PRELIMINARY ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN (MINOR PROJECTS)
Indian Ocean Drive Road Realignment SLK 235.75 TO 240.20

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PRELIMINARY ENVIRONMENTAL IMPACT ASSESSMENT AND ENVIRONMENTAL MANAGEMENT PLAN (MINOR PROJECTS)

INDIAN OCEAN DRIVE ROAD REALIGNMENT SLK 235.75-240.20

1 PROJECT DESCRIPTION

The gap in Indian Ocean Drive from Lancelin to Cervantes has now been completed. This link now provides a continuous road from the North West suburbs of Perth to Brand Highway south of Dongara along the coast. This is a significant change to the network in this area has already stimulated significant changes to traffic volumes.

An improvement strategy for the existing route north of Leeman has been developed with the majority of the works bringing the formation width to 11m with a 9m seal. The first proposed project is from SLK 235.75 to 240.2 will involve the following:

- Reconstruct alignment to improve the alignment of 6 horizontal curves and 4 crest curves; and
- Widening of the formation to a width of 11m with a 9m seal.

This project will be separated into two stages over two financial years. Stage one will be from SLK 235.75 to 237.20 in March 2011, while Stage Two will be from 237.20 to 240.2 and will be October / November 2011.

2 BACKGROUND

This section of road is the first of an improvement strategy for the Indian Ocean Drive (IOD). The improvement strategy focuses on bring up the road to an appropriate standard in line with the newly constructed section.

As per Main Roads' Environmental Assessment and Approval process, the Low Impact Environmental Screening Checklist has been completed for the proposal, refer to Appendix A. As the proposed works require clearing outside of the maintenance zone, the preparation of a project specific Preliminary Environmental Impact Assessment (PEIA) and Environmental Management Plan (EMP) are required. This report fulfils this requirement.

3 DESCRIPTION OF THE PROJECT

The proposed works involve the reconstruction of 4.45km of Indian Ocean Drive to bring the road up to 110km/h standard. The works include:

- Reconstruct alignment to improve the alignment of 6 horizontal curves and 4 crest curves.
- Widening of the formation to a width of 11m with a 9m seal.

The construction will be done under traffic with no sidetracks and will utilise cut/fill method of construction.

The material is likely to be contractor supplied.

3.1 Project Location

The location and boundaries of the study area are shown on Figures 1 & 2.

Figure 1: Location of proposed works

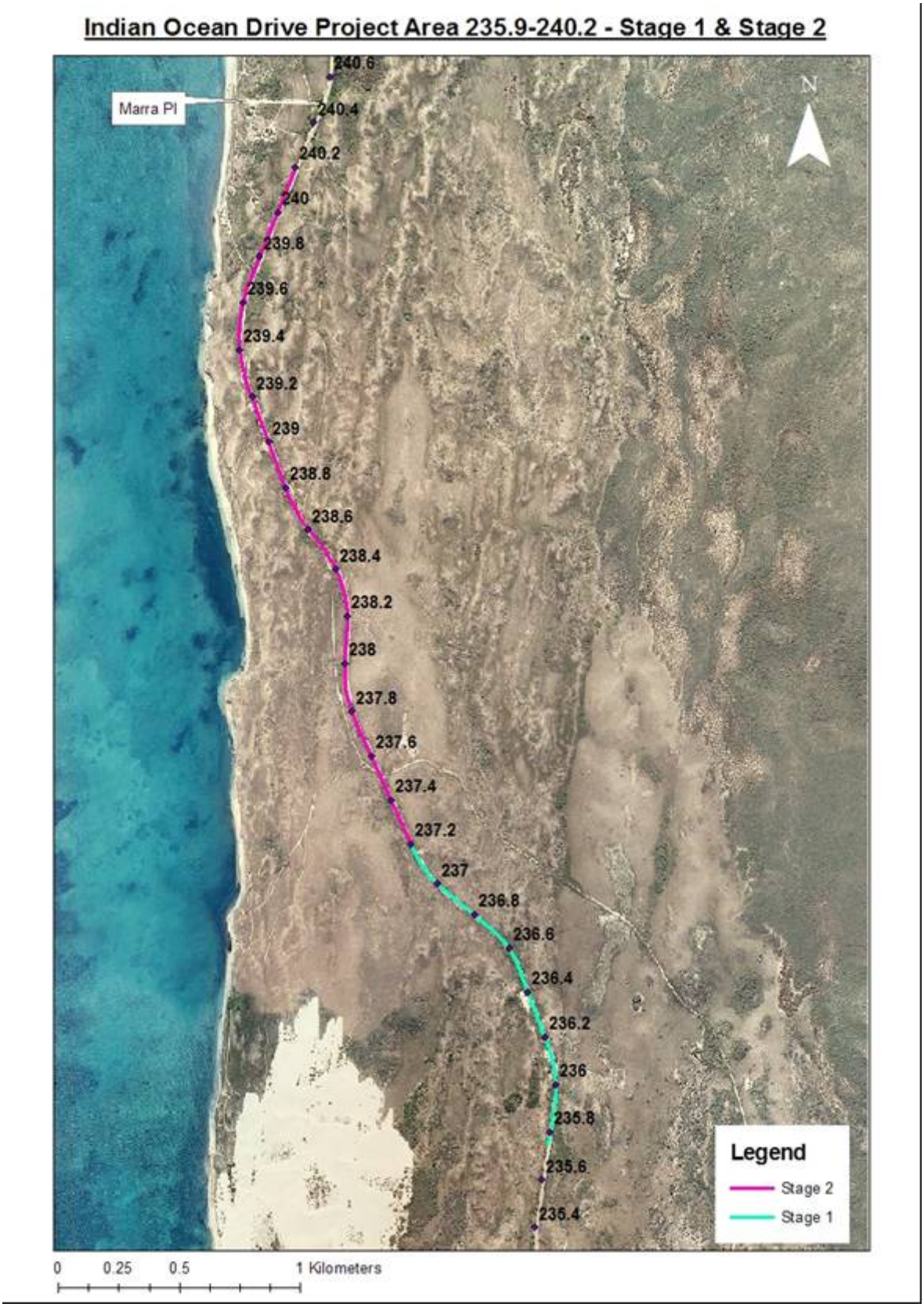


Figure 2: Location of proposed works

4 METHODOLOGY

4.1 Preliminary Desktop Study

A preliminary assessment of the project area and its potential constraints was undertaken by reviewing a number of government agency managed databases (and consulting where necessary).

4.1.1 Wetlands

The Biological Survey undertaken by GHD in 2009 states the following*, "No major rivers or wetlands occur in the vicinity of the Survey area… . The Arrowsmith Lake Area, which is listed on the Register of National Estate, is located approximately 20km north east of the survey area." (page 6)* The report continues to note that "*The area occurs on a coastal dune system with no defined drainage patterns."* (page 25)

4.1.2 Threatened Flora, Fauna and Communities, Conservation Reserves and ESAs

GHD's Biological Survey report used DEC's databases to search for known locations of Threatened Ecological Communities (TEC), Threatened Flora and Threatened Fauna.

4.1.3 Air Quality

The need for a local air quality assessment was determined using the criteria outlined in the MRWA environmental guideline, Air Quality.

4.1.4 Heritage

Non-indigenous heritage was examined utilising the Australian Heritage Places Inventory (http://www.heritage.gov.au), Heritage Council of Western Australia (http://register.heritage.wa.gov.au/) and the Shire of Carnamah's Municipal Heritage Inventory, refer to Appendix C.

4.1.5 Aboriginal Heritage

A Search of the Department of Indigenous Affairs' (DIA's) (http://www.dia.wa.gov.au/Heritage/SitesSurveysSearch.aspx) database was undertaken to determine whether the project area contains any sites of Aboriginal heritage, refer to Appendix D.

4.1.6 Sensitive Water Resources

The Water Information Officer of the Department of Water's regional office was consulted on sensitive water resources (including Public Drinking Water Source Areas) to determine whether the project area supported, or was adjacent to, any significant lakes, rivers or wetlands or proclaimed areas, refer to Appendix E.
http://portal.water.wa.gov.au/portal/page?_pageid=1318,5446647&_dad=portal&_schema=PORTAL

4.1.7 Contaminated Sites

The reserve has been in Main Roads continual control, therefore no further work will be required.

4.1.8 Acid Sulfate Soils

The Western Australian Planning Commission's (WAPC'c) acid sulfate soils maps were reviewed and the self assessment done (http://www.wapc.wa.gov.au/Publications/213.aspx) to determine what level of risk the project area is exposed to, refer to Appendix F.

4.1.9 Weeds

GHD conducted a biological survey within the proposed works area.

4.1.10 Dieback

As the project area receives >400 mm of average annual rainfall, GHD considered the area as maybe susceptible in the desktop assessment of the Biological Survey.

4.2 Commonwealth Referral

The decision whether to refer the project to the Commonwealth's DEH was based upon whether the project would impact upon matters of national significance, e.g. World Heritage properties, protected wetlands and migratory species, Commonwealth marine areas, threatened species or communities or nuclear actions (refer to the Commonwealth webpage www.deh.gov.au/epbc/assessmentsapprovals/index.html for further information and the search tool page at http://www.deh.gov.au/erin/ert/epbc/imap/map.html), refer to GHD's Biological Survey Report 2009.

4.3 Site Investigation

A site visit on Stage 1 was carried out by GHD in September 2009 to examine the general features of the area. While in September 2010 Stage 2 was examined by GHD. The broad vegetation types in the vicinity of the project area were identified. Other issues that were considered included topography, the impacts on creek lines, property access and the potential for noise and vibration impacts (dilapidation).

5 EXISTING ENVIRONMENT

5.1 Description

GHD's Biological Survey Report 2009 notes the following characteristics of the proposed works area:

- Vegetation Type: *Acacia rostellifera, Melaleuca systena* low heath on limestone;
- Vegetation Type: *Acacia lasiocarpa, Melaleuca systena* low heath on limestone*;*
- Vegetation Condition: Ranges from excellent to completely degraded.

5.2 Site Investigation

Site Investigation	Description/Comment
Total area (ha) of native vegetation to be cleared	8ha
Total area (ha) of other vegetation, including regrowth, landscape areas, to be cleared	0
Weeds present	Yes
Drainage areas or wetlands present	No
Adjacent land uses	Reserve 42477 – Shire of Carnamah – Parklands and Recreation Reserve 24496 – Bee Keepers Reserve

6 CLEARING OF NATIVE VEGETATION

Native vegetation describes all indigenous aquatic and terrestrial vegetation (living or dead). The term does not include vegetation that was intentionally sown, planted or propagated unless it was required under a statutory condition.

Apart from activities that are exempt under the clearing regulations, such as clearing vegetation that is less than 10 years old for maintenance, typically all Main Roads clearing will be undertaken using its Statewide Project Purpose Permit.

6.1 Assessment against Clearing Principles

In assessing whether the project is likely to have a significant impact on the environment, the project has been assessed against the DEC's 10 principles of clearing, refer to Appendix K.

The project is likely to be at variance with the DEC's 10 clearing principles.

6.2 Environmentally Sensitive Area (ESA)

Clearing within an Environmentally Sensitive Area (ESA)	Yes/ No	Comments
Does the area to be cleared occur within an ESA where the vegetation is in good or better condition?	N	

7 ASSESSMENT OF ASPECTS AND IMPACTS

Table 1: Aspects and Impacts – Indian Ocean Drive Road Realignment SLK 235.75 – 240.2

Aspect	Evaluation of Potential Impacts
Air quality	Not relevant to the proposed works. Local air quality assessment is not required for the project since: • the predicted traffic flow is less than 15,000 vehicles per day in rural areas; and • residential and other sensitive receptors are not within 200 meters of the road centre.
Dust	Likely to be a minor issue during earthworks. No major sensitive receivers adjacent to the proposed works, but excessive dust could impact vegetation. Activities will need to be subject to dust suppression to control short-term dust generation. Likely to be easily managed by standard construction dust management techniques.
Fauna	No significant fauna issues associated with any of the proposed upgrade works. With the generally exposed nature of the works areas, no significant impacts would be expected on native fauna generally as a result of the proposed works. Recommendations to minimise clearing (see below) will also serve to reduce impacts to fauna and remnant fauna habitat at the sites. No Matters of National Environmental Significance as protected under EPBC Act (1999) will be impacted.
Vegetation – clearing	• 8 ha of native vegetation will be cleared. • The condition of the native vegetation to be cleared ranges from Degraded to Excellent. • The native vegetation will be cleared is well represented regionally. • The native vegetation to be cleared does not occur within an ESA. • The native vegetation to be cleared will be done so using the purpose permit.
Vegetation – TECs/DRF	No TEC's or DRF are within the proposed works areas. However, there have been several locations of priority three and four species located within the proposed project area. Areas outside the project area must not be disturbed as part of the proposed works. Consultation is required with DEC to confirm that significance of the proposed works on the threatened flora. No Matters of National Environmental Significance as protected under EPBC Act (1999) will be impacted.
Vegetation – weeds	Numerous common weed species occur throughout the proposed works areas. These species are likely to be widespread within the reserve and general area. The risk of spreading these weeds species as part of the proposed work should be minimised. Standard weed hygiene measures should be applied for all earthworks in the area, including ensuring that plant and equipment brought on to the site are clean of soil.
Vegetation – dieback	No dieback sensitive flora species are present within the works areas.
Reserves / Conservation areas	There Bee Keepers conservation reserve is adjacent to the project area. Provided clearing of the more intact vegetation is minimised, and that the works do not intrude into intact vegetation areas beyond the project area, there will be minimal impacts to this site.
Heritage (non-indigenous)	A search of the Australian Heritage Places Inventory, Heritage Council of Western Australia and the Shire of Carnamah's Municipal Heritage Inventory on-line databases has indicated that there are no heritage significance listed sites present in the currently proposed works areas. No Matters of National Environmental Significance will be impacted.
Aboriginal heritage	A desktop Aboriginal Heritage Assessment has been conducted by Rory O'Connor in August 2010 on the proposed project area and noted the following: "This report therefore concludes that there is unlikely to be any additional information relating to the aboriginal heritage of that area available and that the works proceed as planned."

Table 1: Aspects and Impacts – Indian Ocean Drive Road Realignment SLK 235.75 – 240.2

Aspect	Evaluation of Potential Impacts
Surface water/drainage	GHD confirmed that the proposed works will not disturb or interrupt any natural drainage and surface run-off patterns.
Wetlands	GHD have advised that there are no wetlands within the vicinity of the project area.
Groundwater	No dewatering nor drainage modifications are required, hence no change to groundwater level or quality.
Noise and vibration	No major sensitive local receivers. Construction works is not be expected to significantly contribute to noise levels at the nearest sensitive receivers, provided works are limited to normal working hours.
Visual amenity	The proposed works will result in minor and short-term visual impacts during construction. Suitable site completion treatments, including landscape planting, could result in an improvement in local visual amenity.
Public safety and risk	Provided traffic management and signage to Main Roads standards is employed, none of the proposed works present any significant hazards to public safety. The proposed works will serve to enhance public safety by improving local road conditions.
Hazardous substances	Not relevant to the proposed works.
Contamination	Given the relatively superficial nature of the required earthworks, there appears to be a low risk of any significant contamination issues. The works is within the road reserve and no known previous land use activities on or adjacent to the project area have had the potential to create contamination, e.g. petrol station.
Salinity	Given the nature and scale of the project the impact is not relevant. There were no visual signs of salinity observed in the project area.
Acid Sulfate Soils	The WAPC's self-assessment (Planning Bulletin 64) indicates that no further soil investigation is required for the project. No further investigations are necessary as there is no dewatering or excavation below the water table is planned.
Statutory Land Use Planning	As the proposed works are entirely within the existing road reserve, no further amendments would be required to the Local Government Planning Scheme or Region Scheme.

8 DECISION TO REFER

Given the scale of the project, the low significance of its impacts to the surrounding environment and the environmental management measures proposed, the project does not require referral to the WA Environmental Protection Authority or the Commonwealth Department of the Environment and Heritage.

9 STAKEHOLDER CONSULTATION

Name	Agency	Date	Comments
Benson Todd	DEC	16/08/2010	

10 ENVIRONMENTAL MANAGEMENT PLAN

This section of the report (the EMP) has been developed for the project area following the completion of the above sections. The main aim of this EMP is to provide a management plan to assist in minimising the environmental impacts of the activities associated with the proposed works and identify who is responsible for the implementation of the management strategies.

This EMP will only address the actions already listed as well as any site-specific issues that were identified during the PEIA. The project specific management measures identified within this EMP are in addition to the standard specifications used for Category 2 projects. The environmental management measures/conditions in Main Road's Specifications 203, 204, 301, 302 and 304 are still to be followed where applicable.

The areas that require special management will be addressed in terms of:

- the timing of the various management actions;
- the topic (e.g. vegetation);
- the objectives for each area;
- the actions that are necessary to minimise the impact;
- the responsible party for implementing the action; and
- whether the action arose from external advice or is a Main Roads requirement.

10.1 Communication Plan

Environmental issues specific to the project will be communicated as follows:

Method	Frequency	Participants	Reference	Record
Project Site				
Induction	Prior to Work	All personnel and subcontractors	EMP and Contractor Environmental Policy	Induction Meeting
Toolbox Meetings	Weekly	Project Personnel	Contractor Safety Plan	Minutes of Meeting
Authority Consultation				
Department of Environment and Conservation	As required	Main Roads' Project Manager and Contractor Project Manager	-	Minutes of meeting

10.1.1 External Communication and Complaints

A complaints register shall be maintained by the contractor. All complaints received shall be forwarded to the Main Roads' Project Manager for action. Serious complaints shall be investigated within 24 hours of the complaint being received.

ENVIRONMENTAL MANAGEMENT PLAN					
Timing	**Topic**	**Objective**	**Action**	**Responsible Party**	**Advice**
All phases of Construction	Vegetation Clearing - Record-keeping	All projects should maintain the required records relating to clearing native vegetation under the purpose permit.	Clearing: • a copy of the PEIA & EMP (Minor projects) for small projects; • a map showing the location where the clearing occurred, recorded in an ESRI Shapefile; • the size of the area cleared (in hectares); and • the dates on which the clearing was done.	Project Manager	DEC
			Revegetation and rehabilitation of areas: • a copy of each Revegetation Plan; • a map showing the location of any area revegetated and rehabilitated recorded in an ESRI Shapefile; • a description of the revegetation and rehabilitation activities undertaken; and • the size of the area revegetated and rehabilitated (in hectares).	Project Manager	DEC
			Each offset implemented: • a copy of each offset proposal; • a map showing the location of any offset implemented recorded in an ESRI Shapefile; • a description of the offset implemented; and • the size of the area of the offset (in hectares).	Project Manager	DEC
Pre-Construction	Vegetation - Clearing	Ensure that the overall objectives of the alignment and construction works are compatible with maintaining and, where possible, enhancing the biological integrity of the surrounding environment and minimising vegetation loss and degradation; and Ensure the retention of as many habitat trees, shrubs and vegetated corridors for fauna as possible, particularly where associated with riparian zones.	Selection of designs/locations that minimise adverse impacts on the biological environment.	Project Manager	Main Roads
			Construction works to be undertaken in summer to reduce the potential for soil erosion and drainage line siltation due to vegetation removal and heavy rains.	Project Manager	Main Roads
			Control/spray weeds species within the project area prior to construction to limit the amount of propagative material that may be spread during disturbance.	Contractor	Main Roads
			Any stockpiled vegetation from clearing works shall not be burnt. This vegetation shall be used during any rehabilitation works and either chipped or replaced according to the EMP.	Contractor	Main Roads
Pre-Construction	Surface Drainage	Maintain the hydrological regime that exists prior to the construction of the proposal.	Stormwater drainage shall be treated and disposed of in accordance with DEC requirements.	Project Manager	DEC
Pre-Construction	Visual Amenity	Ensure that the road blends in with the surrounding environment.	Ensure that the road blends in with the surrounding environment.	Project Manager	Main Roads
Construction	Noise, Vibration and Dust	Ensure that the construction of the proposal does not become a nuisance to the public.	Access to private property and appropriate traffic management measures should be planned and implemented prior to the construction of works.	Contractor	Main Roads

ENVIRONMENTAL MANAGEMENT PLAN					
Timing	**Topic**	**Objective**	**Action**	**Responsible Party**	**Advice**
			Works associated with the construction of the development should not prevent public access along the adjacent reserve. Public access should be maintained along the reserve at all times.	Contractor	Main Roads
			Any complaints regarding dust will be attended to as soon as possible.	Contractor/Project Manager	Main Roads
			Where it is found that trucks leaving the site are carrying excessive material onto sealed surfaces, these areas will be swept to reduce dust generation and maintain traffic safety.	Contractor	Main Roads
			Watering, the use of hydromulch or other forms of mulching to protect loose surfaces shall be used as mitigation measures.	Contractor	Main Roads
Construction	Pollution and Litter	Ensure that the construction of the proposal is managed to a standard that minimises any adverse impacts on the environment.	The designated servicing area will be bunded to contain any spills or leaks and shall not be located in an area adjacent to any drainage areas or watercourses or will drain into a temporary sump.	Contractor	Main Roads
			Emergency cleanup procedures shall be implemented in the case of any spillage. These will include control of spilled material and removal of contaminated soil to an approved site. The contractor shall ensure appropriate equipment is available at all times and shall notify the Superintendent's Representative of a spill.	Contractor	Main Roads
			All waste oil will be collected for recycling and any empty fuel/oil containers, used filters and waste hydraulic parts to be collected and stored in an allocated area then removed to an approved site.	Contractor	Main Roads
			Dumping or temporary storage of bitumen, asphalt, concrete or aggregate should only occur at designated depots or controlled hardstands.	Contractor	Main Roads
			The project areas, including hardstand areas, will be kept in a tidy manner at all times.	Contractor	Main Roads
Construction	Fire	Ensure that the fire risk associated with the construction of the proposal is minimised.	No fires shall be lit within the project area.	Contractor	Main Roads
			Machinery will be fitted with approved spark arresting mufflers.	Contractor	Main Roads
			A water tanker will be on site at all times.	Contractor	Main Roads
Construction	Site Management	Ensure that the site is managed to ensure that construction of the proposal will have minimal impact upon the surrounding environment.	Site office and materials storage areas will be located on previously disturbed/ designated area.	Contractor	Main Roads
Post-Construction	Rehabilitation	Leave the project area free from debris; and Rehabilitate the project area so that the revegetated area provides a net increase in area of native vegetation at the site.	Replace the cleared trees with locally occurring natives.	Contractor	Main Roads
			All waste materials from the development are to be completely removed from the site upon completion of the development. Final clean-up shall be to the satisfaction of the Project Manager and the Site Superintendent.	Contractor	Main Roads

11 MONITORING

After project completion, revegetated areas will be inspected every six months for the first two years to ensure weed spread or establishment has not occurred and to measure the effectiveness of revegetation works.

Monitoring of the weeds identified in the project area will comprise the use of input criteria listed below.

Criterion	Target	After three months	After one year	After three years
Mean weed foliage cover (%).	<20	<20	<20	<20

12 CONTINGENCY MEASURES

Given the scale and nature of the project, no contingency measures are identified as the inherent environmental risks are small.

13 AUDITING

Given the scale and nature of the project, there is no requirement for auditing the implementation of the EMP as the environmental risks are small.

14 REFERENCES

1. GHD Pty Ltd, *Main Roads Western Australia Indian Ocean Drive Biological Survey March 2010.*

Appendix A

Low Impact Environmental Screening Checklist

Form No. 6707/001/01

Checklist - Low Impact Screening Checklist

The Low Impact Screening Checklist is part of the environmental assessment and approval process, refer to in Figure 2 in the Main Roads environmental guideline Environment Assessment and Approvals. It should be noted that the checklist does not address Aboriginal heritage issues. Please refer to Main Roads guideline *Aboriginal Heritage* for the heritage assessment process.

All projects are to be screened to identify those that are Low Impact.

Projects that have "No" to all items are classed as Low Impact and should be implemented using standard contract clauses in the Tender Document Process.
Projects that have "Yes" to any item will require further environmental assessment and will be implemented using an Environmental Management Plan.
Tick "Yes" or "No" for every item.

Project Name Indian Ocean Drive Road Realignment
SLK 236.90 - 238.80

ITEM NO.	ITEM	Y	N
1	New road or road reserve to be created or expansion of existing road reserve.		
2	Works require clearing of native vegetation outside the maintenance zone. Unknown	✓	
3	Works require clearing of native vegetation that is older than 10 years old within the maintenance zone.		✓
4	Works to occur outside normal working hours.		✓
5	Passes over, adjoins or drains directly into a wetland or sensitive watercourse.		✓
6	Local natural drainage regime / hydrology will be changed.		✓
7	Dewatering, or a new water bore required.		✓
8	Known potential source of hazardous materials within or adjoining project area. e.g. Acid Sulphate Soils, existing petrol station, industrial site or waste disposal site (landfill)		✓
9	Buildings will require demolition.		✓

Completed By: Signature [signature] Date 2/8/2010
Name Ben Roberts Title Project Manager

To be reviewed by a Main Roads Environment Officer: Signature [signature] Date 2/8/2010
Name Anna Summerer Title Environment officer

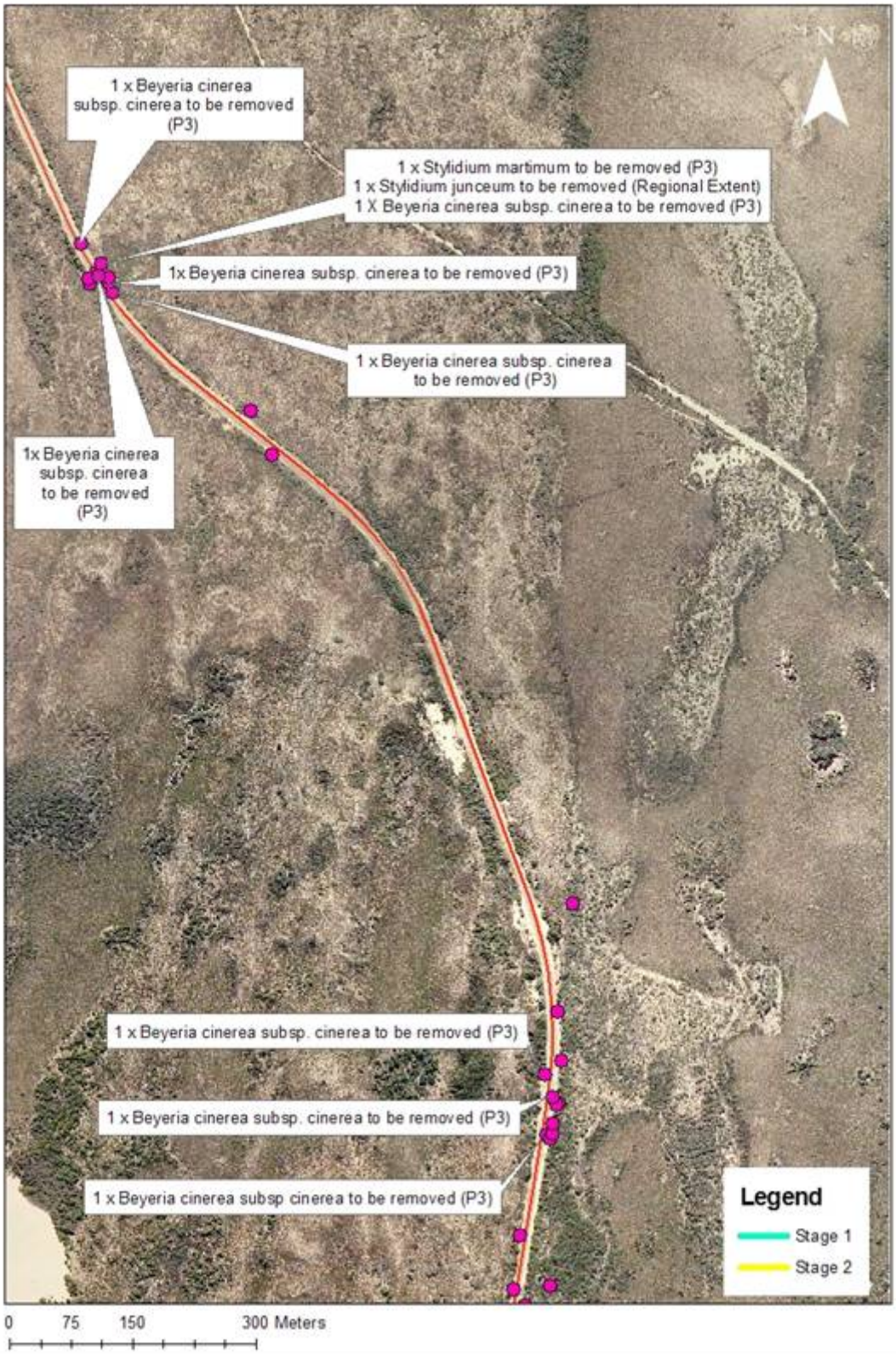
Comments: Need a Ecologist survey required

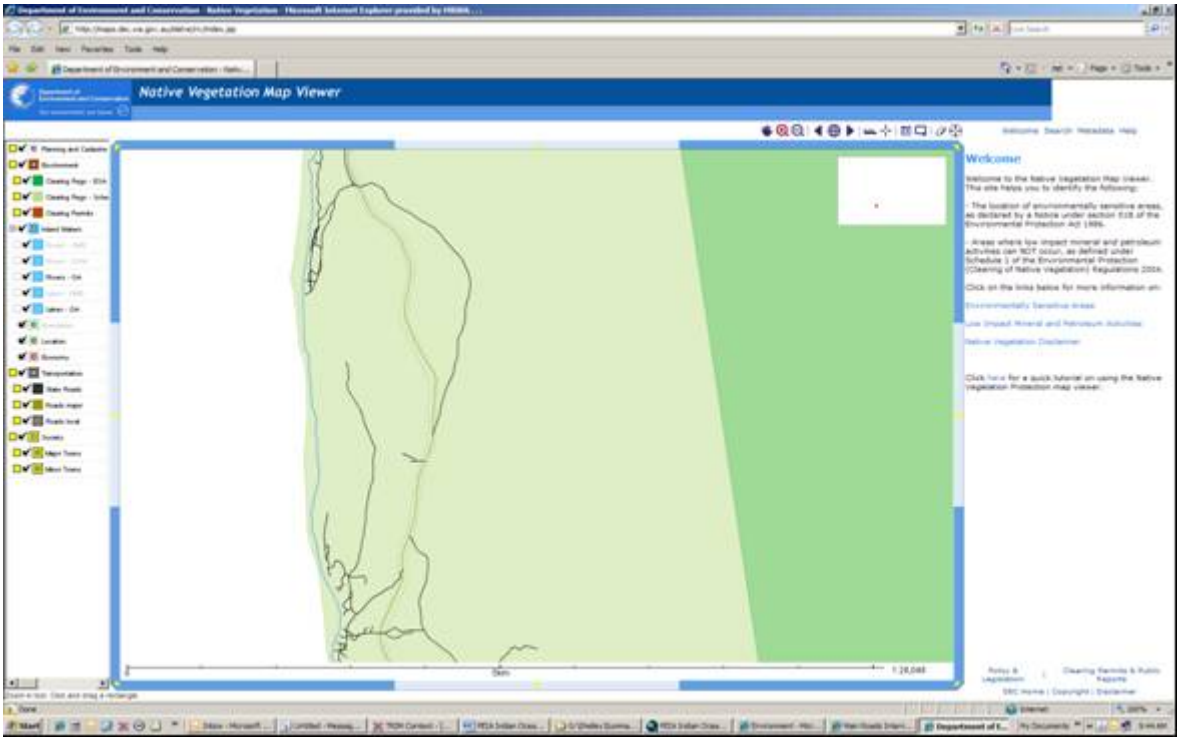
MAIN ROADS Western Australia
Form 6707/001/01 Screening Checklist Rev 3.doc 30/05/07

Appendix B

DEC's Threatened Flora and Fauna Database Searches

Indian Ocean Drive Stage 1 - Priority flora to be removed

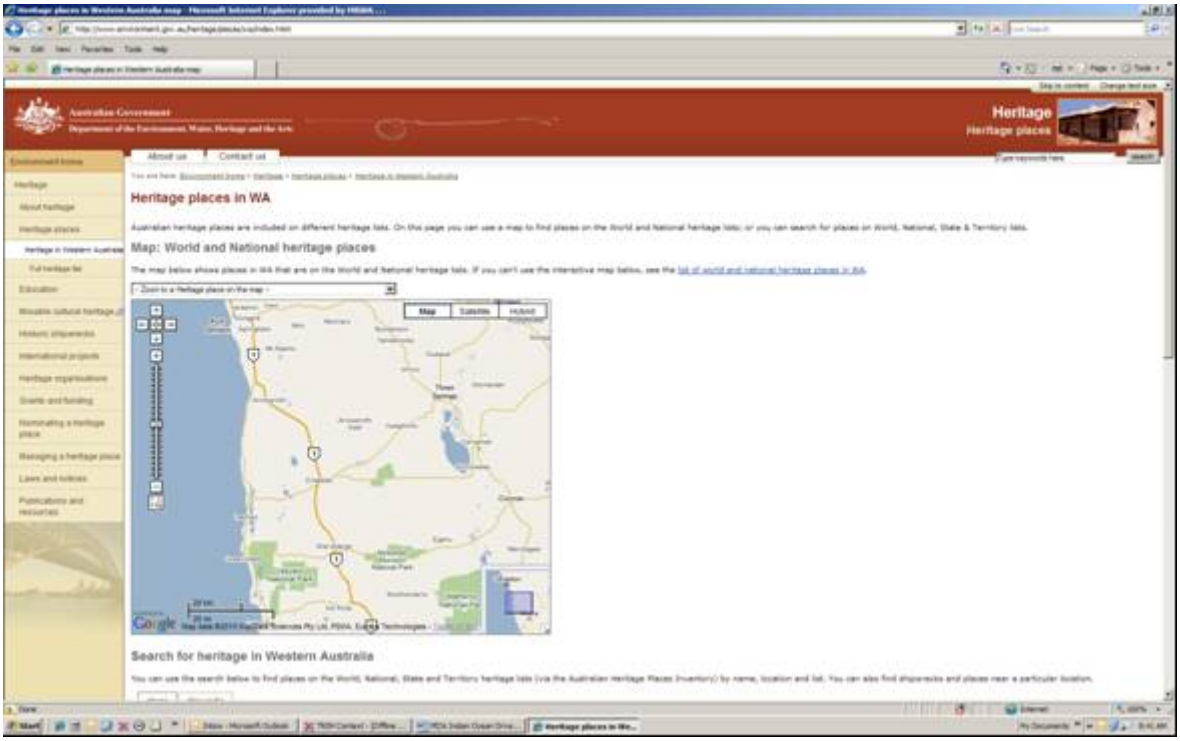




Source: http://maps.dec.wa.gov.au/idelve/nv/index.jsp (17/08/2010 @9.45am)

Appendix C

Australian Heritage Places Inventory, Heritage Council of Western Australia and the Municipal Heritage Inventory Database Searches



Source: http://www.environment.gov.au/heritage/places/wa/index.html (18/08/2010 @ 8.42am)

Alexander Morrison National Park (18591)	Corrow Green Head Road, Eneabba
Anglican Church of Holy Apostles (6146)	Cnr Niven Cr & Lang St, Carnamah
Arro Well (18110)	Reserve 971, track south of Beekeepers Rd, Eneabba
Bakery (fmr) (6138)	MacPherson St, Carnamah
Bankwest Building (453)	Cnr Macpherson & Caron Sts, Carnamah
Berrigan's (6136)	Cnr MacPherson & Niven Sts, Carnamah
Billeroo School (fmr) - Site (6167)	West junction of Rds 13 & 6, Carnamah
Billeroo Spring and Well (6159)	Nr junct of Rds 13 & 6, Carnamah
Blue Metal Quarry (fmr) (6173)	Carnamah
Butcher & Hairdresser Shop (6135)	MacPherson St, Carnamah
CWA Building (6140)	MacPherson St, Carnamah
Carnamah Bowling Club (6153)	Niven Cr, Carnamah
Carnamah District High School (6132)	Cnr MacPherson & King Sts, Carnamah
Carnamah Hotel (6141)	Cnr MacPherson & Robertson Sts, Carnamah
Carnamah Police Station (17434)	Cnr King & McPherson Streets, Carnamah
Carnamah Police Station (fmr) (6134)	Cnr MacPherson & King Sts, Carnamah
Carnamah Post Office & Quarters (fmr) (449)	Macpherson St, Carnamah
Carnamah Post Office & shop (450)	Macpherson St, Carnamah
Carnamah Railway Station, Station Master's House & Siding - Site (6145)	Yarra St, Carnamah
Carnamah Recreation Centre and Showgrounds (6154)	Niven Cr, Carnamah
Carnamah School (fmr) - Site (6157)	Midlands Rd (Hill St), Carnamah
Carnamah Shire Hall (6131)	Cnr MacPherson & Caron Sts, Carnamah
Carnamah Shire Office, Chambers & Library (6130)	MacPherson St, Carnamah
Carnamah War Memorial (6144)	Cnr MacPherson & Yarra Sts, Carnamah
Cooragabbie Well (6160)	On the Old Telegraph Rd, Carnamah
Dallimore's House (6151)	Robertson St, Carnamah
Doctor's House (fmr) (6152)	Robertson St, Carnamah
Eneabba Club Rooms (6178)	Eneabba Dve, Eneabba
Eneabba Horseman's Hall (6177)	Eneabba
Eneabba Police Station (17433)	Eneabba Drive, Eneabba
Eneabba Primary School (6175)	Clark Pl, Eneabba

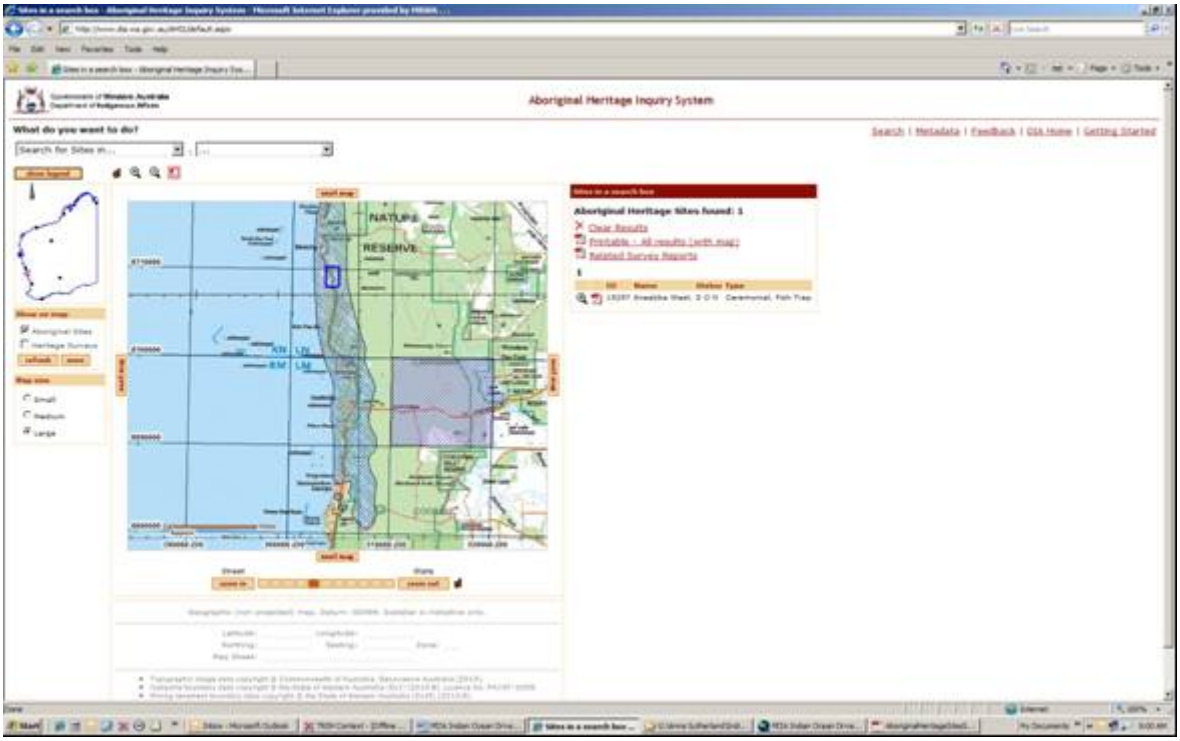
Grenaige (6169)	Midlands Rd, North of Carnamah, Carnamah	
Headmaster's House (fmr) (6148)	Railway Av, Carnamah	
Inering School (fmr) - site (6165)	Carnamah-Perenjori Rd NE of, Carnamah	
King's Homestead (6182)	Eneabba-Coolimba & Gould Simpson Rds, Eneabba	
Lake Erindoon (18108)	Coolimba-Eneabba Road, Warradarge	
Lake Indoon (6181)	S of Eneabba-Coolimba Rd, Eneabba	
Lake Logue (18109)	Eneabba	
Log Causeway (6168)	Yarra Yarra Lakes, Carnamah	
Macpherson Homestead (447)	Carnamah-Bunjil Rd, Carnamah	[REG] [ASSESS]
Manse (15034)	26 Caron Street, Carnamah	
Museum (6142)	Cnr MacPherson & Caron Sts, Carnamah	
Old Geraldton Road - Site (6170)	Old Geraldton Rd, Carnamah	
Original Eneabba School (fmr) (6180)	Eneabba	
Original Eneabba Springs - site (6179)	Eneabba	
Original Eneabba Store (6174)	Cnr King & Gooch Sts, Eneabba	
Orlicz's House (6149)	Yarra St, Carnamah	
Parkers House (6147)	MacPherson St, Carnamah	
Perenjori-Carnamah Road (6171)	Perenjori-Carnamah Rd (thru 5 Gums), Carnamah	
Pinch Gut Well (6161)	Carnamah Perenjori/Reading/Mitchell Rd, Carnamah	
Police House (fmr) (454)	16 Railway Av, Carnamah	
Presbyterian Church (fmr) (451)	Macpherson St, Carnamah	
Pyramid Tea Rooms (fmr) (452)	Cnr Macpherson & Caron Sts, Carnamah	
RSL Memorial Hall (6133)	MacPherson St, Carnamah	
Red Cross Thrift Shop (6139)	MacPherson St, Carnamah	
School Teacher's House (6176)	Dewar St, Eneabba	
Shell Manager's House (fmr) (6150)	Yarra St, Carnamah	
Shop (6137)	MacPherson St, Carnamah	
Squatter Shack 103 (6955)	Dunes - high, Coolimba	
St Andrew's Church (R.C.) (448)	Cnr Caron St & Bowman Rd, Carnamah	
Tathra National Park (18736)	Carnamah Eneabba Road, Eneabba	
WSLC - War Service Depot (6183)	Eneabba-Three Springs & Second North Rds, Eneabba	

Wallaces News and Drapery (6143)	Cnr MacPherson & Yarra Sts, Carnamah
Wheat Silos (6155)	Midlands Rd, Carnamah
Wheat Silos (Original) - Site of (6156)	Yarra St, Carnamah
Winchester Cemetery (6164)	Winchester
Winchester School (fmr) - Site (6163)	Winchester East Rd, Winchester
Winchester Townsite (6162)	Junct Winchester East Rd No 5 & Midlands Rd, Winchester
Wongyarra School (fmr) - Site (6166)	Caron-Bodycoat Rd 13.5 m E of, Carnamah
Yarra Well Cottage - Site (6172)	Carnamah-Eneabba Rd SW of, Carnamah

Source: (http://register.heritage.wa.gov.au/search_results.html?offset=50) (17/08/2010 @ 8.47am)

Appendix D

Department of Indigenous Affairs Database Search

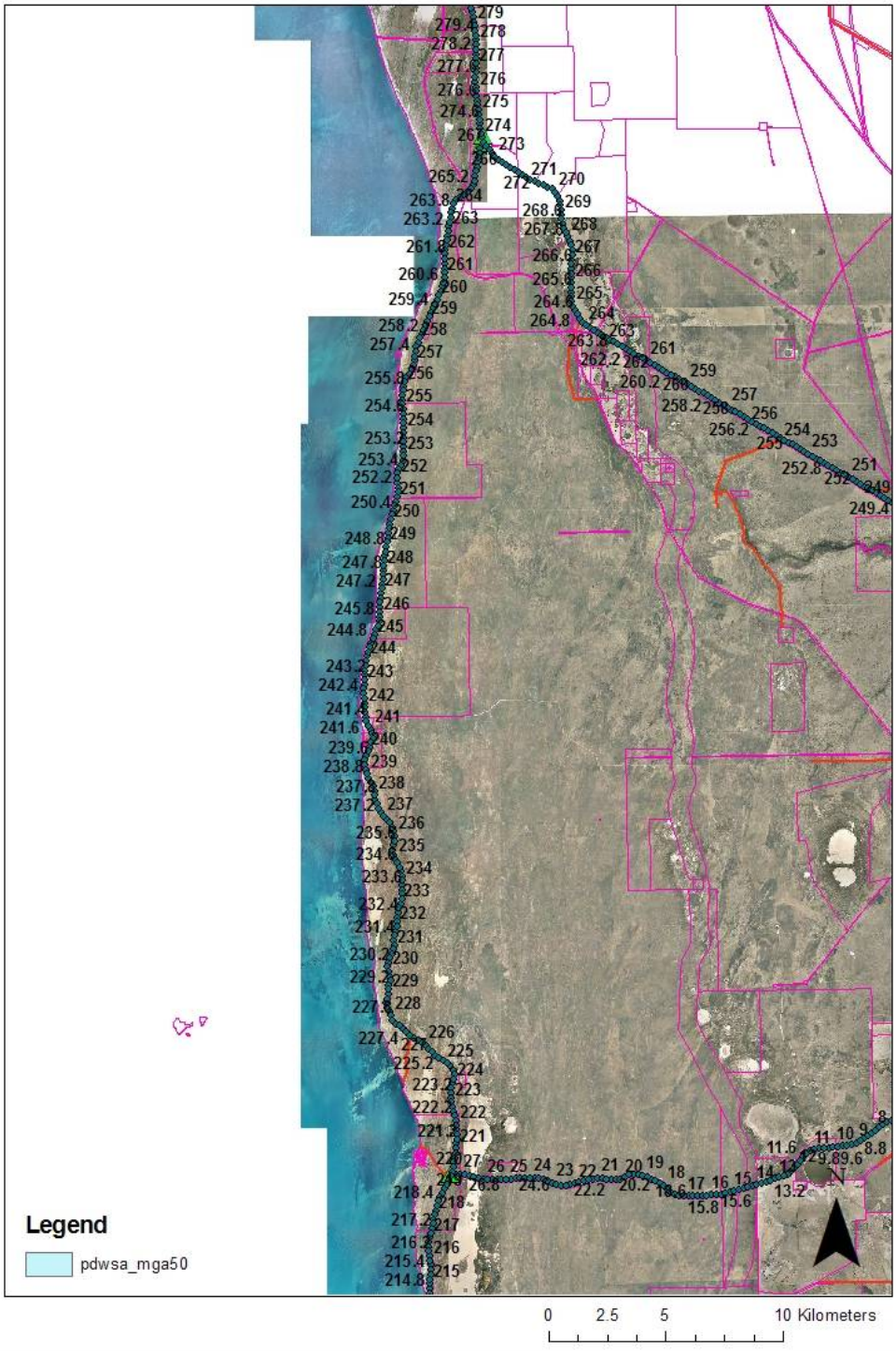


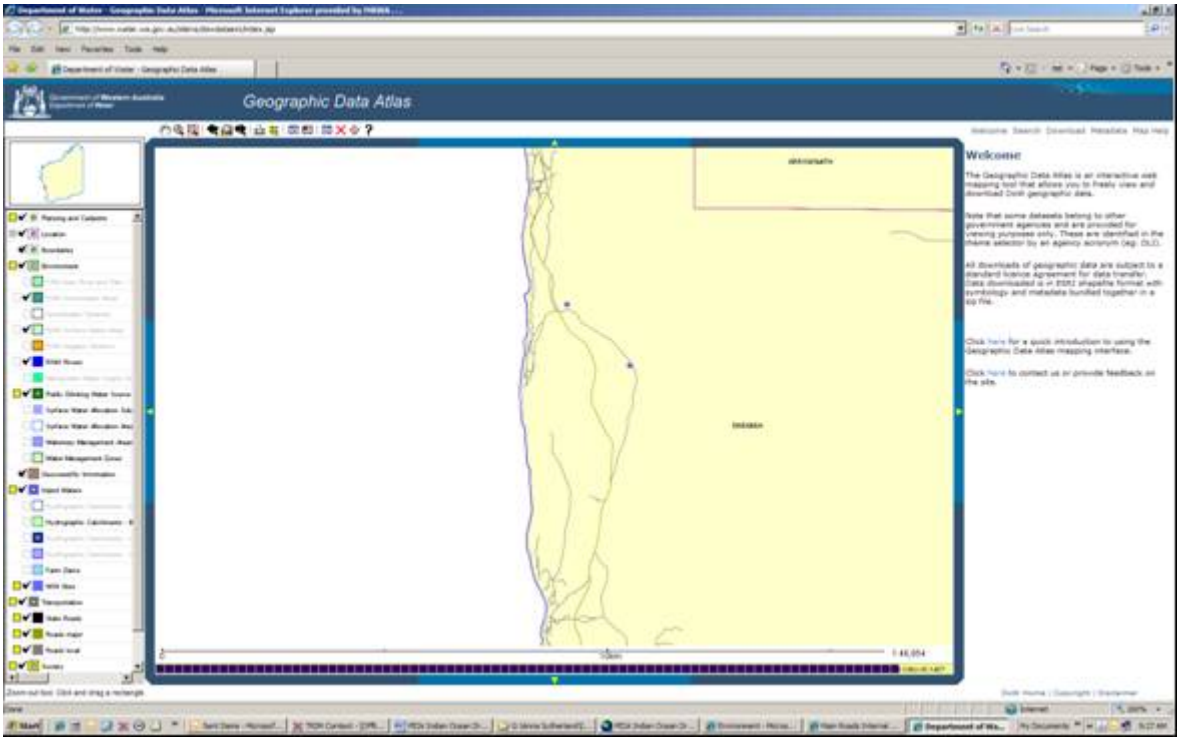
Source: http://www.dia.wa.gov.au/AHIS/default.aspx (17/08/2010 @ 9.01am)

Appendix E

DEC's Sensitive Water Resources Database Search

Indian Ocean Drive - Public Drinking Water Source Area

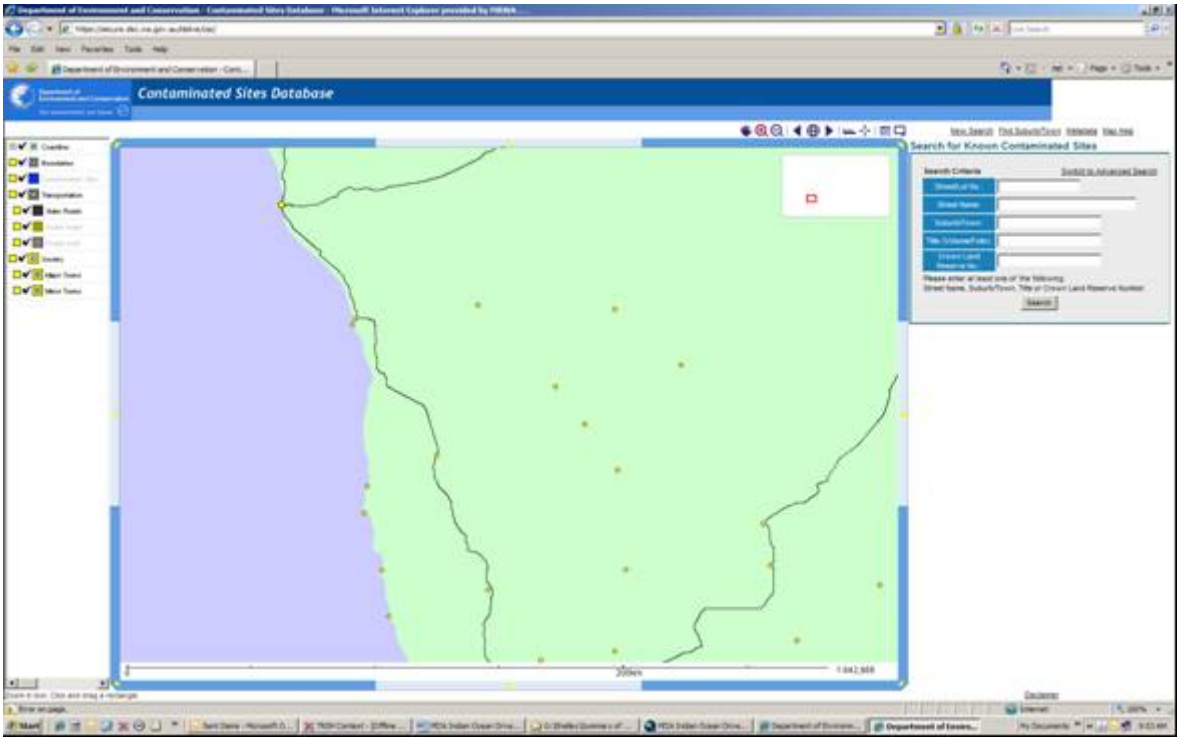




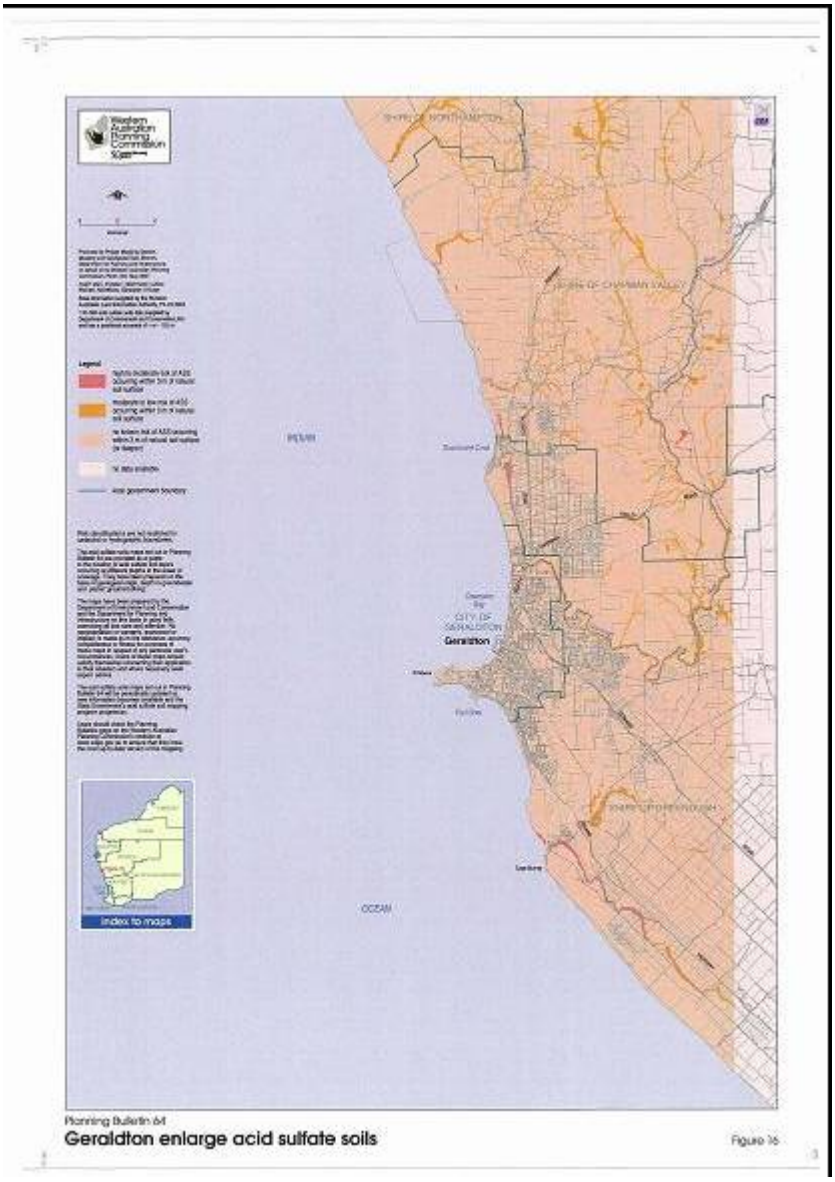
Source: http://www.water.wa.gov.au/idelve/dowdataext/index.jsp (17/08/2010 @ 9.27am)

Appendix F

WAPC's Acid Sulfate Soils Mapping



Source: https://secure.dec.wa.gov.au/idelve/css/ (17/08/2010 @ 9.54am)



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Geraldton enlarge acid sulfate soils

Figure 16

Appendix G

Vegetation Clearing Assessment Report

MRWA Vegetation Clearing Assessment Report

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

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

AREA UNDER ASSESSMENT DETAILS

Proponent details

Proponent's name: **MRWA**

Contacts:

Name:	Anna Sutherland
Phone:	99 56 1207
Fax:	99 56 1240
Email:	anna.sutherland@mainroads.wa.gov.au

Property details

Property: Indian Ocean Drive SLK 235.75 to 240.2

Colloquial name:

Area under assessment

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:	Site Plan Attached
8	0	Mechanical	Road Realignment	☐ Yes

Avoidance/Minimise clearing

How have the clearing impacts been minimised?

BACKGROUND

Existing environment and information

Description of the native vegetation under application

(suggestion: To determine Vegetation Condition use - Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.)

Site Visit Undertaken	☐ Yes	**Fauna / Flora Survey Undertaken**	☐ Yes
Site Report Attached	☐ Yes	**Fauna / Flora Survey Report Attached**	☐ Yes
Site Photos Attached	☐ Yes	**Other Relevant References Attached**	☐ No

Vegetation Complex	Clearing Description	Vegetation Condition	Comment
1026 Mosaic: Shrublands; Acacia rostellifera, Melaleuca cardiophylla thicket / shrublands; Acacia lasiocarpa and Melaleuca acerosa heath.	Mechanical	Degraded to Excellent	

ASSESSMENT OF APPLICATION AGAINST CLEARING PRINCIPLES

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

Comments **Proposal is likely at variance to this Principle**

Methodology GHD Biological survey states that based on findings of the report, the clearing is likely to be at variance with principle a of the DEC's ten clearing principles, due to several locations of priority flora proposed to be removed.

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

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

Methodology GHD Biological Survey

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

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

Methodology GHD Biological Survey

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

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

Methodology GHD Biological Survey

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

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

Methodology GHD Biological Survey

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

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

Methodology GHD Biological Survey

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

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

Methodology GHD Biological Survey

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

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

Methodology GHD Biological Survey. The proposed works are 50m away from Bee Keepers Reserve and will not impact upon the reserve.

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

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

Methodology GHD Biological Survey

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

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

Methodology GHD Biological Survey

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

Comments Not applicable

Methodology

SUBMISSIONS

If required have submissions been requested and addressed

Submission Requested from	Request Sent (Date)	Submission Received (Date)	Issues Raised / Comments Made

ASSESSOR'S RECOMMENDATIONS

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

Recommendation is an Offset Proposal and Environmental Management Plan.

References

OFFICER PREPARING REPORT

_____

Position: Anna Sutherland
Mid West Regional Office
MRWA
Phone: 99 56 1207

Date: 24/11/2010

For each Clearing Principle, please choose a statement from one of the five provided:

CLEARING NOT AT VARIANCE:

– **Proposal is not at variance to this Principle non-biological data where we are sure** e.g. there are NO wetlands or watercourses & where vegetation complexes are clearly well represented, etc.

– **Proposal is not likely to be at variance to this Principle biological data where there is always an element of uncertainty** e.g. surveys have not indicated DRF, TEC, protected fauna, but the surveys may not be fully comprehensive.

INSUFFICIENT INFORMATION TO ASSESS WHETHER CLEARING IS AT VARIANCE

– **Proposal may be at variance to this Principle where there could be an effect but we don't have the tools or information to adequately address the issue** e.g. DRF or priority fauna are known from the local area but not necessarily in the same vegetation type.

CLEARING AT VARIANCE:

– **Proposal is at variance to this Principle where the balance of probability is that there will be an effect** e.g. Consultant advise that there is a high risk and likelihood of land degradation through erosion and eutrophication, or flora surveys identified DRF in the area under application .

– **Proposal is seriously at variance to this Principle where we are sure that there will be a substantial effect. Please consider the scale and cumulative effect of the proposed clearing**.

and then state why

Where we are not 100% sure, we use the PRECAUTIONARY PRINCIPLE in determining potential effects of the clearing.

Directions Associated with Assessor's Recommendations

Revegetation and Rehabilitation

- The permit holder must *revegetate* and *rehabilitate* the following areas once those areas are no longer required for the following purpose for which they were cleared under this Permit:
  - (i) *temporary works*;
  - (ii) *extraction sites*;
  - (iii) *camps*;
  - (iv) *project surveys*;
  - (v) *pre-construction activities*; or
  - (vi) other *project activities* where part or all of the area cleared is no longer required to be used for the purpose for which it was cleared.

  The permit holder need not *revegetate* and *rehabilitate* an area specified above if the permit holder intends to use that cleared area for another *project activity* within 12 months of that area no longer being required for the purpose for which it was originally cleared under the Permit.

  The *revegetation* and *rehabilitation* of an area must be carried out as soon as possible once the permit holder no longer requires that area for a *project activity* and must be undertaken according to a *Revegetation Plan*

- Any area of *native vegetation* that does not form part of the area to be cleared for the *project activity* and that has been damaged as a result of the *clearing* by the permit holder must be *revegetated* and *rehabilitated*.

- The permit holder is not required to *revegetated* and *rehabilitated* if the area is:
  - (ii) less than 0.5 hectares;
  - (iii) not located in an *ESA*; and
  - (iv) an area where the proposed clearing that triggers the obligation to *revegetate* and *rehabilitate* is not at variance with one or more of the *clearing principles*.

Environmental Management Plan

- Where the results of the *EIA* indicate that *clearing* for the *project activity* will have impacts the permit holder must prepare, implement and adhere to an *EMP* to address the *impacts* of the clearing.

New Application Required

- Where the results of the *EIA* indicate that *clearing* for the *project activity* may be seriously at variance with the *clearing principles*, the permit holder must apply to the *CEO* for a *clearing permit* in respect of that *clearing*.

Offset

- The permit holder must determine whether all or part of the *native vegetation* in an area to be cleared is in *good or better condition* and whether part or all of the area to be cleared is:
  (i) a *World Heritage property*;
  (ii) a *Bush Forever site*;
  (iii) a *defined wetland*, or within 50 metres of a *defined wetland*;
  (iv) an area covered by the *Environmental Protection (Gnangara Mound Crown Land) Policy 1992* or the *Environmental Protection (Western Swamp Tortoise) Policy 2002*;
  (v) an area covered by the lakes to which the *Environmental Protection (Swan Coastal Plain Lakes) Policy 1992* applies;
  (vi) a protected wetland as defined in the *Environmental Protection (South West Agricultural Zone Wetlands) Policy 1998*;
  (vii) an area of fringing *native vegetation* in the policy area as defined in the *Environmental Protection (Swan and Canning Rivers) Policy 1998*; or
  (viii) An area that is included on the Register of the National Estate because of its natural heritage value, under the *Australian Heritage Council Act 2003*; and the *clearing* is likely to have an adverse impact on one or more of the natural heritage values for which the area is included on the Register of the National Estate.

  If part or all of the *native vegetation* in an area to be cleared is described in the list above, the permit holder must implement an *offset* with respect to that *native vegetation*.

  Note: Good or better condition means that the vegetation is in either pristine, excellent, very good or good condition according to *Keighery scale*, being the vegetation condition scale described in *Bushland Plant Survey: A Guide to Plant Community Survey for the Community (1994)* as developed by B.J. Keighery and published by the Wildflower Society of WA (Inc). Nedlands, Western Australia.

- If part or all of the *clearing* to be done is or is likely to be at variance with one or more of the *clearing principles*, then the permit holder must implement an offset proposal.

Management Strategy

- If part or all of the clearing to be done is or is likely to be at variance with *clearing principle (g)*, *(i)* or *(j)*, the permit holder must implement a *management strategy.*

Appendix H

Site Photos

Photo 1: SLK 237 Looking South

Photo 2: SLK 237 Looking South

Photo 3: SLK 236.4 Looking South

Photo 4: 236.4 Looking South

Photo 5: 236 Looking South

Photo 6: 236 Looking South

Photo 7: 236 Looking North

Photo 8: 236 Looking North

Photo 9: 235.6 Looking South

Photo 10: 235.6 Looking South

Photo 11: 235.3 Looking South

Photo 12: 235.3 Looking North

Photo 13: 235.07 Looking South

Photo 14: 235.07 Looking South

Photo 15: 235.07 Looking North

Photo 16: 235.07 Looking North

Photo 17: 235 Looking South

Photo 18: 235 Looking South

Photo 19: 235 Looking North

Photo 120: 235 Looking North