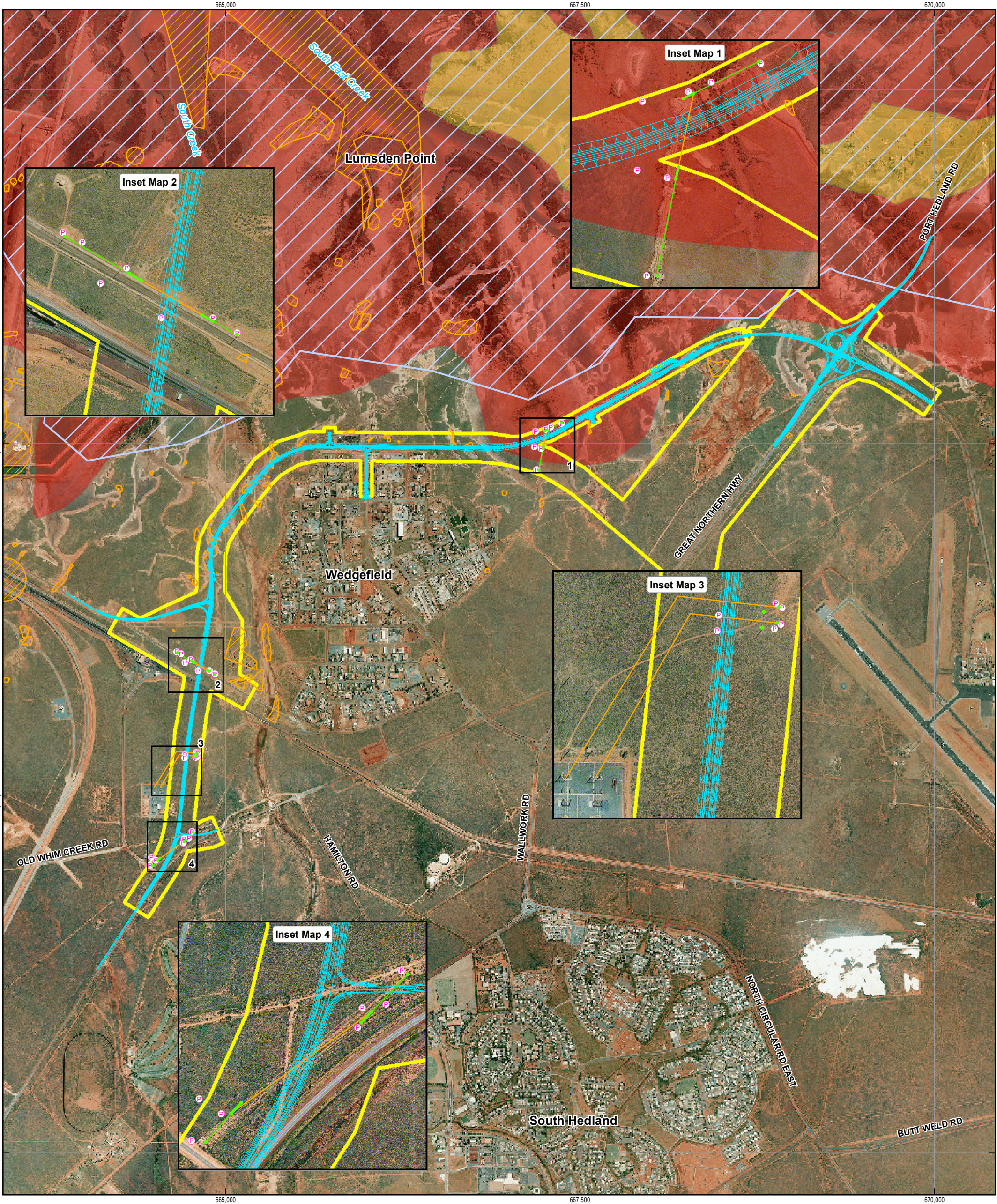
A study into the combined effects of storm surge and rainwater flooding from the Turner River to 12 Mile Creek was carried out by the Minister for Planning, the Town of Port Hedland and the Department of Resources Development in 1998. The study mapped areas likely to be subject to inundation during 50 and 100 year average recurrence interval (ARI) rainfall events (WAPC, 2003). These areas are identified in the Port Hedland Town Planning Scheme No. 5.

Waterways and wetland areas within the Pilbara region are ephemeral and typically only flow or fill during seasonal rainfall events.

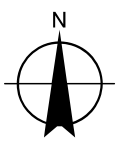
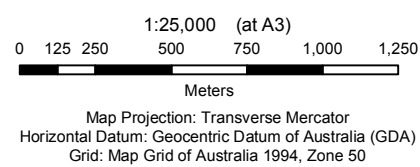
There are a number of ephemeral creeklines along the proposed Corridor that are likely to become inundated during high tides and storm surge events. South Creek lies approximately 400 m to the east of the Corridor and flows in a north-south direction.

The northern section of the Corridor passes through areas of semi-saline low-lands and tidal mud flats that may be inundated during storm surge events and may be subject to inundation associated with salt flats and tidal areas, which support mangrove vegetation. Mangrove areas are discussed in further detail in Section 4.5.7.

The Corridor is located within the Pilbara surface water area proclaimed under the *RIWI Act*.



- LEGEND**
- | | | |
|------------------------------------|--|-----------------------------|
| Powerline Point | Proposed Great Northern Hwy B2/A Design | Aboriginal Heritage Sites |
| Powerline Relocation - Type | Acid Sulfate Soils - Pilbara | Register of National Estate |
| Overhead Powerline | High to moderate ASS disturbance risk (<3m from surface) | Ethnographic Corridor |
| Underground Powerline | Moderate to low ASS disturbance risk (<3m from surface) | |
| Other Powerline | | |



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Environmental Constraints

Figure 2

4.5 Vegetation and Flora

A flora and vegetation survey of the alignment options was undertaken by GHD in June 2009. The vegetation and flora field surveys were undertaken with regards to the EPA Guidance Statement No. 51, *Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment in Western Australia*, where possible. The report is summarised in the following sections.

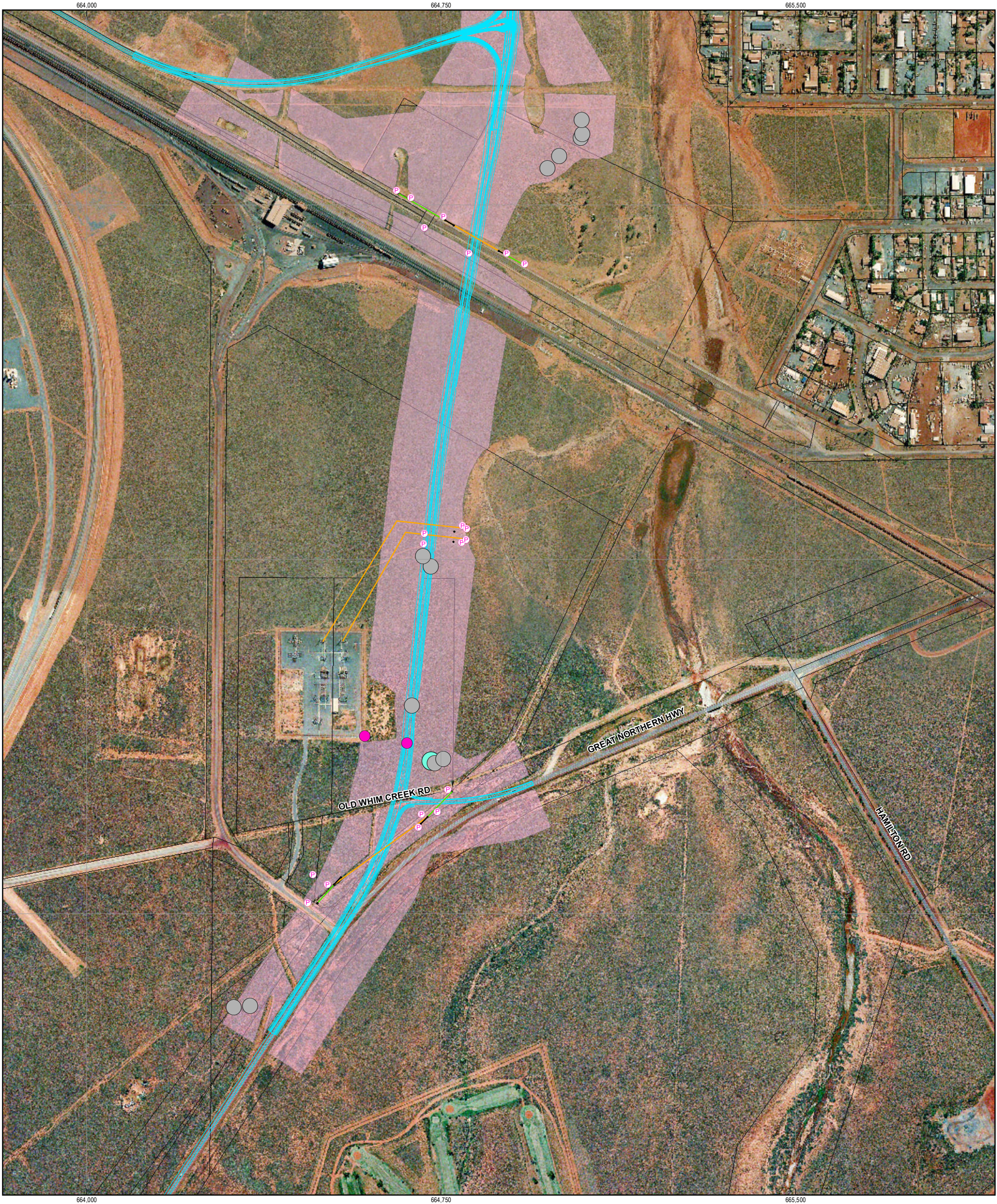
4.5.1 Vegetation Type

The vegetation within the study area was classified into two vegetation types based on Aplin's (1979) modification of the vegetation classification system of Specht (1970).

The vegetation types have been mapped in Figure 3, and are summarised below:

- ▶ **AsTs:** Low open heath of *Acacia stellaticeps*, *Hybanthus aurantiacus* and *Corchorus incanus* over hummock grassland of *Triodia schinzii*, *Triodia epactia* and *Eriachne obtuse*;
- ▶ **AmTspp.XI:** Open shrubland of *Avicennia marina* and *Tecticornia* spp. over scattered sedges of *Cyperus* sp; and

The remainder of the study area is mapped heavily disturbed / predominantly cleared areas with some disturbance opportunists such as **Cenchrus ciliaris* present.



LEGEND

Mulgara Locations

- Prints
- Trapped Mulgara
- Burrow
- Scat

Powerline Relocation - Type

- Overhead Powerline
- Underground Powerline
- Other Powerline

Vegetation Type

- AsTs:** Low open heath of *Acacia stellaticeps*, *Hybanthus aurantiacus* and *Corchorus incanus* over hummock grassland of *Triodia schinzii*, *Triodia epactia* and *Eriachne obtusa*
- AmTspp.XI:** Open shrubland of *Avicennia marina* and *Tecticornia* spp. over scattered sedges of *Xerochloa laniflora*

Proposed Great Northern Hwy B2/A Design

- Cadastral Boundaries

Powerline Point

- Powerline Point

Scale

0 37.5 75 150 225 300 375 Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 50

North Arrow

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Vegetation Type

Figure 3 - 1

Locality Map

PORT HEDLAND

1 2



LEGEND

Mulgara Locations

- Prints
- Trapped Mulgara
- Burrow
- Scat

Powerline Relocation - Type

- Overhead Powerline
- Underground Powerline
- Other Powerline

Vegetation Type

- AsTs:** Low open heath of *Acacia stellaticeps*, *Hybanthus aurantiacus* and *Corchorus incanus* over hummock grassland of *Triodia schinzii*, *Triodia epactia* and *Eriachne obtusa*
- AmT spp.XI:** Open shrubland of *Avicennia marina* and *Tecticornia* spp. over scattered sedges of *Xerochloa laniflora*

Proposed Great Northern Hwy B2/A Design

- Cadastral Boundaries

Powerline Point

- Powerline Point



0 37.5 75 150 225 300 375

Metres

Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 50

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Vegetation Type

Figure 3 - 2

4.5.2 Vegetation Extent and Status

A vegetation type is considered under-represented 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 clearing proposals in States where clearing is still occurring (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 give a comparable status.

Native vegetation types represented in the survey areas; their regional extent and reservation status are drawn from Shepherd, *et al.* (2002). These are shown in Table 2.

Table 2 Vegetation extent and status in the Pilbara IBRA region.

Vegetation Association Number	Association Description	Pre-European Extent (ha) in Pilbara IBRA region	Current Extent (ha) in Pilbara IBRA region	% Remaining	% Pre-European Extent in IUCN Class I-IV Reserves
647	Hummock grasslands, dwarf-shrub steppe; <i>Acacia translucens</i> over soft spinifex	196372.2	196372.2	100	0

The extent of vegetation in the survey areas is considered of Least Concern, i.e. intact with 100% of the pre-European extents of the vegetation type considered to be remaining.

4.5.3 Site Vegetation

Vegetation assessments have been completed for 6.7 km of the current Great Northern Highway route as it passes through Port Hedland (GHD, 2010). The flora and vegetation survey undertaken by GHD in 2010 confirmed that the study area has low to moderate species diversity, with 95 taxa from 37 families recorded. Of these, 90 taxa were native species and five were introduced.

4.5.4 Vegetation Condition Assessment

The vegetation condition of the wider Project area has been rated using the vegetation condition rating scale developed by Keighery (1994). This scale recognises the intactness of vegetation, which is defined by the following:

- ▶ Completeness of structural levels;
- ▶ Extent of weed invasion;
- ▶ Historical disturbance from tracks and other clearing or dumping; and
- ▶ The potential for natural or assisted regeneration.

The scale therefore consists of six rating levels as outlined below in Table 3.

Table 3 Vegetation condition rating scale (after Keighery, 1994).

Vegetation Condition Rating	Vegetation Condition	Description
1	Pristine or nearly so	No obvious signs of disturbance.
2	Excellent	Vegetation structure intact, disturbance affecting individual species, and weeds are non-aggressive species.
3	Very good	Vegetation structure altered obvious signs of disturbance.
4	Good	Vegetation structure significantly altered by very obvious signs of multiple disturbances retains basic vegetation structure or ability to regenerate it.

Vegetation within the study area was rated between *Excellent* and *Completely Degraded*. Areas of hummock grassland generally rated between *Excellent* to *Very Good* while Chenopod shrublands rated between *Very Good* and *Degraded* depending on the level of vehicle disturbance and rubbish. A large motocross track to the south of the Corridor is rated as *Completely Degraded*.

4.5.5 Threatened Ecological Communities

No TECs or PECs were recorded within the study area during the GHD (2010) flora and vegetation survey for the wider project area.

4.5.6 Significant Flora

Species of significant flora are protected under both State and Commonwealth legislation. Any activities that are deemed to have a significant impact on flora species that are recognised by the *EPBC Act*, and the *Wildlife Conservation Act 1950* can trigger referral to the SEWPaC and/or the EPA.

A search of the *EPBC Act* Protected Matters Search Tool did not identify any Commonwealth protected flora species within 10 km of either of the proposed Corridors.

In addition to the *EPBC Act*, significant flora in Western Australia is protected by the *Wildlife Conservation Act 1950*. This Act protects Declared Rare Flora (DRF) species. The DEC also maintains a list of Priority Listed Flora species. Conservation codes for Priority flora species are assigned by the DEC to define the level of conservation significance. Priority species 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 Priority flora, despite them not having formal legislative protection.

DEC database searches and field investigations undertaken during the GHD 2010 survey period did not locate any DRF or Priority species within the project area.

4.5.7 Mangroves

The Pilbara coastline supports the largest single unit of relatively undisturbed tropical arid zone habitats in the world (EPA, 2001). Mangroves along the Pilbara coastline are characterised by open woodlands and shrublands that are generally of lower productivity than mangrove communities of the wet tropics (EPA, 2001).

The proposed preliminary works to the north of Wedgefield are located in close proximity to areas mapped as supporting mangrove vegetation. Powerlines within intertidal areas will be located underground and will generally follow existing access tracks and cleared areas. No clearing of mangrove vegetation is proposed.

4.5.8 Weeds and Declared Plants

Weeds that are, or may become, a problem to agriculture can be formally classified as Declared Plants under the *Agriculture and Related Resources Protection Act 1976*. The Department of Agriculture and Food and the Agriculture Protection Board maintain a list of Declared Plants for Western Australia. If a plant is declared for the whole of the State or for particular Local Government Areas, all land holders are obliged to comply with the specific category control.

Five introduced species were recorded during the 2010 flora and vegetation survey. The survey results reported that the introduced species present in the project area included those that are naturalised and widespread in the Pilbara region, including Buffel Grass (*Cenchrus ciliaris*), Kapok (*Aerva javanica*), Date Palm (*Phoenix dactylifera*), Verano Stylo (*Stylosanthes hamata*) and Grain Sorghum (*Sorghum bicolor*). *Cenchrus ciliaris* was recorded throughout the study area during the 2010 survey and is denser in areas where there has been previous disturbance through vehicular tracks and clearing.

As the relocation of powerlines to underground will occur in an already modified environment the impacts of weed spread is expected to be minimal.

4.5.9 Dieback

Dieback refers to Phytophthora dieback which is an introduced plant disease called *Phytophthora cinnamomi*. The Department of Environment and Conservation (DEC - <http://www.dec.wa.gov.au/content/view/213/548/1/3/>) states that Phytophthora dieback is caused by a slow moving water mould that kills plant species in forests, woodlands and heathlands. Additionally, Phytophthora dieback is common throughout the entire southwest of Western Australia particularly in areas receiving more than 400 mm of annual rainfall between Jurien and east of Esperance.

The proposed development area is located in Port Hedland and in an area receiving less than 400 mm of annual rainfall, therefore dieback is not considered to have any impacts on the surrounding vegetation.

4.6 Fauna

GHD has previously completed a fauna survey of the wider project area (GHD, 2010). Briefly, a total of twenty one reptiles, six native mammals, four introduced mammals and forty two bird species were recorded.

Impacts to fauna from preconstruction works are expected to be minimal due to the ability of fauna to avoid the area during construction. However, the development and implementation of appropriate mitigation measures and management plans to minimise potential impacts is recommended. The following sections provide details of suitable fauna habitat and fauna species reported to inhabit the area.

4.6.1 Fauna Habitat

Habitat Types

The Project area includes a number of different fauna habitats, including:

- ▶ Open shrubland over hummock grasslands;
- ▶ Drainage lines;
- ▶ Chenopod shrubland; and
- ▶ Disturbed and cleared areas.

The area is dominated by open shrubland over hummock grasslands that were found to provide good fauna habitat, with a total of twenty one reptiles, six native mammals, forty two birds and several fiddler crab species being recorded. Additionally, two individual Mulgara individuals were recorded in vegetation type AsTs (Low open heath of *Acacia stellaticeps*, *Hybanthus aurantiacus* and *Corchorus incanus* over hummock grassland of *Tridodia schinzii*, *Tridodia epactia* and *Eriachne obtusa*).

Further, a number of ephemeral creeklines and tidal mudflats were reported by GHD (2010) to occur along the proposed development Corridor. The proposed development and associated construction activities may impact upon these however the development of appropriate mitigation measures and management plans are recommended to minimise impacts.

Habitat Value

Limited areas along the Corridor contain native vegetation in excellent condition, offering suitable habitat for native fauna. However, the Corridor also contains large areas that have been previously disturbed by clearing for tracks, roads, and infrastructure which has reduced the habitat value. As discussed in GHD (2010), vegetation type AsTs was found to support Mulgara, however native vegetation, including vegetation type AsTs, of similar type and condition is found outside the Corridor.

4.6.2 Significant Fauna Recorded from the Project Area

Mulgara

One species of significant fauna, Mulgara (*Dasycercus cristicauda*), was recorded during the fauna survey. This species is classified as Vulnerable under the *EPBC Act* and is included in Schedule 1 under the *Wildlife Conservation Act 1950*. Two male Mulgara were captured at the south-western end of the proposed Corridor. Additionally, Mulgara have previously been recorded in the area during surveys for the Hope Downs rail corridor (Biota, 2002a, 2002b).

Fiddler Crabs

Fiddler crabs (*Uca* spp.) were recorded within vegetation type AmTspp.XI (Open shrubland of *Avicennia marina* and *Tecticornia* spp. over scattered sedges of *Xerochloa laniflora*). Although these species are not listed under the *EPBC Act* or the *Wildlife Conservation Act 1950*, they are considered to be regionally significant. Given the vast areas of suitable habitat for Fiddler crabs in the surrounding area, and relatively small development footprint of the proposed road corridor, potential impacts on Fiddler crabs are not considered to be significant.

No evidence of other threatened fauna species was found during the field survey.

Marine and Migratory Birds

Several marine listed species were observed flying over the study area, including:

- ▶ Whistling Kite (*Haliastur sphenurus*);
- ▶ Brahminy Kite (*Haliastur Indus*);
- ▶ Black-faced Cuckoo-Shrike (*Coracina novaehollandiae*);
- ▶ Intermediate Egret (*Ardea intermedia*); and
- ▶ Little Egret (*Egretta garzetta*).

In addition, the following three species recognised as migratory were also observed flying over the study area:

- ▶ Osprey (*Pandion cristatus*);
- ▶ Rainbow Bee-eater (*Merops ornatus*); and
- ▶ Great Egret (*Ardea modesta*).

No nesting sites were found and the proposed corridor is not a critical habitat to the survival of these species.

4.6.3 Introduced Fauna

Four introduced species were observed during the 2010 field survey, these being:

- ▶ Fox;
- ▶ Cat;
- ▶ House Mouse; and
- ▶ One of the canid members (Dingo or wild Dog).

4.7 Surrounding Land Use

As reported in GHD (2010), the proposed Corridor will carry the Great Northern Highway around the west and north of the Wedgefield industrial area. This area was originally established in 1965 as a light industrial area, supporting small business, service industries and caretaker dwellings. Since then, the area has grown to include various general industrial uses (including 'noxious uses'). Wedgefield also hosts established camps used for short-term accommodation, typically by the transient workforce (PHLUMPSC, 2007).

4.8 Reserves and Conservation Areas

No reserves or conservation areas were reported to occur within the immediate vicinity of the proposed preliminary works.

4.8.1 Environmentally Sensitive Areas

A search of the DEC's Native Vegetation Map Viewer did not identify any Environmentally Sensitive Areas (ESAs).

4.9 European Heritage

GHD (2010) undertook a search of the EPBC Protected Matters Search Tool which indicated that there are three places on the Register of National Estates within approximately 10 km of the proposed Corridor, namely:

- ▶ Two Indigenous sites:
 - Nelson Point Site, WA;
 - South West Creek Area, WA; and
- ▶ One Natural site:
 - Coastal Islands Dixon Island to Cape Keraudren, WA.

None of these will be impacted by the realigned road and the associated preliminary works.

4.10 Indigenous Heritage

A number of other registered indigenous heritage sites and/or objects of heritage significance are located along the proposed GNH Corridor (Figure 2). Conditional approval to alter or destroy these sites was granted by the Minister for Indigenous Affairs under Section 18 of the *Aboriginal Heritage Act 1972* in February 2010. Prior to pre construction activities commencing all requirements of the Section 18 must be complied with. Conditions include a Cultural Heritage Management Plan approved by the Department of Indigenous Affairs.

4.11 Public Safety and Risk

The Great Northern Highway between Wedgefield and South Hedland includes three T-intersections. These intersections are considered to be hazardous to local traffic and long-haul road trains utilising the road (PHLUMPSC, 2007). The Port Hedland Land Use Master Plan recognised the planning work being undertaken by MRWA to identify a suitable alternative road alignment. The preconstruction activities are minor with limited access to the public. Provided that appropriate traffic management and signage to Main Roads standard is employed, the proposed works should not pose any significant risk to public health and safety.

5. Environmental Impacts and Management

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 preliminary works required for the realignment of the Great Northern Highway, Port Hedland.

The preliminary works required for the construction and operation of the realigned Great Northern Highway will involve activities that may lead to potential impacts on the environment. The discussion below gives details of the potential impacts of the preliminary works on each major environmental issue examined and gives a brief summary of the possible management strategies required to avoid or minimise the impacts.

Construction Phase Impacts

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

- Acid sulphate soils;
- Hydrology and water quality;
- Dust;
- Vegetation clearing and weed hygiene;
- Fauna management (particularly in relation to open trenches);
- Fire management;
- Noise;
- Pollution through the use of fuels, chemicals or from general construction rubbish; and
- Traffic management requirements.

These issues should be managed through the implementation of a Construction 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.

5.1 Acid Sulphate Soils

5.1.1 Potential Impacts

ASS risk has been mapped for the proposed realignment of the Great Northern Highway in Port Hedland. There is potential of acid generating soils in the area surrounding Wedgefield industrial estate. Additionally, it is known that approximately 1.2 km of the Corridor is within an area classified as having high to moderate risk of ASS within 3 m of the natural soil surface with no known ASS occurring in the remaining Corridor area.

ASS will be an environmental issue for the preliminary works where these soils need to be disturbed in earth-working activities such as the relocation of powerlines underground and culvert or areas of cut.

5.1.2 Management

The DEC's preferred approach is to characterise ASS materials *in situ* prior to commencement of development works in order to enable an effective management and treatment plan to be developed.

An ASS investigation should be undertaken and a comprehensive ASS management plan developed and implemented. The DEC has provided a range of guidelines on the investigation, assessment, treatment and management of ASS (DEC, 2006). These guidelines should be used when undertaking the ASS investigation and developing an ASS management plan.

This management plan should include management of groundwater, which will possibly be encountered during construction.

5.2 Surface Hydrology and Intertidal Areas

5.2.1 Drainage Impacts

The preliminary works required for the realignment of Great Northern Highway will intersect tidally inundated areas. In these areas there is the potential for alterations to local surface flow. This alteration may result in ponding or new areas of waterlogging.

5.2.2 Water Quality Impacts

Preliminary works could potentially cause extra runoff and pollution impacts. Pollutants may change the water quality of the surrounding intertidal areas which will impact on the organisms that rely on this water and habitat.

The greatest pollutant risk to intertidal areas from the preliminary works is accidental spills of chemicals or the release of other major pollutants, such as fuels. These releases could result in the deaths of flora and fauna including causing damage to the surrounding ecosystem. However, the risks of accidents impacting intertidal areas will be low if the risk of accidents occurring is minimised and if suitable clean-up procedures are put in place following any incident.

5.2.3 Management of Surface Hydrology and Intertidal Areas

Management strategies including the use of natural drainage networks such as contours and natural stormwater systems, as well as hydrocarbon management and spill response procedures should be documented in the CEMP. No refuelling or storage of fuels should be allowed within 50 m of creeklines or intertidal areas.

5.3 Vegetation and Flora

A large percentage of the vegetation within the preliminary works areas have been previously cleared for access and maintenance roads and the development of the Great Northern Highway. Loss of vegetation has a number of actual and potential impacts, including:

- ▶ Loss of flora and fauna biodiversity;
- ▶ Loss of fauna habitat;
- ▶ Death and injury to fauna;

- ▶ Changes to drainage;
- ▶ Increasing risks of water and wind erosion;
- ▶ Loss of visual appeal; and
- ▶ Introduction or facilitation of the spread of weed species.

No clearing of vegetation will be required for the geotechnical work however limited clearing of vegetation may be required for the relocation of powerlines to underground (cumulatively less than 1.5 ha). As the majority of preliminary works are anticipated to occur in already cleared areas (e.g. access roads) the impacts resulting from clearing will be minimal.

The proposed Project will not require clearing of mangrove vegetation (Main Roads, pers. comm, 3 March 2011).

5.3.1 Assessment against the Ten Clearing Principles

Any clearing of native vegetation will require a permit under Part V Division 2 of the *Environmental Protection Act 1986* (EP Act), except where an exemption applies under Schedule 6 of the Act or is prescribed by regulation in the *Environmental Protection (Clearing of Native Vegetation) Regulations 2004*, and it is not in an Environmentally Sensitive Area (ESA).

An assessment of the preliminary works against the “10 Clearing Principles” as outlined in Schedule 5 of the *Environmental Protection Amendment Act 2003* is provided in Appendix B. This assessment was undertaken to determine whether the proposed clearing is at variance to the Principles. These Principles aim to ensure that all potential impacts resulting from removal of native vegetation can be assessed in an integrated way.

This project is unlikely to be at variance with the 10 Clearing Principles, as limited clearing of vegetation is expected to be required.

5.4 Mulgara

Mulgara was observed within the study area during fauna surveys. This species is classified as Vulnerable under the EPBC Act and as Schedule 1 under the *Wildlife Conservation Act 1950*. The EPA has published a number of policies and guidelines relating to the identification and management of potential impacts on fauna. These include:

- ▶ Guidance Statement No. 33: Environmental Guidance for Planning and Development.
- ▶ Guidance Statement No. 56: Terrestrial Fauna Surveys for Environmental Impact Assessment in WA.
- ▶ Position Statement No. 3: Terrestrial Biological Surveys as an Element of Biodiversity Protection.

The objective of the EPA is to avoid injury and death from construction activities.

5.4.1 Potential Impacts to Mulgara

Potential impacts to fauna generally, and Mulgara specifically as a result of the preliminary works include:

- ▶ Direct loss of fauna within the local area during construction;
- ▶ Vehicle strike;

- ▶ Increased risk of fire; and
- ▶ Degradation of habitat due to the introduction or spread of weed species.

The relocation of powerlines to underground will require limited clearing of native vegetation. The location of Mulgara scats and burrows recorded during baseline surveys are in the vicinity of the clearing area for one of the relocation of powerlines. Due to the minimal amount of clearing required to complete this, impacts to Mulgara are expected to be minimal.

5.4.2 Management of Potential Impacts

Potential impacts to Mulgara and their habitat should be managed through the implementation of a Construction Environmental Management Plan (CEMP).

Management measures to be included in this Management Plan should include:

- ▶ Where possible, open trenches should be back-filled at the end of each day. Any trenches left open overnight must be inspected within three hours of sunrise each morning and any fauna trapped within the trench should be removed and released;
- ▶ Fauna egress ramps should be provided in all open trenches to prevent fauna from becoming trapped;
- ▶ Dead, standing or fallen timber will be retained and relocated to an adjacent vegetated area to provide fauna refuge, where possible;
- ▶ Native fauna encountered during clearing will be allowed to make their own way from the site. If this is not possible, a suitably qualified person will be allowed to relocate individuals;
- ▶ Any injured fauna encountered during clearing will be given to local animal carers or a local vet;
- ▶ Construction activities will avoid active Mulgara burrows where possible; and
- ▶ Where avoidance of burrows is not possible, targeted trapping and relocation by a suitably qualified and experienced fauna handler will be implemented.

The CEMP should outline details of the rehabilitation program to be undertaken, including rehabilitation of Mulgara habitat which may be degraded due to construction activities.

Given the localised areas required for the relocation of powerlines to underground and the extent of habitat disturbance in the surrounding area, the proposed preliminary works are not considered likely to have a significant impact on the Mulgara population.

5.4.3 Predicted Outcome

SEWPaC's *Policy Statement 1.1* (DEWHA, 2009) defines the significant impact criteria for vulnerable species. An action is considered likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will trigger one or more of these criteria. An evaluation of the likely impacts associated with the proposal against the significant impact criteria for vulnerable species is summarised in Table 4.

Table 4 Assessment of potential impacts against significant impact criteria.

Significant Impact Criteria	Evaluation
Lead to a long-term decrease in the size of an important population of a species	The proposal is not considered likely to result in a long-term decrease in the Mulgara population.
Reduce the area of occupancy of an important population	Limited vegetation clearing will be required for the purpose of this project, and therefore the proposal is considered unlikely to affect the area of occupancy of this species.
Fragment an existing important population into two or more populations	The surrounding landscape is considered to be relatively fragmented as a result of existing infrastructure and industrial developments within the local area. As limited vegetation will be cleared, fragmentation impacts from construction activities are not expected.
Adversely affect habitat critical to the survival of a species	Mulgara has a large distribution across central and central-western regions of Western Australia, as well as across south-west Queensland, the Northern Territory and South Australia. This project will require clearing of small areas of native vegetation totalling less than 1.5 ha. No long-term impact to Mulgara habitat are expected.
Disrupt the breeding cycle of an important population	Habitat fragmentation has the potential to restrict individuals of a species from accessing other members of the population. The project will require limited clearing of native vegetation and no long-term impacts to Mulgara habitat are expected. The proposal is not considered to pose a significant risk to the breeding cycle of the Mulgara population.
Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The project will require very limited clearing of native vegetation (totalling less than 1.5 ha). Further, habitat within the local area is already fragmented as a result of existing linear infrastructure and industrial developments.
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The project area has had some degree of disturbance and contains weeds that are relatively widespread throughout the Pilbara. The major weed of the area, Buffel grass, is widespread on adjacent tracks and disturbed areas and clearing will not create further weed spread. Construction activities are unlikely to cause appreciable degradation to adjoining land.
Introduce disease that may cause the species to decline	The project is not considered to pose any significant risks associated with the introduction of diseases.
Interfere substantially with the recovery of a species	Mulgara has a large distribution across central and central-western regions of Western Australia, as well as across south-west Queensland, the Northern Territory and South Australia. The project will require limited clearing of native vegetation but is not considered to pose a risk to the recovery of the species.

Based on the assessment of likely impacts to Mulgara against the Significant Impact Criteria (Table 4), the proposal is not considered likely to have a significant impact on this species, and as such it is not proposed to refer the proposal under the *Environment Conservation and Biodiversity Act 1999*.

5.5 Indigenous Heritage

Aboriginal monitors will be required to be present during all ground disturbing activities.

Some provision should be made in the event of the discovery of subsurface archaeological material during excavation and earthworks for any future ground disturbance. This may occur where no surface archaeological material is present.

All site personnel should undertake appropriate site inductions detailing their responsibilities for maintaining and reporting of indigenous heritage artefacts prior to commencing site works.

5.6 Visual Amenity

The area of the proposed preliminary works is generally industrial and it is considered that a change to the visual amenity of the area is not a key factor. Further, the construction works would only be visible from the road and once complete would remove the visible above ground powerlines. Therefore, whilst some visible impact for road users would occur during preliminary works, long-term visual impacts would be significantly reduced due to the removal of the above ground power lines.

5.7 Air Quality

Dust levels within the Port Hedland townsite have historically, and still are, above the recommended levels (EPA, 2009).

The preliminary works are likely to result in dust emissions during the relocation of above ground powerlines to underground however it is considered that these impacts will be minimal due to the localised nature of works. Impacts during construction can be managed using standard dust suppression techniques. No long-term impacts associated with air quality are expected.

5.8 Noise

The preliminary works is located along the proposed Great Northern Highway realignment Corridor to the north and west of the existing Wedgefield industrial area. Although the Wedgefield area is predominantly industrial, the area also supports established camps used for short-term transient workforce accommodation (PHLUMPSC, 2007). Construction activities are unlikely to result in nuisance noise or vibration impacts due to there being very few sensitive receptors within the vicinity. Construction activities will need to be managed to ensure compliance with Regulation 13 of the *Environmental Protection (Noise) Regulations 1997*.

6. Requirement for Statutory Approvals

6.1 Commonwealth Approvals

Referral to SEWPaC under the *EPBC Act* is required for actions that are likely to have a significant impact on:

- A matter of national environmental significance;
- The environment of Commonwealth land (even if taken outside Commonwealth land);
- The environment anywhere in the world if the action is undertaken by the Commonwealth.

The seven matters of national environmental significance are:

- World Heritage properties;
- National heritage places;
- Ramsar wetlands of international significance;
- Threatened species and ecological communities;
- Migratory species;
- Commonwealth marine area;
- Nuclear actions (including uranium mining).

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*.

6.2 State Approvals

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

6.3 Other Permits and Licences

6.3.1 Clearing Permit

Main Roads WA has been granted a statewide vegetation clearing permit (Purpose Permit CPS 818-5), granted under section 51E of the *Environmental Protection Act (1986)*, from the Department of Environment and Conservation. The Purpose Permit allows Main Roads WA to clear native vegetation for road realignment projects and associated construction activities (including preconstruction activities). Any clearing of native vegetation must be assessed against the “Ten Clearing Principles” outlined in the permit. The Permit does not authorise the clearance of native vegetation for project activities where:

- The clearing may be seriously at variance with the clearing principles; or
- Those project activities are incorporated in any proposal that is referred to and assessed under Part IV of the *Environmental Protection Act 1986* by the EPA.

Assessment of the proposed preliminary works against the “Ten Clearing Principles” is also provided in the MRWA Vegetation Clearing Impact Assessment Report attached as Appendix B. On the basis of this assessment and the absence of any ESA; it is considered that clearing for the preliminary works is unlikely to be at variance with the clearing principles. Therefore, clearing for preliminary works is considered possible in accordance with Main Roads State-wide purpose “Clearing Permit” (CPS 818-5).

The main conditions of the Permit include:

- avoiding and minimising clearing impacts;
- not exceeding any of the annual regional clearing limits;
- preparing a Preliminary Environmental Impact Assessment (PEIA) (assessing clearing impacts against the Ten Clearing Principles);
- undertake stakeholder consultation (where variance with the Ten Clearing Principles occurs);
- provision of offsets (where variance with the Ten Clearing Principles occurs);
- preparing an Environmental Impact Assessment (EIA) (maybe done instead of PEIA) (where variance occurs);
- preparing an Environmental Management Plan (EMP) (where variance occurs);
- preparing a revegetation plan for temporary clearing (and submit to DEC if temporary clearing is >0.5ha);
- implement weed and dieback management;
- recording;
- auditing and/or reporting; and/or
- regional limits on the amount of clearing.

6.3.2 Groundwater Abstraction Licence

The project area is located within the Pilbara groundwater area proclaimed under the *Rights in Water and Irrigation Act 1914*. Should dewatering be required during construction (ie for installation of underground power services), MRWA will be required to obtain a Licence to Take Groundwater under Part 5C of the *Rights in Water and Irrigation Act 1914*.

7. Management Recommendations

7.1 Environmental Management Plans

7.1.1 Construction Environmental Management Plan

A Construction Environmental Management Plan (CEMP) should be developed to manage the potential environmental impacts of construction activities associated with geotechnical activities and the relocation of powerlines to underground.

The CEMP should address the following environmental aspects, as a minimum to ensure that the construction of the project occurs with minimal impact on the immediate and surrounding environment.

- ▶ Weed control measures such as Weed Inspection and Wash-down procedures for equipment entering the site to prevent the introduction and/or spread of weeds;
- ▶ Vegetation management actions to protect unintentional or unnecessary impact on the vegetation adjacent to the construction area, as well as rehabilitation where appropriate;
- ▶ Dust and air quality management actions, with particular reference to the sensitive receptors in close proximity to the site;
- ▶ Hydrocarbon spill prevention where appropriate, clean-up and remediation;
- ▶ Traffic management;
- ▶ Emergency response;
- ▶ Indigenous heritage;
- ▶ Where appropriate noise and vibration management, with particular reference to the sensitive receptors in close proximity to the site; and
- ▶ Safety and transport management actions where appropriate.

7.1.2 Fauna (Mulgara) Management Plan

A Fauna Management Plan has previously been prepared for the proposed reconfiguration of the Great Northern Highway and was included in the information submitted with referral documentation to the EPA and SEWPAC. The management plan outlines management actions for pre-construction and construction phases of the project. These management actions will also apply during preliminary works associated with geotechnical investigations and powerline relocation.

7.2 Management of Other Factors

Management of other factor such as vegetation will be managed through a (CEMP), in conjunction with existing MRWA standard management procedures.

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Appendix A

Section 18 Consent

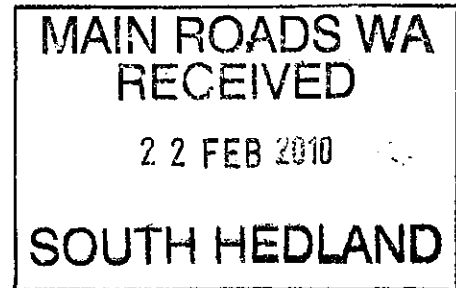


**Deputy Premier of Western Australia
Minister for Health; Indigenous Affairs**

SPM Pyke

Our Ref: 25-09620

Mr Ian Fennell
Regional Manager, Pilbara Region
Main Roads Western Australia
PO Box 2256
SOUTH HEDLAND WA 6722



Mr Andre Bush
Chief Executive Officer
Port Hedland Port Authority
PO Box 2
PORT HEDLAND WA 6721

CORRESPONDENCE	
<input type="checkbox"/> Doc No	<u>DIO # 43162</u>
<input type="checkbox"/> File	<u>08/90</u>
<input type="checkbox"/> Action	<u>SPM (FYI)</u>
<input type="checkbox"/> Action	<u>D. Pearson</u>
<input type="checkbox"/> Distribute to	
<input type="checkbox"/> RO Action Complete	

Dear Mr Fennell and Mr Bush

I refer to the section 18 notice ("the Notice") dated 16 October 2009 submitted by Main Roads Western Australia and the Port Hedland Port Authority ("the Applicants") on behalf of the Minister for Lands for the State of Western Australia and the Port Hedland Port Authority ("the Landowners") to the Aboriginal Cultural Material Committee ("ACMC") pursuant to section 18(2) of the *Aboriginal Heritage Act 1972* ("AHA"). The Notice was considered at the 2 December 2009 ordinary meeting.

The Notice advised that you wish to use the land described in Item 4 of the Notice as a portion of Lot Forrest Loc 370; a portion of Lot 3261 (Reserve No. 33848); a portion of Lot 556, Town of Port Hedland ("the Land"), for the purpose described in Item 6 of the Notice as the Great Northern Highway realignment at Port Hedland ("the Purpose").

In accordance with my powers under section 18(3) of the AHA and following consideration of recommendations from the ACMC, I hereby grant consent to the use of the Land for the Purpose subject to the conditions set out below.

I am advised that based on current knowledge the Purpose will impact upon 14 Aboriginal sites within the meaning of section 5 of the AHA ("Sites") on the Land. The Sites are DIA 27813 (MAI-09-MD-01), DIA 27814 (MAI-09-MD-03), DIA 27815 (MAI-09-MD-04), DIA 27818 (MAI-09-MD-11), DIA 27819 (MAI-09-MD-12), DIA 27820 (MAI-09-MD-13), DIA 27822 (MAI-09-MD-15), DIA 27826 (MAI-09-MD-19), DIA 27828 (MAI-09-MD-21), DIA 27833 (MAI-09-MD-26), DIA 27835 (MAI-09-MD-28), DIA 27837 (MAI-09-MD-30), DIA 27838 (MAI-09-MD-31) and DIA 27841 (MAI-09-AS-01).

Conditions of Consent

That the Applicants (on behalf of the Landowners):

1. In consultation with the Aboriginal people consulted as part of the preparation of this section 18 notice ("the Consultants") develop a Cultural Heritage Management Plan (CHMP), to the satisfaction of the Registrar of Aboriginal Sites ("the Registrar"), prior to the commencement of ground disturbance works. The CHMP will include but not be limited to:
 - a. The management Aboriginal heritage issues, including the minimisation of the number of Aboriginal archaeological sites to be impacted and the extent to which impact occurs as well as mechanisms for minimising disturbance to registered Aboriginal site DIA 22874 (Marapikurrinya Yintha), including mangroves.
 - b. A detailed plan for the excavation, storage and analysis of archaeological/shell material from the following sites: DIA 27813 (MAI-09-MD-01); DIA 27005 (MAI-09-MD-02); DIA 27814 (MAI-09-MD-03); DIA 27815 (MAI-09-MD-04); DIA 27009 (MAI-09-MD-05); DIA 24995 (MAI-09-MD-06/07); DIA 25005 (MAI-09-MD-08); DIA 27820 (MAI-09-MD-13); DIA 27822 (MAI-09-MD-15); DIA 27826 (MAI-09-MD-19); DIA 27835 (MAI-09-MD-28); DIA 27837 (MAI-09-MD-30); DIA 27838 (MAI-09-MD-31); DIA 27841 (MAI-09-AS-01) and DIA 23605. Where a site is partially impacted by works associated with the Purpose, only the impacted site portions are to be subjected to salvage/archaeological excavation.
 - c. A detailed plan for the salvage and storage of archaeological/shell material from the following sites: DIA 27818 (MAI-09-MD-11); DIA 27819 (MAI-09-MD-12); DIA 27828 (MAI-09-MD-21); DIA 27833 (MAI-9-MD-26); DIA 23606; DIA 23610; DIA 23612 and DIA 27007. Where a site is partially impacted by works associated with the Purpose, only cultural materials located within the impacted site portions are to be salvaged.
- The plan is to be applied during the course of the carrying out of the Purpose.
- The proponent is to ensure that at least two members of the Consultants selected by MPL are engaged for the monitoring, excavation and salvage programmes.
2. Immediately cease carrying out the Purpose if human skeletal remains ("Remains") are found and report the matter to the Western Australia Police and the Registrar. Where it is determined that the Remains are Aboriginal in origin and not a police matter, they must remain *in situ* and undisturbed until the Registrar makes a decision about how to proceed in respect of the Remains. The Landowner must at its expense manage the Remains in accordance with the Registrar's decision and notify the whereabouts of the Remains to the Registrar.

3. Provide to the Registrar annually, or at the completion of the Purpose if the Purpose is completed within one year, a written report advising the Registrar whether and to what extent the Purpose has impacted on all or any Sites or objects within the meaning of section 6 of the AHA ("Objects") that may be located on the Land and to assist the ACMC to reassess the status of the Sites. This report is to include a detailed description of:
 - a. whether such Sites or Objects have been partially or entirely impacted by the Purpose;
 - b. the level, type and effect of any such impact (including, where possible, the provision of photographs taken during and after the impact); and
 - c. where Sites or Objects have been salvaged, when and how such salvage took place, who was present at the salvage and, subject to issues of cultural confidentiality, to where the material was re-located.

This condition should not be construed as preventing the proponent from advising the Registrar in writing of all or any of the matters outlined above at any time prior to the completion of the Purpose. The Registrar and the ACMC welcome the provision of comprehensive and ongoing information about Sites and Objects in Western Australia.

Failure to comply with these conditions may constitute an offence under section 55 of the AHA. DIA carries out routine checks on compliance with conditions of Ministerial consents.

Requests and Advice

The following information has been provided by the ACMC for the information and guidance of the Landowner (or authorised Agent) and does not constitute a condition of consent.

The ACMC requests that the Landowner (or authorised Agent) give due consideration to requests made by the Aboriginal people consulted about the Purpose regarding the protection of Aboriginal heritage and the recognition of Aboriginal culture and history. For example, recognition of Aboriginal heritage values, beliefs and prior occupation of the area may be conveyed through interpretive signage, street naming or murals.

In addition, the Landowner (or authorised Agent) should make all persons employed or engaged in respect of the Purpose aware of their obligations under the AHA. The Landowner (or authorised Agent) should insert into all and any relevant contracts, project plans, scopes of works, tenders and other similar documents, a requirement that such persons should examine relevant information on the DIA website at:

- <http://www.dia.wa.gov.au/Heritage--Culture/>

Right of Review of Decision

Where the Landowner (or authorised Agent) is aggrieved by a decision of the Minister made under section 18(3) of the AHA, the Landowner may apply to the State Administrative Tribunal for a review of the decision. The Tribunal's website is www.sat.justice.wa.gov.au.

Other Matters

This consent can only be relied upon by the Landowner (or authorised Agent). Any subsequent owner of the land within the meaning of the AHA must make their own application under the AHA.

Copies of the AHA, the *Aboriginal Heritage Regulations 1974* and the *State Administrative Tribunal Act 2004* may be viewed and downloaded from the website of the State Law Publisher at www.slp.wa.gov.au.

If you have any queries in relation to your application, please contact Mr Ryan Crawford, DIA Senior Heritage Officer, on 9235 8117.

Yours sincerely



**Dr Kim Hames MLA
DEPUTY PREMIER
MINISTER FOR INDIGENOUS AFFAIRS**

cc. Minister for Lands for the State of Western Australia
c/- Manager Kimberley – Pilbara Region
State Land Services
PO Box 1575
MIDLAND WA 6936

17 FEB 2010

Appendix B

MRWA Vegetation Clearing Impact Assessment Report

MRWA Vegetation Clearing Impact Assessment Report

1. Area Under Assessment Details

Proponent details

Proponent's name:

MRWA

Contacts:

Name: Elizabeth Chandler
Phone: (08) 9323 4483
Fax: (08) 9323 4930
Email: elizabeth.chandler@mainroads.wa.gov.au

Property details

Property:

Colloquial name:

Area under assessment

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:	Site Plan Attached
Approximately 1.5 ha	unknown	Mechanical removal	Installation of underground services	Yes

Avoidance/Minimise clearing

How have the clearing impacts been minimised?

A CEMP should be developed for the project to minimise impacts on native vegetation and fauna habitat. Clearing of native vegetation will be limited to that necessary for installation of the groundwater power supply.

There will be no clearing required for geotechnical investigations.

Relocation of existing overhead powerlines will require trenching for installation of underground power services and other infrastructure. These works are generally located in previously cleared areas, however some disturbance of remnant vegetation will be required. The total area of disturbance for relocation of the power infrastructure is less than 1.5 ha.

2. Background

Existing environment and information

The study sites fall within the Roebourne subregion of the Pilbara Biogeographic region of Western Australia. The environment of this subregion has been described as coastal and sub-coastal plains with a grass savannah of mixed bunch and hummock grasses and dwarf shrub steppe of *Acacia stellaticeps* or *A. pyrifolia* and *A. inaequilatera* (Kendrick and Stanley, 2001). The uplands of the region support *Triodia* hummock grasslands and the ephemeral drainage lines support *Eucalyptus victrix* or *Corymbia hamersleyana* (Kendrick and Stanley, 2001).

The major vegetation system association occurring within the project area has been mapped by Beard (1975) as "Hummock grasslands, dwarf-shrub steppe; *Acacia translucens* (now *A. stellaticeps*) over soft spinifex".

Two vegetation types were recorded from the study area:

- ▶ **AsTs:** Low open heath of *Acacia stellaticeps*, *Hybanthus aurantiacus* and *Corchorus incanus* over hummock grassland of *Triodia schinzii*, *Triodia epactia* and *Eriachne obtuse*;
- ▶ **AmTspp.XI:** Open shrubland of *Avicennia marina* and *Tecticornia* spp. over scattered sedges of *Cyperus* sp; and

The remainder of the study area is mapped heavily disturbed / predominantly cleared areas with some disturbance opportunists such as **Cenchrus ciliaris* present.

No clearing will be required for geotechnical investigations.

The location of preliminary works associated with relocation of existing overhead power lines are generally on existing tracks and/or completed degraded areas. However, small areas of AsTs vegetation will be impacted (areas shown in Inset 3 and Inset 4 on Figure 1). Vegetation condition within these areas is considered to be *Very Good* to *Excellent*. No clearing of mangrove vegetation (AmTspp.XI) will be required (Main Roads, pers. comm, 3 March 2011).

3. Assessment of application against Clearing Principles

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

Comments

The proposal is unlikely to be at variance with the Principle.

The study area contains a low to moderate level of species diversity, 95 taxa from 37 families were recorded.

One vegetation type mapped by Beard (1975) was recorded within the study area. The vegetation type covers approximately 196,000 ha across the Pilbara (Shepherd, 2005) and is considered to be close to 100% intact.

Methodology

- ▶ Review of flora and fauna assessment completed for the relocation of the Great Northern Highway of Port Hedland (GHD, 2010);
- ▶ DEC Rare and Threatened Flora database;
- ▶ Beard (1975) Vegetation Survey of Western Australia;
- ▶ Shepherd (2005) vegetation extents.

(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

The proposal is unlikely to be at variance with the Principle.

The area is known to support Mulgara, which are listed as Vulnerable under the EPBC Act and as Schedule 1 under the *Wildlife Conservation Act 1950*. Minor, linear disturbance of the native vegetation type AsTs, which is considered Mulgara habitat, will occur in 3 locations during construction / trenching. The total area of disturbance associated with the project is approximately 1.5 ha.

Methodology

- ▶ Review of flora and fauna assessment completed for the relocation of the Great Northern Highway of Port Hedland (GHD, 2010);

- ▶ WA Museum / DEC NatureMaps Database;
- ▶ DEC Threatened Fauna database; and
- ▶ EPBC Protected Matters Search Tool.

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

Comments	<p>The proposal is unlikely to be at variance with the Principle.</p> <p>No Declared Rare flora species are known from the general area. Some Priority species could potentially occur at the site, however none were recorded during the GHD (2010) field survey.</p>
Methodology	<ul style="list-style-type: none"> ▶ Review of flora and fauna assessment completed for the relocation of the Great Northern Highway of Port Hedland (GHD, 2010); ▶ DEC Rare and Threatened Flora database; ▶ EPBC Protected Matters Search Tool.

(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	<p>The proposal is unlikely to be at variance with the Principle</p> <p>No TECs are known to occur within or adjacent to the study area.</p>
Methodology	<ul style="list-style-type: none"> ▶ Review of flora and fauna assessment completed for the relocation of the Great Northern Highway of Port Hedland (GHD, 2010). ▶ DEC's Threatened and Priority Ecological Community Database; ▶ EPBC Protected Matters Search Tool;

(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	<p>The proposal is unlikely to be at variance with the Principle</p> <p>The major vegetation system association occurring within the project area has been mapped by Beard (1975) as "Hummock grasslands, dwarf-shrub steppe; <i>Acacia translucens</i> (now <i>A. stellaticeps</i>) over soft spinifex".</p> <p>The extent of the vegetation in the survey areas is considered of Least Concern, i.e. intact, with 100% of the pre-European extents of the vegetation type considered to be remaining.</p>
Methodology	<ul style="list-style-type: none"> ▶ Review of flora and fauna assessment completed for the relocation of the Great Northern Highway of Port Hedland (GHD, 2010); ▶ Beard (1975) vegetation mapping; ▶ Shepherd (2005) vegetation extents.

(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	<p>The proposal is unlikely to be at variance with the Principle</p> <p>One area of tidal mudflats enter the proposed project area and support Mangrove species <i>Avicennia marina</i> and several <i>Tecticornia species</i>. Alignment will follow cleared areas and</p>
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will not impact these species. No clearing of mangrove vegetation (AmTspp.XI) will be required (Main Roads, pers. comm, 3 March 2011).

Methodology

- ▶ Review of flora and fauna assessment completed for the relocation of the Great Northern Highway of Port Hedland (GHD, 2010).
- ▶ EPBC Protected Matters Search Tool.

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

Comments

The proposal is unlikely to be at variance with the Principle

Limited vegetation clearing is required for the proposed works.

The major weed of the area, Buffel grass is widespread on adjacent tracks and disturbed areas. The placement of powerlines underground will not create further weed spread.

Methodology

- ▶ Review of flora and fauna assessment completed for the relocation of the Great Northern Highway of Port Hedland (GHD, 2010);
- ▶ Desktop assessment.

(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

The proposal is unlikely to be at variance with the Principle.

There are no conservation areas within the vicinity of the alignment options.

Methodology

- ▶ DEC Estate spatial datasets;
- ▶ EPBC Protected Matters Search Tool.

(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

The proposal is unlikely to be at variance with the Principle.

Limited clearing is required. Therefore there may be minimal amounts of runoff from the area into the saline coastal tidal zones during, and immediately following construction activities. Trenches will be backfilled to existing ground level and will not impact surface or groundwater in the long term.

Methodology

- ▶ Desktop assessment.

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

Comments

The proposal is unlikely to be at variance with the Principle.

Limited clearing is required and no impacts on incidence or intensity of flooding are anticipated.

Methodology

- ▶ Desktop assessment.

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

Comments

It is understood that MRWA referred the reconfiguration of the Great Northern Highway to the EPA under Section 38 of the Environmental Protection Act 1986. The EPA determined that the proposal does not require formal assessment under the Act (not assessed - public advice given).

The project area is located within the Pilbara groundwater area proclaimed under the *Rights in Water and Irrigation Act 1914*. Should dewatering be required during construction (ie for installation of underground power services), MRWA will be required to obtain a Licence to Take Groundwater under Part 5C of the *Rights in Water and Irrigation Act 1914*.

Methodology

Preliminary Environmental Impact Assessment has been undertaken to determine permit and licences likely to be required.

4. Assessor's recommendations

List of Principles seriously at variance, at variance or maybe at variance

The proposal is unlikely to be at variance with the 10 clearing principles. In total, three linear disturbances totalling approximately 1.5 ha of vegetation type AsTs (Mulgara habitat), will be required to be cleared. Given the small amount of clearing required for the preliminary works, impacts to Mulgara habitat are not expected to be significant.

Recommendation (does this clearing require a Revegetation Management Plan / Offset Proposal / Environmental Management Plan / Management Strategy/New Application, under CPS 818/2)

On the basis of this assessment and the absence of any ESAs; it is considered that clearing for the preliminary works is unlikely to be at variance with the clearing principles.

Clearing for preliminary works is considered possible in accordance with Main Roads State-wide purpose "Clearing Permit" (CPS 818-5).

It is recommended that a Construction Environmental Management Plan is developed for the project to minimise impacts on fauna and vegetation. The CEMP should address the following environmental aspects, as a minimum:

- Weed hygiene and control measures;
- Vegetation management actions to protect unintentional or unnecessary impact on the vegetation adjacent to the construction area, as well as rehabilitation where appropriate;
- Dust and air quality management actions, with particular reference to the sensitive receptors in close proximity to the site;
- Hydrocarbon spill prevention where appropriate, clean-up and remediation;
- Traffic management;
- Emergency response;
- Indigenous heritage;
- Where appropriate noise and vibration management, with particular reference to the sensitive receptors in close proximity to the site; and
- Safety and transport management actions where appropriate.

5. References

Beard, J.S. (1975). Vegetation Survey of Western Australia, 1:1,000,000 Series. Pilbara: The Vegetation of the Pilbara Area. University of Western Australia Press, Nedlands.

GHD (2010). Report for the Reconfiguration of the Great Northern Highway, Port Hedland: Flora and Fauna Assessment. July 2010. MRWA client report.

Kendrick, P. and Stanley, F. (2001) *A Biodiversity Audit of WA: Pilbara 4 (PIL4 – Roebourne synopsis)* Report prepared for the Department of Environment and Conservation, October 2001.

Shepherd, D.P. (2005) Personal Communication. Information updated from above reference, and available in database form.

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Document Status

Rev No.	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
0	L. Hack D. Taylor	B. Skarratt		B. Skarratt		14/03/11
1	L. Hack D. Taylor	B. Skarratt		B. Skarratt		21/03/11