ENVIRONMENTAL IMPACT ASSESSMENT

GREAT NORTHERN HIGHWAY UPGRADE
DESIGN PACKAGE 9

Walebing to Bindi Bindi SLK 150.6 to 166.0

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Prepared by	Nigel Rowe
Reviewed by	Troy Collie

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CONTENTS

1 PROJECT LOCATION

The project involves widening and several realignments along the Great Northern Highway between Walebing (150.6 SLK) and Bindi Bindi (166.0 SLK), which is approximately 170km north of Perth (see Figure 1).

2 BACKGROUND

In order to gain an understanding of potential environmental impacts associated with the proposed works Preliminary Environmental Impact Assessments (PEIAs) were undertaken in 2003 by KBR and 2004 by SKM. The PEIAs were undertaken as a desktop exercise and identified the need for additional environmental studies i.e. field surveys, to be undertaken to further define the potential environmental impacts.

Subsequent to the PEIAs, various environmental studies were undertaken focusing on issues such as drainage and salinity, flora, fauna, potential contaminated sites, vegetation clearing analysis and Aboriginal heritage. The findings of the environmental surveys were compiled into summary reports and recommendations were made regarding the requirements for environmental approvals (SKM, 2004; SKM, 2005).

3 DESCRIPTION OF THE PROJECT

The proposed upgrade works will consist of reconstruction and widening of the existing formation, with improvements to vertical and horizontal geometry (realignment) where necessary to achieve acceptable standards for a National Highway. Several realignments are also required to take out two dangerous curves, with the principal objective of the work to improve the level of service and safety for road users along this section of Highway. Extra works associated with the widening and realignment activities will include; construction of ancillary drainage works including side drains, enhancement of off-shoot and table drains and the installation of pavement marking and signs.

3.1 Summary Of Significant Environmental Issues

DP09 the Walebing to Bindi Bindi project will not be referred to the WA Environmental Protection Authority or the Commonwealth Department of the Environment, Water, Heritage and the Arts (DEWHA), however if not managed correctly has two potentially significant environmental issues.

The two issues are:

- Clearing of under represented vegetation and
- Impacts to Carnaby's Black Cockatoo nesting hollows.

The under-represented vegetation is complex 1023 - Medium woodland; York gum, wandoo & salmon gum, 6.4% pre European extent remaining and 1046 - Succulent steppe with woodland; york gum & samphire, 6.1% pre European extent remaining. Both complexes are in poor to fair condition and due to this condition level and the fact that only 450m^2 of complex 1023 and 500m^2 of complex 1046 is to be cleared, this can justifiably be done using Main Roads vegetation clearing Purpose Permit.

With regard to potential impacts on Carnaby's nesting hollows, Ron Johnstone, who is the head of the ornithology department at the WA Museum, installed ten artificial nesting hollows in August 2006 to mitigate the loss of four potential nesting hollows. Separate advice from Dr Johnstone determines the effect and offset will not be a significant impact to Carnaby's Black Cockatoos.

To increase the underrepresented vegetation and provide future habitat and food for Carnaby's Black Cockatoos farmland has been resumed between Walebing and Bindi Bindi, both for road construction and revegetation. At the completion of the project existing road reserve, redundant sections of the old road and resumed farmland will be revegetated, totalling 47.3ha.

4 METHODOLOGY

4.1 Aspects & Constraints

A preliminary assessment of the project area and its potential constraints was undertaken by compiling information from the numerous environmental reports which have been completed for this section of Great Northern Highway (see References).

4.1.1 Wetlands

None present within or near the project area.

4.1.2 Threatened Flora, Fauna and Communities, Reserves and ESAs

Botanical surveys were conducted by Western Botanical during spring 2005 and 2006 with no Threatened Flora, Threatened Ecological Communities (TECs) or Conservation Reserves located that will be impacted by the works. Two Priority Flora species were recorded with a population of 11 *Stenanthemum tridentatum* plants and one *Daviesia debilior* ssp. *sinuans* plant (Priority 3). The *Daviesia debilior* ssp. *sinuans* plant at 152.43 SLK occurs 12.8m to the north of the existing road and will be 35.2m from the road once the new alignment is constructed to the south. Since these surveys were conducted *Stenanthemum tridentatum* has been reclassified and is no longer a priority species.

Threatened fauna was located when Ron Johnstone surveyed the area for Carnaby's Black Cockatoo nesting hollows. Ron found several confirmed and potential nesting hollows along this 15km stretch of road. The road works have since been redesigned several times to minimise the impact, with all confirmed hollows now able to be avoided and only four of the potentials hollows required to be removed.

TABLE 1 – Location of Carnaby's Black Cockatoo Hollows

Approximate Location	Description	Side of Road	Outcome
SLK 151.90 to 152.15	3 suitable hollows	East	All avoided by road realignment
SLK 152.15	1 confirmed nest	West	Avoided, road realigned 36m from tree
SLK 152.95	2 suitable hollows	West	Avoided, road realigned 25m from trees
SLK 153.20 to 153.3	4 suitable hollows	2 on the west and 2 on the east	2 on the west avoided, 2 on the east cleared
SLK 156.15	2 suitable hollows	East	Avoided, however one tree will be close to road
SLK 156.53	7 suitable hollows	6 on the west and 1 on the east	2 on the west cleared, remainder avoided
SLK 157.15 to 157.20	1 confirmed nest and 2 suitable hollows	1 on the west and 2 on the east	Avoided, road realigned 155m from trees
SLK 157.40	1 suitable hollow	East	Avoided, road realigned 163m from tree
SLK 157.55	2 suitable hollows	West	Avoided, road realigned 72m from trees
SLK 157.63 to 157.69	3 suitable hollows	2 on the west and 1 on the east	All avoided by road redesign
SLK 157.75	1 confirmed nests and 1 suitable hollow	East	All avoided by road realignment
SLK 157.85 to 157.95	1 confirmed nest and 2 suitable hollows	2 on the west and 1 on the east	All avoided by road realignment
SLK 158.00	1 suitable hollow	West	Avoided, road realigned 195m from tree
SLK 158.20	1 suitable hollow	East	Avoided, road realigned 120m from tree
SLK 158.55	1 confirmed nest	East	Avoided, road realigned 66m from tree
SLK 158.80	1 suitable hollow	West	Avoided, road realigned 25m from tree
SLK 158.95	1 confirmed nest and 1 suitable hollow	1 on the west and 1 on the east	All avoided by road redesign

4.1.3 Air Quality

The need for a local air quality assessment was determined not necessary using the criteria outlined in the MRWA environmental guideline, Air Quality.

4.1.4 Heritage

No sites present within or near the project area.

4.1.5 Aboriginal Heritage

Aboriginal heritage field surveys were undertaken towards the end of 2004 along Great Northern Highway. The Ethnographic Survey did not locate any sites of cultural significance within the project area, however the Aboriginal people who participated in the survey raised the concern that there might be the potential for a burial site near the existing road near Walebing (O'Connor 2005c). Former camps for Aboriginal itinerant farm workers were located on the western side of the Great Northern Highway in the reserve on the western side of Miling-Bogart Railway. These are outside of the road reserve and therefore not within the project area (O'Connor 2005c).

No other areas of Aboriginal significance were recorded (O'Connor 2003, Quartermaine 2003).

4.1.6 Sensitive Water Resources

None present within or near the project area.

4.1.7 Contaminated Sites

The work is within the road reserve and resumed farmland, which has not been used for any activity that may have caused contamination.

4.1.8 Acid Sulfate Soils

No further investigations are necessary as there is no dewatering or excavation below the water table.

4.1.9 Weeds

Numerous common weed species occur throughout the proposed works areas however no declared plants are present in the project area.

4.1.10 Dieback

The project area falls within the annual 400-600mm rainfall zone in which dieback may occur (Walebing 460mm) as such the area should be managed for dieback.

5 EXISTING ENVIRONMENT

5.1 Description

Vegetation was mapped as vegetation association 7 (Medium woodland: York Gum and Wandoo) between SLK 150.80 and 157.00. Northwards of SLK 157.00, vegetation association 142 (Medium woodland: York Gum and Salmon Gum) has been identified (*Shepherd et al 2002*). 10% of vegetation association 7 remains compared to its original pre-European extent and 24.8% of vegetation association 142 remains compared to its original extent. On a local scale, field surveys identified 13 vegetation associations within three broad habitats (Eucalyptus woodland, Casuarina forest and woodland and other Shrubland).

The 13 vegetation types located within the works identified by the botanist are;

05 – Medium woodland; wandoo & powderbark (Eucalyptus accedens), 44.7% pre European extent remaining which is 23,105.851ha from an original extent of 51,732.384ha.
07 – Medium woodland; York gum (Eucalyptus loxophleba) & wandoo, 12.7% pre European extent remaining which is 22,903.574ha from an original extent of 179,731.728ha.
35 – Shrublands; jam scrub with scattered York gum, 10.5% pre European extent remaining which is 19,453.716ha from an original extent of 184,513.443ha.
48 – Shrublands; scrub-heath, 28.5% pre European extent remaining which is 8,775.904ha from an original extent of 30,815.161ha.
142 - Medium woodland; York gum & salmon gum, 26.5% pre European extent remaining which is 188,532.759ha from an original extent of 711,281.189ha.
352 - Medium woodland; York gum, 16.6% pre European extent remaining which is 119,957.636ha from an original extent of 724,296.44ha.
936 - Medium woodland; salmon gum, 96.7% pre European extent remaining which is 675,658.478ha from an original extent of 698,753.822ha.
946 - Medium woodland; wandoo, 21.3% pre European extent remaining which is 11,321.462ha from an original extent of 53,226.849ha.
950 - Medium woodland; Casuarina obesa, 38.3% pre European extent remaining which is 190.102ha from an original extent of 496.933ha.
676 - Succulent steppe; samphire, 30.2% pre European extent remaining which is 702.115ha from an original extent of 2,321.833ha.
1023 - Medium woodland; York gum, wandoo & salmon gum (Eucalyptus salmonophloia), 6.4% pre European extent remaining which is 103,064.167ha from an original extent of 1,601,636.855ha.
1040 - Medium woodland; York gum & Casuarina obesa, 19.9% pre European extent remaining which is 554.06ha from an original extent of 12,777.347ha.
1046 - Succulent steppe with woodland; york gum & samphire, 6.1% pre European extent remaining which is 52.955ha from an original extent of 861.817ha.

These vegetation complexes have been recorded by SLK and GPS coordinates for the works along with the condition of the vegetation, see Table 1 on the following page.

5.2 Site Investigation

A site visit to examine the area was carried out by Project Managers Paul Kerle and David Clarkson and Environment Officers Dinky Goble-Garratt and Nigel Rowe on 14/11/2006.

Site Investigation	**Description/Comment**
Total area (ha) of native vegetation to be cleared	4.8ha
Total area (ha) of other vegetation (e.g. regrowth, landscape areas), to be cleared	0.0ha
Weeds present	Yes (no declared weeds)
Drainage areas or wetlands present	No wetlands present, minor drainage lines do cross the road through culverts
Adjacent land uses	Farmland

TABLE 2 – Vegetation Type and Condition (Easting & Northing in WGS 84 - UTM/UPS 50J)

SLK	Easting	Northing	Side of Existing GNH	Vegetation Type	Vegetation Condition	% Pre European Remaining	Clearing (m^2)
150.60	425203	6604988	R	946	good	21.3	0
150.65	425284	6604991	R	352	fair	16.6	200
150.70	425285	6604978	L	946	fair	21.3	550
150.90	425564	6604980	L	35	fair	10.5	550
151.00	425642	6604991	R	48	fair	28.5	200
151.10	425756	6605014	L	352	fair	16.6	500
151.20	425778	6605031	R	35	fair	10.5	400
151.30	425906	6605084	R	352	fair	16.6	150
151.35	425984	6605119	R	7	fair	12.7	100
151.40	426025	6605129	R	7	fair	12.7	200
151.50	426040	6605141	R	352	fair	16.6	400
151.60	426209	6605205	R	352	fair	16.6	400
151.70	426273	6605244	R	7	fair	12.7	850
151.70	426293	6605242	L	7	fair	12.7	800
151.90	426452	6605310	L	0	no condition		0
152.10	426652	6605435	R	946	good	21.3	1200
152.30	426731	6605509	L	7	fair	12.7	1650
152.40	426892	6605615	L	946	good	21.3	2000
152.50	426882	6605637	L	48	good	28.5	2250
152.60	426964	6605682	R	946	good	21.3	200
152.70	427183	6605790	L	946	fair	21.3	200
152.80	427275	6605840	L	0	poor		100
152.90	427306	6605867	R	1023	fair	6.4	0
153.00	427366	6605889	L	946	fair	21.3	100
153.05	427423	6605929	R	7	fair	12.7	0
153.10	427497	6605958	L	142	fair	26.5	900
153.15	427514	6605977	R	352	good	16.6	0
153.25	427615	6606030	L	5	good	44.7	150
153.30	427649	6606041	L	352	fair	16.6	150
153.35	427705	6606079	L	0	poor		0
153.40	427720	6606079	L	35	fair	10.5	0
153.40	427738	6606098	R	5	fair	44.7	150
153.45	427765	6606103	L	946	fair	21.3	0
153.50	427833	6606151	R	352	fair	16.6	400
153.75	428047	6606255	L	352	fair	16.6	450
153.90	428170	6606320	L	35	fair	10.5	100
154.00	428265	6606378	L	35	fair	10.5	400
154.15	428387	6606448	R	352	fair	16.6	200
154.30	428558	6606532	L	352	fair	16.6	500
154.40	428597	6606562	R	5	fair	44.7	150
154.45	428680	6606604	R	946	good	21.3	400
154.50	428718	6606619	L	35	fair	10.5	0
154.55	428724	6606627	L	352	good	16.6	0
154.60	428767	6606642	L	0	poor		350
154.65	428826	6606671	L	7	fair	12.7	100
154.70	428888	6606706	L	0	poor		250
154.75	428927	6606727	L	352	fair	16.6	0
154.80	428949	6606740	L	1040	fair	19.9	0
154.85	429006	6606771	L	0	poor		0
154.85	429032	6606794	R	352	fair	16.6	150
154.90	429037	6606789	L	35	fair	10.5	300
155.60	429739	6607164	L	352	fair	16.6	2000
155.70	429816	6607206	L	35	fair	10.5	500
155.90	430008	6607315	R	1046	fair	6.1	350
156.00	430080	6607358	R	352	fair	16.6	200

156.05	430087	6607348	L	352	fair	16.6	400
156.10	430138	6607375	L	35	fair	10.5	50
156.15	430130	6607438	R	950	fair	38.3	400
156.20	430170	6607458	R	352	fair	16.6	250
156.30	430257	6607447	L	352	fair	16.6	400
156.40	430412	6607548	R	0	poor		50
156.50	430507	6607620	R	142	fair	26.5	1600
156.70	430590	6607658	R	352	fair	16.6	700
156.90	430809	6607748	R	1046	fair	6.1	0
156.90	430825	6607739	L	352	fair	16.6	0
157.20	431088	6607851	R	936	fair	96.7	0
157.25	431143	6607878	R	352	fair	16.6	0
157.30	431181	6607892	L	142	fair	26.5	0
157.60	431323	6608151	L	352	fair	16.6	0
157.70	431358	6608255	L	142	fair	26.5	550
157.80	431394	6608399	R	142	fair	26.5	0
157.90	431411	6608428	L	936	fair	96.7	0
157.95	431434	6608506	R	352	fair	16.6	0
158.00	431490	6608583	R	1046	fair	6.1	0
158.10	431522	6608617	R	352	fair	16.6	50
158.80	432252	6608811	R	352	fair	16.6	300
159.10	432539	6608855	L	35	fair	10.5	800
159.30	432711	6608896	R	35	fair	10.5	600
159.40	432856	6608922	R	352	fair	16.6	250
159.50	433004	6608948	R	1023	fair	6.4	200
159.60	433022	6608940	L	352	fair	16.6	100
159.70	433029	6608943	L	142	fair	26.5	250
159.80	433222	6608987	R	35	fair	10.5	200
159.90	433291	6608999	R	352	fair	16.6	300
160.10	433449	6609017	R	936	fair	96.7	350
160.20	433586	6609020	R	35	fair	10.5	600
160.50	433897	6609027	R	352	fair	16.6	900
160.80	434217	6609025	L	352	fair	16.6	1400
160.90	434281	6609036	R	950	fair	38.3	1100
160.95	434317	6609027	L	0	poor		100
161.00	434361	6609030	L	950	fair	38.3	2000
161.00	434397	6609040	R	352	fair	16.6	600
161.90	435136	6609329	L	352	fair	16.6	2100
162.00	435234	6609390	L	35	fair	10.5	150
162.10	435298	6609439	R	142	fair	26.5	350
162.30	435469	6609536	L	352	fair	16.6	50
162.40	435576	6609604	L	142	fair	26.5	50
162.50	435635	6609645	L	35	fair	10.5	0
162.70	435822	6609763	L	0	poor		100
162.80	435857	6609793	R	35	fair	10.5	250
163.00	436052	6609953	R	142	fair	26.5	800
163.10	436099	6609990	L	352	fair	16.6	400
163.20	436186	6610101	R	0	poor		900
163.60	436462	6610374	L	142	fair	26.5	150
163.70	436540	6610457	L	352	fair	16.6	200
163.80	436620	6610543	L	0	poor		750
164.00	436722	6610665	R	1046	fair	6.1	150
164.10	436767	6610718	R	352	fair	16.6	200
164.20	436819	6610756	L	676	fair	94.9	200
164.30	436920	6610867	L	352	fair	16.6	400
164.40	436925	6610885	R	1023	fair	6.4	250
164.50	437010	6610975	R	352	fair	16.6	250
164.70	437222	6611159	R	142	fair	26.5	400
164.90	437375	6611201	L	142	fair	26.5	500
164.95	437398	6611211	L	936	fair	96.7	100

164.95	437412	6611229	R	936	fair	96.7	300
165.00	437419	6611221	L	352	fair	16.6	0
165.00	437432	6611244	R	352	fair	16.6	500
165.10	437509	6611253	L	352	fair	16.6	100
165.10	437556	6611275	R	352	fair	16.6	200
165.20	437620	6611276	L	352	poor	16.6	50
165.25	437644	6611287	L	950	poor	38.3	500
165.30	437662	6611280	L	352	poor	16.6	50
165.30	437671	6611296	R	950	fair	38.3	0
165.40	437803	6611294	R	352	fair	16.6	0
165.45	437843	6611280	L	0	no condition		0
165.45	437856	6611292	R	35	fair	10.5	0
165.50	437885	6611284	L	352	poor	16.6	300
165.55	437970	6611295	R	352	fair	16.6	0
165.60	437999	6611286	L	0	no condition		0
165.65	438062	6611309	L	352	fair	16.6	400
165.70	438104	6611334	R	352	fair	16.6	50
165.70	438115	6611323	L	352	fair	16.6	600
165.90	438325	6611407	R	352	fair	16.6	450
166.00	438353	6611406	L	352	fair	16.6	100
166.00	438356	6611419	R	35	fair	10.5	50
166.05	438432	6611435	L	352	fair	16.6	0
166.10	438459	6611456	R	0	no condition		0
166.15	438496	6611460	L	0	no condition		0
166.15	438509	6611474	R	35	fair	10.5	0
166.20	438545	6611494	R	35	fair	10.5	0
166.20	438581	6611491	L	35	fair	10.5	0
166.25	438583	6611490	L	35	fair	10.5	0
166.30	438626	6611500	L	35	fair	10.5	0
166.35	438678	6611522	L	35	fair	10.5	0
166.35	438676	6611538	R	352	fair	16.6	0
166.40	438728	6611556	R	0	no condition		0
166.40	438743	6611545	L	0	no condition		0
166.45	438770	6611571	R	352	fair	16.6	0
166.45	438810	6611565	L	35	fair	10.5	0
166.50	438815	6611588	R	936	fair	96.7	0
166.50	438837	6611572	L	0	no condition		0
166.55	438855	6611577	L	352	poor	16.6	0
166.55	438866	6611600	R	35	fair	10.5	0
166.60	438892	6611616	R	0	no condition		0
166.60	438899	6611598	L	35	poor	10.5	0
166.65	438955	6611620	L	35	fair	10.5	0
166.65	438957	6611636	R	936	fair	96.7	0
166.70	438986	6611642	R	0	no condition		0
166.75	439040	6611654	R	35	fair	10.5	0
166.75	439064	6611642	L	35	fair	10.5	0
166.80	439080	6611647	L	0	no condition		0
166.80	439092	6611654	R	35	fair	10.5	0

6 CLEARING OF NATIVE VEGETATION

This project will clear 4.8ha of native vegetation over the 15.4km length which is primarily thin strips of degraded overstorey vegetation which remain on the roadside. The clearing breakdown by vegetation complex is summarised below;

TABLE 3 – Vegetation Type and Clearing Figures

Vegetation Type	Clearing (m^2)
0 (unable to determine)	2600
5	450
7	3700
35	4950
48	2450
142	5550
352	17750
676	200
936	750
946	4650
950	4000
1023	450
1040	0
1046	500
Total =	**48000**

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 A.

The project may possibly have been at variance with principle two, this variance has however been mitigated through the installation of ten nesting hollows. The project is therefore deemed to be *not at* variance with the 10 clearing principles and able to be delivered using Main Roads' clearing permit.

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?	**No**	No ESA's and no vegetation classified as being in good or better condition

7 DECISION TO REFER

The decision whether to refer the project to the Commonwealth's DEWR was based upon whether the project would impact upon matters of national significance. The works do impact on four potential Carnaby's Black Cockatoo hollows, with Carnaby's listed as a threatened species under the EPBC Act. This impact is however categorised by the world leading Carnaby's Black Cockatoo expert, Ron Johnstone, as 'not significant' and the loss mitigated through Main Roads installing ten artificial nesting hollows in the area in August 2006. The proposed action does not have a significant impact on Carnaby's Black Cockatoo's and therefore will not be referred to the DEWR.

Given the scale of the project 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 Water Resources.

8 ASSESSMENT OF ASPECTS AND IMPACTS

Table 3: Aspects and Impacts – *Walebing to Bindi Bindi Upgrade 150.6 – 166.0 SLK*

Aspect	Evaluation of Potential Impacts
Air quality	Not relevant to the proposed works.
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. The Shire of Moora should be consulted regarding the proposed dust control measures.
Fauna	The works do impact on four potential Carnaby's Black Cockatoo nesting hollows. This loss has been mitigated through the installation of ten artificial nesting hollows in the immediate area. No other significant fauna issues are associated with any of the proposed upgrade works.
Vegetation – clearing	• 4.8 ha of native vegetation will be cleared. • The project will not involve temporary clearing, however 47.3ha will be revegetated. • The condition of the native vegetation to be cleared ranges from poor to fair. • The native vegetation to be cleared is well represented regionally, except for vegetation association 1023 and 1046 which possesses less than 10% of its pre-European extent. • 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	None present in the work zone (road reserve), areas outside the project area are cleared farmland.
Vegetation – weeds	Numerous common weed species occur throughout the proposed works areas however no declared plants are present in the project area. Although these common species are likely to be widespread within the 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	The area should be managed for dieback and all staff and contractors must be notified of dieback management requirements.
Reserves / Conservation areas	There are no conservation areas or reserves near the project area.
Heritage (non-indigenous)	There are no registered European Heritage sites within or adjacent to the work site. No Matters of National Environmental Significance will be impacted.
Aboriginal heritage	Aboriginal heritage field surveys were undertaken towards the end of 2004 along Great Northern Highway with no sites identified that will be impacted by the proposed works.
Surface water/drainage	Several minor water courses occur within the site however the proposed works will not disturb or interrupt any natural drainage or surface run-off patterns and the works are not located within a proclaimed surface water area.
Wetlands	No wetlands occur within the proposed works site
Groundwater	No dewatering or 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. The requirements of the Shire of Moora must be met in respect of noise management and construction working hours.
Visual amenity	The proposed works will result in minor and short-term visual impacts, revegetation will occur post construction.

Table 3: Aspects and Impacts – *Walebing to Bindi Bindi Upgrade 150.6 – 166.0 SLK*

Aspect	Evaluation of Potential Impacts
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 GNH.
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.
Salinity	There were no visual signs of salinity observed in the project area.
Acid Sulfate Soils	The site is not within an Acid Sulfate Soils risk area and the project requires no dewatering or excavation below the water table.
Statutory Land Use Planning	The proposed works are within the existing road reserve and recently purchased freehold land which is zoned as an Intensive Land Use Zone. No further amendments would be required to the Local Government Planning Scheme or Region Scheme.

9 REFERENCES

Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth. Includes subsequent updates for 2006 from Vegetation Extent dataset ANZWA1050000124

ATA Environmental (2006) Carnaby's Black Cockatoo Assessment, Great Northern Highway. Prepared for Sinclair Knight Merz, January 2006.

Biota Environmental Sciences (2005) Assessment of Roadside Vegetation as Breeding and Feeding Habitats of Carnaby's Cockatoo: Bindoon – Walebing. January 2005.

Department of the Environment and Water Resources (2000) EPBC Act Administrative guidelines on significance. Environment Australia, Australia.

Environmental Protection Authority (2000) Position Statement 2 Environmental Protection of Native Vegetation in Western Australia

O'Connor R. and E.O (2003) Report on an Ethnographic Survey of Four Areas of Proposed Road works between Walebing and Dalwallinu. Prepared for Sinclair Knight Merz, September 2003.

O'Connor R. and E.O (2005a) Report on an Ethnographic Survey of Proposed Road Widening and Passing Lane Areas between SLK 41.57 and SLK 145.50. Prepared for Sinclair Knight Merz, January 2005.

O'Connor R. and E.O (2005b) Report on an Ethnographic Survey of Proposed Road Widening and Passing Lane Areas between SLK 37.20 and SLK 146. Prepared for Sinclair Knight Merz, October 2005.

O'Connor R. and E.O (2005c) Report on an Ethnographic Survey of Proposed Road works between SLK 151.20 and SLK 159.30, Great Northern Highway. Prepared for Sinclair Knight Merz, November 2005.

Shepherd D.P, Beeston G.R and Hopkins A.J.M (2002) Native Vegetation in Western Australia – Extent, Type and Status

Sinclair Knight Merz (2005a) Great Northern Highway EPA Referral Strategy. Prepared for Works Infrastructure Maintenance and Main Roads WA, September 2005.

Sinclair Knight Merz (2006) Great Northern Highway Minor Improvement Works, Summary of Environmental Studies – Areas of Low Significance, August 2006.

Western Botanical (2004) Flora Survey for Proposed Disturbances on Great Northern Highway for Road Widening and Establishment of Passing Lanes. Prepared for Sinclair Knight Merz, December 2004.

Western Botanical (2006) Flora Survey for Extension of Proposed Disturbances on Great Northern Highway. Prepared for Sinclair Knight Merz, April 2006.

Quartermaine Consultants (2003) Report on Archaeological investigation for Aboriginal Sites, Great Northern Highway H006, Walebing to Dalwallinu, Road Widening Programme. Prepared for Sinclair Knight Merz, October 2003.

Figure 1: Location of DP09

Figure 2: Aerial Photo with overlay of DP3A design

APPENDIX A - 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 818/4.

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: Nigel Rowe
Phone: 9622-4740
Fax: 6218-7099
Email: nigel.rowe@mainroads.wa.gov.au

Property details

Property: Great Northern Highway 150.6-166.0 SLK

Colloquial name:

Area under assessment

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:	Site Plan Attached
4.8ha		Machine	Road Improvements	☐ Yes ☐ No

Avoidance/Minimise clearing

How have the clearing impacts been minimised? Woks have been reduced in size and designed to avoid large trees where possible or clear only on one side of the road.

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

Vegetation Complex	Clearing Description	Vegetation Condition	Comment
05, 07, 35, 48, 142, 352, 936, 946, 950, 676, 1023, 1040 and 1046	Machine clearing for road improvements	Poor to fair	

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 not at variance to this Principle**

Methodology The biological survey found the vegetation in the road reserve to be highly degraded and heavly weed infested with very little to no understorey, resulting in the proposal being not at variance with this 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.

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

Methodology Fauna survey has located Carnaby's Black Cockatoo nesting hollows in the work area. Ten articfical nesting hollows have been installed to mitigate this loss. The works are therefore not at variance to this principle.

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

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

Methodology Biological survey found no rare flora in the work area.

(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 Biological survey found no TEC's in the work area.

(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 The proposal clears a small amont of vegetation complex 1023 - Medium woodland; York gum, wandoo & salmon gum, 6.4% pre European extent remaining and 1046 - Succulent steppe with woodland; york gum & samphire, 6.1% pre European extent remaining. The small amount of vegetation within the site is rated as poor to fair condition and is highly degraded. Due to the degraded nature of the vegetation the proposal is determined to be not at variance.

(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 No clearing of vegetation in watercourses will take place and no wetlands are located within the work area.

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

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

Methodology Only a thin strip of vegetation is to be cleared with revegetation to follow at the completion of the works.

(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 The work area is not close enough to any conservation areas to have an impact on their values.

(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 Works will not impact any surface water areas and as there is no dewatering groundwater won't be efected.

(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 Area is in a low flood risk area well away from any major watercourses with only a small amount of vegetation to be cleared.

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

Comments

N/A

Methodology

SUBMISSIONS

If required have submissions been requested and addressed

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

ASSESSOR'S RECOMMENDATIONS

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

Possible variance with Principle 2 and 5, however variance has been mitigated through the installation of nesting hollows and minimising the extent of disturbance.

Recommendation (does this clearing require a Revegetation Management Plan / Offset Proposal / Environmental Management Plan / Management Strategy/New Application, under CPS 818/4)

Revegetation Management Plan required for submission to DEC

References

OFFICER PREPARING REPORT

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Position: Nigel Rowe – Environment Officer
Wheatbelt North Regional Office
MRWA
9622-4740

19 February 2007