Southern Gateway Alliance

Lakes Road East –Perth to Bunbury Highway

Preliminary Environmental Impact Assessment

October 2007

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Executive Summary

Southern Gateway Alliance (SGA) has prepared this Preliminary Environmental Impact Assessment (PEIA) for the proposed construction of a connection of the New Perth Bunbury Highway / Lakes Road Interchange to the existing Lakes Road to the east. The proposed project area is shown at Figure 1. The Project involves the clearing of approximately 7ha of degraded vegetation.

The New Perth Bunbury Highway (NPBH) project has been approved by the State Government under the *Environmental Protection Act 1986* and by the Commonwealth Government under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). These approvals excluded the proposed Lakes Road East component of the project as the concept design for the planned works had not been completed at the time the project was formally assessed.

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

- topography, hydrology and soils;
- vegetation
- weed management;
- significant fauna;
- indigenous heritage;
- non-indigenous heritage;
- land use; and
- construction phase impacts.

In addition to desktop assessments, the results of flora and fauna surveys performed by SGA in October 2006 have been drawn upon to ensure that aspects of biological/ecological significance have been identified.

The construction of the Lakes Road East section will be conducted congruent with approved environmental management plans prepared for the NPBH project, and developed in conjunction with the Department of Environment and Conservation (DEC) and Department of Water. These plans include:

Generic Acid Sulphate Soil management Plan

Vegetation Management Plan

Dieback and Weed Management Plan

Topsoil Management Plan

Surface Water Management Plan

Construction Management Plan

Aboriginal Heritage Management Plan

The results of this PEIA and assessment of the project against the Ten Clearing principles indicates the clearing required for the development of the Lakes Road east project is not at variance with the principles. Consequently the clearing can be conducted under the provisions of Main Roads Statewide Purpose Clearing Permit (818/3).

1. Introduction

The 70km New Perth Bunbury Highway (NPBH) has been planned since the 1980s as a strategic road link between Perth and the south west of Western Australia. The NPBH project is a Commonwealth and State funded infrastructure project with construction commencing at some sections in March 2007 and scheduled completion in December 2009. The project is being constructed by the Southern Gateway Alliance (SGA), comprising Leighton Contractors, W.A. Limestone, GHD and Main Roads Western Australia.

The NPBH project has been approved by the State Government under the *Environmental Protection Act 1986* and by the Commonwealth Government under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The works subject to the above approval excluded the proposed Lakes Road East component of the project as the concept design for the planned works had not been completed at the time the project was formally assessed by the EPA.

The construction of the Lakes Road East section will be conducted congruent with approved environmental management plans prepared for the NPBH project, and developed in conjunction with the Department of Environment and Conservation (DEC) and Department of Water.

Southern Gateway Alliance (SGA) have prepared this Preliminary Environmental Impact Assessment (PEIA) for the proposed Lakes Road (East) project. The project will involve construction of approximately 2500m of single lane road to connect the NPBH / Lakes Road Interchange to the existing Lakes Road to the east and Fowler Road to the north.

This PEIA seeks to determine and assess the potential environmental impacts of the proposed works within the project area.

The project area is located within the Shire of Murray and is shown at Figure 1.

1.1 Scope of Report

This PEIA has been prepared to conform with the Main Roads WA standard brief and:

- Identifies and reviews any existing relevant reports;
- Conducts an initial assessment to determine the key environmental aspects for the road proposal;
- Undertakes a site visit to conduct a survey of the vegetation present within the project area; and
- Assesses the project against the Department of Environment and Conservation's (DEC's) 10 Clearing Principles (Schedule 5);
- Assesses all environmental aspects likely to interest the Department of Environment and Conservation (DEC) or 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 advises whether the project should be referred to the Commonwealth Department of the Environment and Water Resources (DEWR);
- Determines (but does not apply for) clearances required under other legislative provisions, including (but not limited to) those required under the following Acts;
    - *Conservation and Land Management Act 1984*;
    - *Wildlife Conservation Act 1950*;
    - *Environmental Protection Act 1986*;
    - *Rights in Water and Irrigation Act 1914*;
    - *Heritage of Western Australia Act 1990*;
    - *Aboriginal Heritage Act 1972*; and
    - *Environmental Protection and Biodiversity Conservation 1999*
- Provides a concise report on the findings.

Based on the information available to SGA and database/literature reviews the environmental and social aspects considered and discussed in this PEIA include:

- Geology;
- Landforms and soils;
- Hydrology;
- Vegetation and flora;
- Weed management;
- Fauna;
- Aboriginal heritage;
- European heritage;
- Land use; and
- Construction phase impacts.

2. Existing Environment and Expected Impacts

The environmental and social issues considered relevant to this project are outlined on a topic-by-topic basis in the following section. Each of the topics include a baseline environmental description, and where appropriate is followed by a preliminary assessment of potential environmental constraints and recommendation to MRWA.

2.1 Topography and Geology

The project area is located within the Perth geological region. The Australian Soil Resource Information System (ASRIS, 2007) describes the landforms of this region as low dissected plateaus; dune fields; alluvial plains in the south.

Reference to the DEC Groundwater Atlas indicates the project area is located within an area of gently undulating land approximately 3m - 5m Australian Height Datum (AHD). The surface geology of the project area consists of Bassendean Sand: quartz sand (dunes) and Guildford Clay: alluvium (clay, loam, sand and gravel (Department of Industry and Resources, Geological Survey Western Australia, 1980).

2.2 Hydrology

2.2.1 Groundwater

Reference to the Department of Water (DoW) *Geographic Data Atlas* indicates the project area is within the Murray Groundwater Area, sub area Nambeelup. Groundwater within the project area is between 1m – 4m below ground level (BGL). The salinity of the groundwater is brackish at 1000-1500 mg/L TDS.

2.2.2 Wetlands and Surface Water

The project area is located approximately 400m south-east of the Serpentine River, which is a mapped as a Conservation category wetland by the Department of Environment and Conservation. An additional four Resource Enhancement Wetlands are located within 130-800m of the New Lakes Road (East) site. Given the proximity of these wetlands to the proposed New Lakes Road (East) site, it is considered unlikely that these wetlands will be impacted during the construction or post-construction phases of the project.

The *Environmental, Protection and Biodiversity Conservation Act* Protected Matters Search tool indicates the project area is within 10km of the Ramsar listed Peel-Yalgorup system and within the Becher Point Wetlands, and Forrestdale & Thompson Lakes catchment areas.

2.3 Acid Sulphate Soils

Acid Sulphate Soils (ASS) are naturally occurring soils containing iron sulphides. These soils are typically benign within the anaerobic environment of their formation.

However, when they become oxidised through various disturbances, acidic soil, surface water and groundwater can result. The sulphuric acid also breaks heavy metal bonds, releasing metals such as aluminium, iron, and arsenic into groundwater.

The main environmental indicator of ASS is shallow groundwater and/or waterlogging of laterites and sands, which may have generated sulphuric conditions, which lead to acid sulphate soils. The project area is known to be within a region in which potential or actual ASS are known to occur.

A review of the West Australian Planning Commission (WAPC) Planning Bulletin Number 64, Acid Sulphate Soil Risk Mapping (Western Australia Planning Commission 2003) indicated that the project area has a Class 2 ASS risk (moderate to low risk of ASS occurring <3m from soil surface).

2.4 Vegetation and Flora

2.4.1 Vegetation Type, Condition, Extent and Status

Broad scale vegetation mapping by Heddle et al., (1980), at a scale of 1:250, 000, indicates the following pre-European vegetation complex present within the project area:

Table 1 Pre-European vegetation complexes of the project area as described by Heddle *et al.*, (1980).

Vegetation Complex	Description
44: Aeolian Deposits: Bassendean Complex – Central and South	Vegetation Ranges from woodland of *Eucalyptus marginata* (Jarrah)-*Casuarina fraseriana* (Sheoak)-*Banksia* ssp. to low woodland of *Melaleuca* ssp. and sedgelands on the moister sites.

The Field survey identified two vegetation complexes, the Southern River Complex and Herdsman Complex (Heddle, E.M. *et al.*, 1980). These are described in **Table 2**. In addition, a significant portion of the New Lakes Road (East) site was found to be cleared or mostly cleared of vegetation (GHD 2006) as shown at Figure 2. Construction of Lakes Road (East) will require the clearing of approximately 71 trees.

Vegetation Condition

The site has been previously used for farming activities and now supports a sparsely vegetated, parkland cleared vegetation. Based on the Vegetation Condition Rating (Government of Western Australia, 2000) the site vegetation was considered to be Vegetation Condition Rating 5 ie" Degraded – Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management."

The condition of the site vegetation is shown at Figure 2.

Vegetation Extent

A vegetation type is considered to be under-represented if there is less than 30 percent of its original distribution remaining. From a biodiversity perspective, and taking no account of any other land degradation issues, there are several key criteria now being applied to vegetation in States where clearing is still occurring (Environmental Protection Authority Position Statement No. 2, December 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-clearing extent of the vegetation type; and
- A level of 10% of the original vegetation 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 vegetation community status can be delineated into five (5) classes, where:

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

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

Vegetation extents of pre-European vegetation complexes (Heddle, 1980) within the project area and the remaining percent of vegetation in these complexes within the System 6 region and the Swan Coastal Plain portion of the System 1 region, as recorded by the Environmental Protection Authority (EPA) (EPA, 2006), are shown in **Table 2**.

Although Table 2 shows that the Southern River complex is below the 30% threshold the degraded nature of the vegetation and the fact that it occurs within a road reserve set aside for the interchange connection to Lakes Road East means any road connection alternatives are very limited, if any options are possible at all.

Table 2 Disturbance area vegetation types and condition rating.

Vegetation Type	Detailed Description	Heddle *et al.*, (1980) equivalent	% Remaining (EPA, 2006)	Gibson, *et al.* (1994) equivalent Vegetation Type	Reservation Status	Conservation Status	Vegetation Condition Rating
Remnant Marri and Spearwood over pasture in damplands	Scattered remnant *Corymbia calophylla* (Marri) trees over grazed pasture, with small patches of *Kunzea ericifolia* (Spearwood).	Southern River Complex	19.8	SCP Community 5: Mixed Shrub Damplands	Well reserved	Low risk	5
Melaleuca Dampland	Melaleuca spp. shrubland with *Melaleuca preissiana* (Moonah), *Melaleuca rhaphiophylla* (Swamp Paperbark), *Kunzea ericifolia* (Spearwood) +/- stands of *Baumea* riparia in low-lying basin areas (seasonally inundated / damplands).	Herdsman Complex	34.6	SCP Community 4: *Melaleuca priessiana* damplands	Well reserved	Low risk	5-6

2.4.2 Threatened Ecological Communities

A search of the DEC's TEC database did not identify any TECs or TEC buffers within the New Lakes Road (East) area.

The field biological assessment recorded no Threatened Ecological Communities within the project area and no Threatened Ecological Communities are expected to be impacted by the proposed works (GHD 2006).

2.4.3 Significant Flora

No Declared Rare or Priority Flora species were identified during the field survey.

It should be noted that new populations of the Vulnerable *Drakaea elastica*, have been observed within close proximity (<500 m) to the proposed New Lakes Road (East). This cryptic orchid species prefers habitat that is dominated by *Kunzea glabrescens*, is low-lying and adjoins winter-wet swamps. Flowering for orchid species is restricted during the spring survey season, and may often not occur where the proceeding spring season climatic conditions have been unfavourable (GHD 2006). Although D. elastica has been found in the vicinity it is unlikely that they will be present of impact by the proposed Lakes Road (East) works due to the heavily degraded nature and extent of weed invasion at the site.

2.4.4 Weeds and Declared Plants

The 2006 flora survey recorded many weeds within the project area, the most dominant weed family being Poaceae (grasses) (GHD 2006). Clearing of native vegetation has the potential to introduce and spread weeds.

No Declared Plant species were recorded from this survey of the project area.

2.4.5 Plant Pathogens

The proposed New Lakes Road (East) site is within the appropriate rainfall zone needed to support *Phytophthora cinnamomi* (areas receiving more than 400 mm annual rainfall), it is possible that the pathogen is present within the designated project area and also surrounding areas of bushland.

GHD in conjunction with DEC conducted detailed dieback mapping along the NPBH in 2006. The New Lakes Road east area was largely unmappable due to a lack of susceptible indicator species and cleared land areas. One uninfested area with good condition native vegetation was noted between Fowler and Lakes Roads. Adjoining this, one infested area was identified. The dieback assessment noted New Lakes Road (East) site is considered unprotectable.

2.5 Fauna

2.5.1 Significant Fauna Species

The DEWR maintains a database of matters of national environmental significance that are protected under the *EPBC Act*. An *EPBC Act* Protected Matters Report was generated (from the website of the DEWR), for the matters of significance that may occur in, or may relate to, the survey area. A total of 5 threatened and 5 migratory species were identified as potentially occurring within the survey area.

Table 3 *EPBC Act* Threatened and Listed Marine Species within 2km of the Project area

Species	Classification
Baudin's Black Cockatoo	Vulnerable
Carnaby's Black Cockatoo	Endangered
Chuditch	Vulnerable
Red tailed Phascogale	Endangered
Quokka	Vulnerable
White-bellied Sea Eagle	Migratory
Rainbow Bee-eater	Migratory
Great Egret	Migratory
Cattle Egret	Migratory
Fork-tailed Swift	Migratory

Source: Commonwealth Department of Environment and Water Resources, 2007

It should be noted that some species that appear in the *EPBC Act* Protected Matters Search Tool are often not likely to occur within the specified area, as the search provides an approximate guidance to matters of national significance that require further investigation.

The most likely species to occur within or within the vicinity of the project area are Carnaby's Black Cockatoo and / or Baudin's Black Cockatoo. Target Cockatoo Surveys (Biota, 2006; Biota, 2007) conducted for the NPBH project included the area of the Lakes Road East project. Neither of these surveys identified nesting trees for these protected species within the project area.

2.6 Environmentally Sensitive Areas

The DEC's online Native Vegetation Viewer was searched to determine the location of any Environmentally Sensitive Areas (ESAs) within the vicinity of the project area, as declared by a Notice under Section 51B of the *Environmental Protection Act 1986*.

The search confirmed that there are no Environmentally Sensitive Areas within the New Lakes Road (East) road reserve.

2.7 Reserves Areas

No reserves areas are located within the vicinity of the project area.

2.8 Contaminated Sites

A search of DEC's Contaminated Sites Database indicates no contaminated sites within a 5km radius of the project area.

2.9 Heritage

2.9.1 Non Indigenous Australian Heritage

A search of the DEWR *EPBC Protected Matters Database* did not identify any places listed on the Register of the National Estate within or in close proximity to the project area.

A search of the Western Australian Heritage Council's Heritage Places Database also did not identify any heritage places located within or in close proximity to the project area.

2.9.2 Indigenous Heritage

A search of the Department of Indigenous Affairs Aboriginal Heritage Inquiry System identified that the project area is approximately 130m south of the Serpentine River, which is a registered Aboriginal Heritage site. The details of the site is summarised in Table 4.

Table 4 List of registered Sites within close proximity to the Project Sites

Site ID	Site Name	Site Type	Status
3582	Serpentine River	Ceremonial, Mythalogical	Permanent Register

(Source: Department of Indigenous Affairs, 2007).

Given the distance of the Aboriginal Heritage site from the project area and the limited amount of clearing required, no known aboriginal heritage sites are expected to be impacted by the proposed work.

Aboriginal heritage surveys conducted for the NPBH project (Quartermaine 1996 and O'Connor 2005) did not identify any Aboriginal heritage sites in the vicinity of the project area. Furthermore, on-going consultation with the local indigenous community during the planning and construction of the NPBH have not raised any issues regarding Indigenous heritage site at the in the vicinity of the Lakes Road interchange.

2.10 Visual Amenity, Noise and Dust

Given that properties are situated adjacent to the project area it is perceived that visual amenity, noise and dust control are to require management.

3. Clearing of Native Vegetation

3.1 Assessment Against the Ten Clearing Principles

Clearing is managed by the *Environmental Protection (Clearing of Native Vegetation) Regulations* 2004. However, Main Roads Statewide Project "Clearing Permit" (CPS 818/3) allows clearing in certain circumstances, when the project is not occurring in an Environmentally Sensitive Area (ESA).

Clearing applications are assessed against the Ten Clearing Principles outlined in Schedule 5 of the *Environmental Protection Amendment Act* (2003). These principles aim to ensure that all potential impacts resulting from removal of native vegetation can be assessed in an integrated way.

Based on this desktop PEIA, the proposed project has been assessed against the Ten Clearing Principles and is summarised in Table 5. The project has been assessed to be compliant with the Clearing Principles.

Table 5 Assessment against the Ten Clearing Principles

Principle Number	Principle	Assessment	Outcome
(a)	Native vegetation should not be cleared if it comprises a high level of biological diversity.	The project area is considered to contain a poor level of biodiversity.	Not at variance with clearing principle
(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.	Vegetation within the project area is considered degraded to completely degraded. The area has historically been cleared or modified for residential and farming purposes. Construction of the proposed Lakes Road (East) would have negligible impact on fauna habitat. Impact to fauna will be minimised through implementation of appropriate NPBH environmental management plans.	Not at variance with clearing principle.
(c)	Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.	A flora survey was undertaken within the project area in 2006. No rare or priority flora was observed during the field survey. Populations of the Vulnerable *Drakaea elastica*, have been observed within close proximity (<500 m) to the proposed New Lakes Road (East). It is not expected that these will be impacted by the project.	Not at variance with clearing principle
(d)	Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a threatened ecological community.	The DEC has no records of threatened ecological communities within the project area. No threatened ecological communities were observed during field investigations or previous surveys of the area.	Not at variance with clearing principle
(e)	Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.	Vegetation within the area has predominantly been cleared for rural development and is degraded or completely degraded. It is not considered to be a significant remnant of vegetation.	Not at variance with clearing principle.
(f)	Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.	No vegetation within the project area is associated with wetland or riverine environments.	Not at variance with clearing principle.
(g)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	Clearing within the project area is unlikely to cause appreciable land degradation.	Not at variance with clearing principle. Appropriate management plans may mitigate potential impacts

Principle Number	Principle	Assessment	Outcome
(h)	Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.	No conservation areas are located within or near the project area.	Not at variance with clearing principle.
(i)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water	The clearing of native vegetation has a low potential to cause deterioration in the quality of surface and underground waters.	Not at variance with clearing principle. Appropriate management plans may mitigate potential impacts.
(j)	Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.	The clearing of native remnant vegetation for this project is not considered likely to cause minor, localised, increases in the incidence or intensity of flooding.	Not at variance with clearing principle.

4. Environmental Approvals

4.1 Commonwealth Approvals

No environmental impacts identified during the preparation of this PEIA warrant referral of the project to the Commonwealth under the provisions of the *Environmental Protection and Biodiversity Conservation Act (1999).*

4.2 Government of Western Australia

The EPA is responsible for administering the *Environmental Protection Act (1986).* No environmental impacts were identified in this PEIA which warrant formal of the project for assessment by the EPA.

4.3 Clearing Regulations

The results of this PEIA and assessment of the project against the Ten Clearing principles indicate the clearing required for the development of the Lakes Road east project is not at variance with the principles. Consequently the clearing can be conducted under the provisions of Main Roads Statewide Purpose Clearing Permit (818/3).

5. Conclusions and Recommendations

The results of this PEIA have identified that:

- No environmental impacts identified during the preparation of this PEIA warrant referral of the project to the Commonwealth under the provisions of the *Environmental Protection and Biodiversity Conservation Act (1999)*.
- The EPA is responsible for administering the *Environmental Protection Act (1986)*. No environmental impacts were identified in this PEIA which warrant formal of the project for assessment by the EPA.
- The project has been assessed to be compliant with the Clearing Principles.

6. References

Biota Environmental Sciences (Biota), 2007. *New Perth – Bunbury Highway Black Cockatoo Habitat Tree Survey,* June 2007.

Biota Environmental Sciences (Biota), 2006. *Perth-Bunbury Highway (Kwinana Freeway Extension and Peel Deviation) Targeted Threatened Fauna Survey, prepared for Main Roads Western Australia*, May 2006.

Environmental Protection Authority (EPA) December 2000. *Position Statement No. 2.*

Environmental Protection Agency (EPA), 2006. *Guidance for the Assessment of Environmental Factors (in accordance with the Environmental Protection Act 1986) - Level of Assessment for proposals Affecting Natural Areas Within the System 6 region and Swan Coastal Plain Portion of the System 1 Region.* No.10, June 2006.

GHD, 2006. *Water Corporation Report for DN1400 Water Main from Stirling Trunk Main to North Mandurah Tank Flora and Fauna Assessment.*

Gibson, N., Keighery, B.J., Keighery, G.J., Burbridge, A.H. and Lyons, M.N. (1994). *A Floristic Survey of the Southern Swan Coastal Plain.* Unpublished Report for the Australian Heritage Commission prepared by Department of Conservation and Land Management and the Conservation Council of Western Australia (Inc).

Government of Western Australia, 2000. *Bush Forever Volume 1.* Policies, Principles, Processes. Department of Environmental Protection, Perth, Western Australia.

Heddle, E.M. *et al.* (1980). *Vegetation Complexes of the Darling System, Western Australia.* In: Atlas of Natural Resources, Darling System Western Australia. Department of Conservation and Environment.

O'Connor, R, 2005. *Report on an Ethnographic Survey of the proposed Kwinana Freeway Extension from Safety Bay Road to the Peel Deviation and Associated Projects*, unpublished report prepared for GHD Pty. Ltd, Perth, Western Australia.

Quartermaine Consultants, 1996. *Report on an Aboriginal Site Survey of the Proposed MRWA Peel Deviation Project,* unpublished report prepared for Main Roads Western Australia October 1996.

Western Australia Planning Commission, 2003. *Planning Bulletin 64.*

Figure 1

Locality Plan – Lakes Road (East)

LANDGATE AERIAL PHOTOGRAPHY DATED DEC 2006 SOURCED FROM MRWA - JUN 2007

Figure 2

Aerial Overlay of Lakes Road (East) Project


DEVIATION
EASTERN
ROAD
LAKES

386000

387000

6403000

WOODLANDS PDE

Serpentine River

STOCK RD

FOWLER RD

LAKES RD

LEGEND

- Preferred DN 1400 Route
- New Perth Bunbury Highway Alignment

Stirling Trunk Main

- Rubber Joints
- Welded Joints
- Section Valves

Vegetation Condition

- 1. Pristine or nearly so
- 2. Excellent
- 3. Very good
- 4. Good
- 5. Degraded
- 6. Completely degraded

MAP UNITS PROJECTED IN MGA ZONE 50
NOTE THAT POSITIONAL ERRORS CAN BE > 5M IN SOME AREAS
AERIAL PHOTOGRAPHY DATED DEC 2004 SOURCED FROM DLI - OCT 2005

SCALE

50 0 50 100 150 m

1:5,000 at A3

LOCALITY MAP

Metropolitan Area

CREATED BY	CHECKED	APPROVED
NT		

HORIZONTAL DATUM: GDA 94 PROJECTION: MGA ZONE 50

HEIGHT DATUM: NA METADATA RECORDED:100%

DATE	FILE LOCATION
20.12.06	N:\61\18568\GIS\MXDS\618568-G4.MXD
REVISION	**DRAWING NO**
0	6118568-G4

WATER CORPORATION

GHD CLIENTS|PEOPLE PERFORMANCE

DN 1400 WATER MAIN FROM STIRLING TRUNK MAIN TO NORTH MANDURAH TANK FLORA & FAUNA ASSESSMENT

Figure 9
Vegetation Condition - Map Extent 2

388000

389000

6403000

LAKES RD

388000

389000

LEGEND

- Preferred DN 1400 Route
- New Perth Bunbury Highway Alignment

Stirling Trunk Main

- Rubber Joints
- Welded Joints
- Section Valves

Vegetation Condition

1. Pristine or nearly so
2. Excellent
3. Very good
4. Good
5. Degraded
6. Completely degraded

MAP UNITS PROJECTED IN MGA ZONE 50
NOTE THAT POSITIONAL ERRORS CAN BE > 5M IN SOME AREAS
AERIAL PHOTOGRAPHY DATED DEC 2004 SOURCED FROM DLI - OCT 2005

SCALE

50 0 50 100 150 m

1:5,000 at A3

LOCALITY MAP

Metropolitan Area

CREATED BY	CHECKED	APPROVED
NT		

HORIZONTAL DATUM: GDA 94 PROJECTION: MGA ZONE 50

HEIGHT DATUM: NA METADATA RECORDED:100%

DATE	FILE LOCATION
20.12.06	N:\61\18568\GIS\MXDS\618568-G4.MXD
REVISION	**DRAWING NO**
0	6118568-G4

WATER CORPORATION

GHD CLIENTS|PEOPLE PERFORMANCE

DN 1400 WATER MAIN FROM STIRLING TRUNK MAIN TO NORTH MANDURAH TANK FLORA & FAUNA ASSESSMENT

Figure 10
Vegetation Condition - Map Extent 3

Appendix B

Flora and Fauna

Australian Government
Department of the Environment and Water Resources

Protected Matters Search Tool

You are here: Environment Home > EPBC Act > Search

31 October 2007 12:10

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

You may wish to print this report for reference before moving to other pages or websites.

The Australian Natural Resources Atlas at http://www.environment.gov.au/atlas may provide further environmental information relevant to your selected area. Information about the EPBC Act including significance guidelines, forms and application process details can be found at http://www.environment.gov.au/epbc/assessmentsapprovals/index.html

Search Type: Area

Buffer: 2 km

Coordinates: -32.501403,115.798049, -32.511035,115.798049, -32.511035,115.811154, -32.50140,115.811154

Report Contents:

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Significance: (Ramsar Sites)	3
Commonwealth Marine Areas:	None
Threatened Ecological Communities:	None
Threatened Species:	9
Migratory Species:	7

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate. Information on the new heritage laws can be found at http://www.environment.gov.au/heritage/index.html.

Please note that the current dataset on Commonwealth land is not complete. Further information on Commonwealth land would need to be obtained from relevant sources including Commonwealth agencies, local agencies, and land tenure maps.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at http://www.environment.gov.au/epbc/permits/index.html.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Places on the RNE:	None
Listed Marine Species:	5
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	2
Other Commonwealth Reserves:	None
Regional Forest Agreements:	None

Details

Matters of National Environmental Significance

Wetlands of International Significance [Dataset Information]
(Ramsar Sites)

BECHER POINT WETLANDS	Within same catchment as Ramsar site
FORRESTDALE & THOMSONS LAKES	Within same catchment as Ramsar site
PEEL-YALGORUP SYSTEM	Within 10 km of Ramsar site

Threatened Species [Dataset Information]	Status	Type of Presence
Birds		
Calyptorhynchus baudinii * Baudin's Black-Cockatoo, Long-billed Black-Cockatoo	Vulnerable	Species or species habitat likely to occur within area
Calyptorhynchus latirostris * Carnaby's Black-Cockatoo, Short-billed Black-Cockatoo	Endangered	Species or species habitat likely to occur within area
Mammals		
Dasyurus geoffroii * Chuditch, Western Quoll	Vulnerable	Species or species habitat likely to occur within area
Phascogale calura * Red-tailed Phascogale	Endangered	Species or species habitat may occur within area
Setonix brachyurus * Quokka	Vulnerable	Species or species habitat may occur within area
Plants		
Caladenia huegelii * King Spider-orchid, Grand Spider-orchid, Rusty Spider-orchid	Endangered	Species or species habitat likely to occur within area
Drakaea elastica * Glossy-leaved Hammer-orchid, Praying Virgin	Endangered	Species or species habitat likely to occur within area
Lasiopetalum sp. Serpentine (S.Paust 1103A) WA Herbarium * Wing-fruited Lasiopetalum	Endangered	Species or species habitat likely to occur within area
Lepidosperma rostratum *	Endangered	Species or species habitat likely to

Beaked Lepidosperma		occur within area
Migratory Species [Dataset Information]	Status	Type of Presence
Migratory Terrestrial Species		
Birds		
Haliaeetus leucogaster White-bellied Sea-Eagle	Migratory	Species or species habitat likely to occur within area
Merops ornatus * Rainbow Bee-eater	Migratory	Species or species habitat may occur within area
Migratory Wetland Species		
Birds		
Ardea alba Great Egret, White Egret	Migratory	Species or species habitat may occur within area
Ardea ibis Cattle Egret	Migratory	Species or species habitat may occur within area
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift	Migratory	Species or species habitat may occur within area
Ardea alba Great Egret, White Egret	Migratory	Species or species habitat may occur within area
Ardea ibis Cattle Egret	Migratory	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Dataset Information]	Status	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift	Listed - overfly marine area	Species or species habitat may occur within area
Ardea alba Great Egret, White Egret	Listed - overfly marine area	Species or species habitat may occur within area
Ardea ibis Cattle Egret	Listed - overfly marine area	Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle	Listed	Species or species habitat likely to occur within area
Merops ornatus * Rainbow Bee-eater	Listed - overfly marine area	Species or species habitat may occur within area

Extra Information

State and Territory Reserves [Dataset Information]

Goegrup Lake Nature Reserve, WA

Un-named (No. 44986) Nature Reserve, WA

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the *Environment Protection and Biodiversity Conservation Act 1999*. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under "type of presence". For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the migratory and marine provisions of the Act have been mapped.

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites;
- seals which have only been mapped for breeding sites near the Australian continent.

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgments

This database has been compiled from a range of data sources. The Department acknowledges the following custodians who have contributed valuable data and advice:

- New South Wales National Parks and Wildlife Service
- Department of Sustainability and Environment, Victoria
- Department of Primary Industries, Water and Environment, Tasmania
- Department of Environment and Heritage, South Australia Planning SA
- Parks and Wildlife Commission of the Northern Territory
- Environmental Protection Agency, Queensland
- Birds Australia
- Australian Bird and Bat Banding Scheme
- Australian National Wildlife Collection
- Natural history museums of Australia
- Queensland Herbarium
- National Herbarium of NSW
- Royal Botanic Gardens and National Herbarium of Victoria
- Tasmanian Herbarium
- State Herbarium of South Australia
- Northern Territory Herbarium
- Western Australian Herbarium
- Australian National Herbarium, Atherton and Canberra
- University of New England
- Other groups and individuals

ANUCliM Version 1.8, Centre for Resource and Environmental Studies, Australian National University was used extensively for the production of draft maps of species distribution. Environment Australia is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

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Appendix C

Heritage

Search Criteria

Site 3582

Disclaimer

Aboriginal sites exist that are not recorded on the Register of Aboriginal Sites, and some registered sites may no longer exist. Consultation with Aboriginal communities is on-going to identify additional sites. The AHA protects all Aboriginal sites in Western Australia whether or not they are registered.

Copyright

Legend

Restriction		Access		Status	
N	No restriction	C	Closed	I	Interim register
M	Male access only	O	Open	P	Permanent register
F	Female access	V	Vulnerable	S	Stored data

Coordinate Accuracy

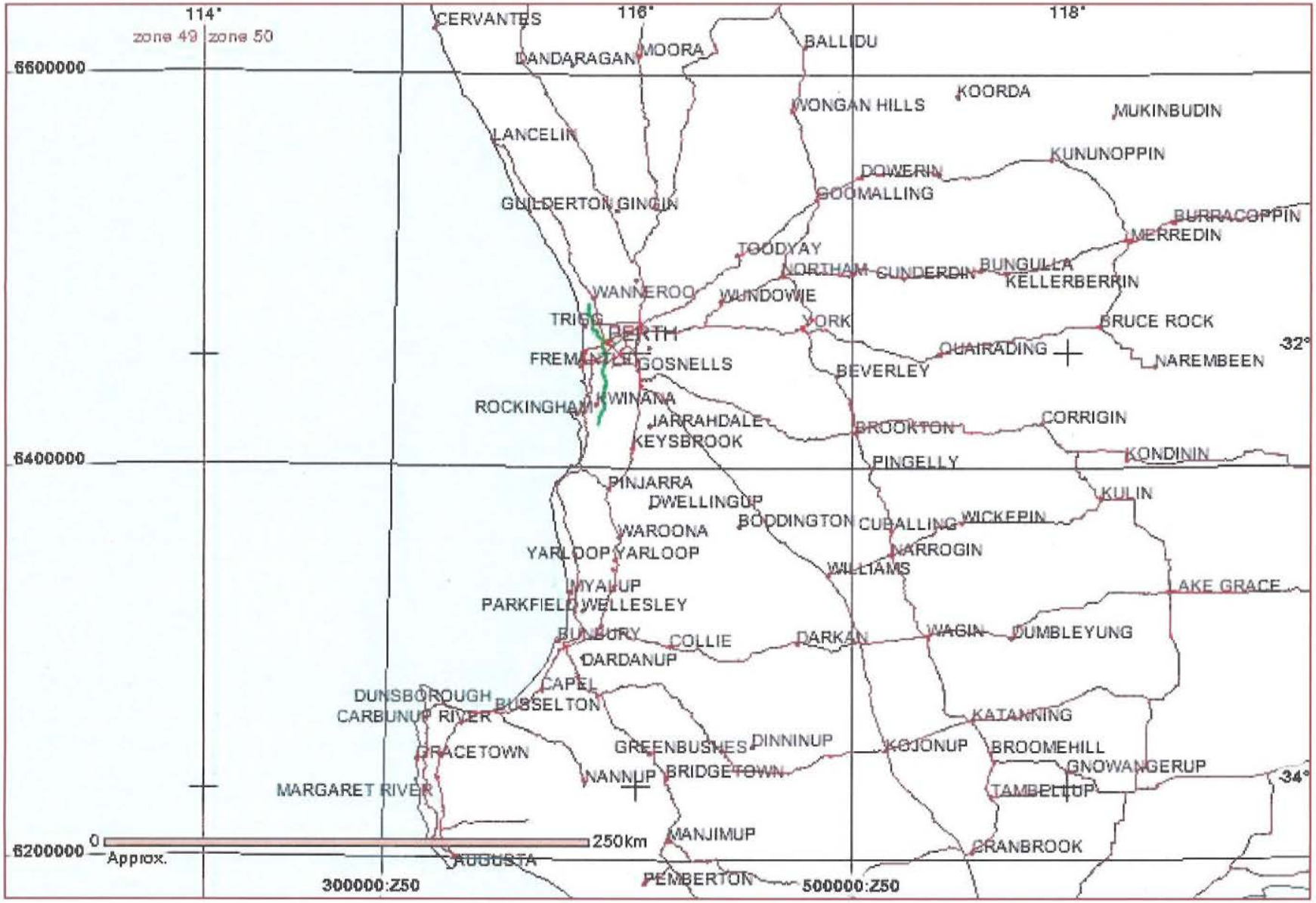
Accuracy is shown as a code in brackets following the site coordinates.

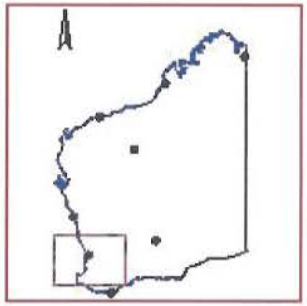
[Reliable]	The spatial information recorded in the site file is deemed to be reliable, due to methods of capture.
[Unreliable]	The spatial information recorded in the site file is deemed to be unreliable due to errors of spatial data capture and/or quality of spatial information reported.

Spatial Accuracy

Index coordinates are indicative locations and may not necessarily represent the centre of sites, especially for sites with an access code "closed" or "vulnerable". Map coordinates (Lat/Long) and (Easting/Northing) are based on the GDA 94 datum. The Easting / Northing map grid can be across one or more zones. The zone is indicated for each Easting on the map, i.e. '5000000:Z50' means Easting=5000000, Zone=50.

Site ID	Status	Access	Restriction	Site Name	Site Type	Additional Info	Informants	Coordinates	Site No.
3582	P	C	N	Serpentine River	Ceremonial, Mythological		*Registered Informant names available from DIA.	Not available for closed sites	S02407





Legend

- Highlighted Area
- Town
- Map Area
- Search Area

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Rev No.	Author	Reviewer		Approved for Issue		
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