Title of Proposal - Tonkin Highway Grade Separated Interchanges, Hale Road and Welshpool Road

Section 1 - Summary of your proposed action

Provide a summary of your proposed action, including any consultations undertaken.

1.1 Project Industry Type

Transport - Land

1.2 Provide a detailed description of the proposed action, including all proposed activities.

The Commissioner of Main Roads Western Australia (Main Roads) is proposing to construct a single fly-over and grade-separated interchange at the existing intersections of Tonkin Highway and Hale Road in Forrestfield and Tonkin Highway and Welshpool Road in Wattle Grove. In addition, Tonkin Highway will be re-constructed, and an additional lane established. The development envelope (DE) is presented in Figure 1 and comprises a total area of approximately 65 ha.

Tonkin Highway is a major arterial highway in the Perth metropolitan area, linking the south-east corridor of Perth with the north-east and north-west corridors of the metropolitan region. Tonkin Highway services the Kewdale industrial area as well as the Perth Airport. It is a strategic freight, tourist and inter town route. Welshpool Road East is a major arterial road intersecting Tonkin Highway in Wattle Grove.

As part of improving the efficiency of Tonkin Highway, Main Roads is proposing to construct a fly-over at the intersection of Hale Road, and a grade-separated interchange at Welshpool Road. These upgrades are necessary to reduce potential vehicular conflict and improve traffic times, congestion and both vehicle and pedestrian safety.

Key components of the Proposed Action include:
* Construction of a 4.2 km six Lane Dual Carriageway from south of Roe Highway to approximately 1 km north of Kelvin Road.
* Eggabout interchange at Welshpool Road.
* Principal Shared Path (PSP) on eastern side of the Tonkin Highway for the full length and grade separation at interchanges.
* Concrete footpath on side roads with links to PSP.
* Single span bridges for grade-separated interchanges.
* Installation of associated road infrastructure, such as lighting, noise and retaining wall, safety barriers, stopping bays and traffic monitoring devices.

1.3 What is the extent and location of your proposed action? Use the polygon tool on the map below to mark the location of your proposed action.

Area	Point	Latitude	Longitude
Site location	1	-31.990529585162	115.9849375667
Site location	2	-31.987417500426	115.98879994768
Site location	3	-31.988800662233	115.98877849001
Site location	4	-31.989783422421	115.98884286302
Site location	5	-31.990857166888	115.98925055879
Site location	6	-31.991912700044	115.99008740801
Site location	7	-31.9934413817	115.99141778368
Site location	8	-31.994879047151	115.99283399004
Site location	9	-31.995406792104	115.99341334719
Site location	10	-31.994496885116	115.99459351915
Site location	11	-31.994678867236	115.9947866382
Site location	12	-31.99535219794	115.99393906015
Site location	13	-31.996298492194	115.99510850328
Site location	14	-31.997208381307	115.99608482736
Site location	15	-31.999273796087	115.99745811838
Site location	16	-32.000811453532	115.99818767923
Site location	17	-32.002076134708	115.99847735781
Site location	18	-32.003231619524	115.99855245966
Site location	19	-32.005642623623	115.997940916
Site location	20	-32.007744239619	115.99734010118
Site location	21	-32.008008075453	115.99739374536
Site location	22	-32.008117248679	115.99764050859
Site location	23	-32.008817773786	116.00080551523
Site location	24	-32.009145290182	116.00068749803
Site location	25	-32.008726796802	115.99889578241
Site location	26	-32.008872359934	115.99878849405
Site location	27	-32.008563038003	115.99709333795
Site location	28	-32.010300685897	115.99669637102
Site location	29	-32.011838158397	115.99685730356
Site location	30	-32.012465876441	115.99711479563
Site location	31	-32.013857757636	115.99814476389
Site location	32	-32.014012409797	115.99797310251
Site location	33	-32.016686941183	115.99952878374
Site location	34	-32.019952674672	116.00142778772
Site location	35	-32.020025447351	116.00132049936
Site location	36	-32.022199504494	116.00237192529
Site location	37	-32.022317757169	116.00191058534
Site location	38	-32.020598530183	116.00102009195
Site location	39	-32.020562144078	116.00091280359
Site location	40	-32.020025447351	116.00065531153
Site location	41	-32.019989061019	116.00076259989
Site location	42	-32.014558238869	115.99769415277
Site location	43	-32.014467267583	115.99769415277
Site location	44	-32.014567335992	115.99757613558
Site location	45	-32.010146027472	115.99531235117
Site location	46	-32.008553940283	115.99509777445

Area	Point	Latitude	Longitude
Site location	47	-32.00796258657	115.99496902841
Site location	48	-32.007598674696	115.99307002443
Site location	49	-32.007180174255	115.99318804163
Site location	50	-32.007152880682	115.99335970301
Site location	51	-32.007171076398	115.99333824533
Site location	52	-32.007562283429	115.99533380884
Site location	53	-32.006197600494	115.99627794641
Site location	54	-32.004769210594	115.99705042261
Site location	55	-32.003786610991	115.99729718584
Site location	56	-32.00345907545	115.99688949007
Site location	57	-32.000720468602	115.9968680324
Site location	58	-31.999865205849	115.99638523477
Site location	59	-31.997208381307	115.99339188951
Site location	60	-31.996616954411	115.99260868448
Site location	61	-31.996626053315	115.9924370231
Site location	62	-31.997954483644	115.9908598842
Site location	63	-31.997790705602	115.9907096805
Site location	64	-31.996662448923	115.99197568315
Site location	65	-31.996607855506	115.99194349665
Site location	66	-31.996343986864	115.99231900591
Site location	67	-31.99619840384	115.99249066728
Site location	68	-31.994706164523	115.99080624002
Site location	69	-31.993277595598	115.98964752573
Site location	70	-31.992003693713	115.98830642122
Site location	71	-31.991494128004	115.98751248735
Site location	72	-31.990966360536	115.98640741724
Site location	73	-31.990684276679	115.98568858522
Site location	74	-31.990684276679	115.98485173601
Site location	75	-31.990520485654	115.9849375667
Site location	76	-31.990529585162	115.9849375667

1.5 Provide a brief physical description of the property on which the proposed action will take place and the location of the proposed action (e.g. proximity to major towns, or for off-shore actions, shortest distance to mainland).

The DE lies primarily within the City of Kalamunda and intersecting marginally with the City of Gosnells in the southern portion, on the Swan Coastal Plain in Western Australia. The Hale Road and Welshpool Road intersections are situated approximately 12 km south-east of Perth CBD. The total DE encompasses approximately 65 ha and is located along the existing Tonkin Highway alignment, west of the Kenwick wetlands and intersecting Hartfield Park.

Approximately half of the DE is cleared (49%), with limited remnant native (36.9%) and rehabilitated/planted and non-local endemic species (14.6%), as outlined in Section 3. The DE

is substantially covered by existing road infrastructure with the Proposed Action involving the upgrade and expansion of this existing infrastructure.

Land use adjacent to the Proposed Action includes:

* predominately urban land uses to the north, east and west

* northern section which is adjacent to Hartfield Country Club and Recreation Centre

* predominately rural land uses to the south east

* predominately industrial land uses to the south west.

1.6 What is the size of the proposed action area development footprint (or work area) including disturbance footprint and avoidance footprint (if relevant)?

The DE is approx. 65 ha and the disturbance footprint is approx 18.2 ha but will be minimised where possible.

1.7 Is the proposed action a street address or lot?

Lot

1.7.2 Describe the lot number and title. Various lots - See Appendix 1.

1.8 Primary Jurisdiction.

Western Australia

1.9 Has the person proposing to take the action received any Australian Government grant funding to undertake this project?

No

1.10 Is the proposed action subject to local government planning approval?

No

1.11 Provide an estimated start and estimated end date for the proposed action.

Start date 01/2022

End date 12/2023

1.12 Provide details of the context, planning framework and State and/or Local government requirements.

The Proposed Action will be referred to the Western Australian Environmental Protection

Authority (EPA) under Part IV of the Environmental Protection Act 1986 (EP Act), concurrently with this EPBC Act referral.

If the EPA decide to not formally assess the Proposed Action, then a clearing permit will be required under Part V of the EP Act for clearing of native vegetation. The clearing permit will be assessed by the Department of Water and Environmental Regulation (DWER).

A portion of the Proposed Action is located outside currently designated road reserve. As such, the Proposed Action will require a Development Approval under the Planning and Development Act 2005, which will be assessed by the Western Australian Planning Commission.

The Proposed Action may require excavation below the water table and temporary dewatering during construction. Depending on the rate and volume of dewatering, a Section 5C licence to abstract groundwater may be required under the Rights in Water and Irrigation Act 1914 (RIWI Act). This licence application will be assessed by DWER.

There are four registered Aboriginal Heritage sites, as defined by the Western Australian Aboriginal Heritage Act 1972, within the DE. As such, a Section 18 consent to disturb an Aboriginal Heritage site/s will be required. Indigenous heritage surveys are currently being undertaken.

Predicted traffic noise levels will be assessed against road traffic noise criteria established under State Planning Policy 5.4: Road and Rail Transport Noise and Freight Considerations in Land Use Planning (SPP 5.4). All existing properties and areas exceeding these guidelines will be outlined as areas that may require mitigation as part of the detailed design phase of the Proposed Action.

1.13 Describe any public consultation that has been, is being or will be undertaken, including with Indigenous stakeholders.

Stakeholder consultation has been undertaken to date with Local Government agencies and indigenous groups. As the Proposed Action is further developed, Main Roads will liaise with affected stakeholders, landholders and the public. Ongoing engagement will take place as the Proposed Action progresses through design and construction.

The following stakeholders have been identified as key stakeholders in regard to the Proposed Action:

* Environmental Protection Authority Services (WA)

* Department of Planning, Lands and Heritage (DPLH) (WA)

* Department of Water and Environmental Regulation (DWER) (WA)

* Department of Biodiversity, Conservation and Attractions (DBCA) (WA)

* Department of the Environment and Energy (DoEE) (C’th)

* Traditional Owners of the Whadjuk Working Party

* Community Representative Group (CRG) comprised of local residents and interest groups

* City of Kalamunda

* City of Gosnells

* Landowners, tenants and lease holders

* Local businesses.

A number of methods will be used to communicate with stakeholders including:

* direct contact with key stakeholders (face-to-face meetings)

* community consultation sessions

* project overview brochures and newsletters

* newspaper advertising

* media briefings / releases

* door knock

* direct mail/email

* Main Roads' website

* electronic and social media.

1.14 Describe any environmental impact assessments that have been or will be carried out under Commonwealth, State or Territory legislation including relevant impacts of the project.

Separate Preliminary Environmental Impact Assessments (PEIAs) (AECOM 2014) have been completed for the Hale and Welshpool Road intersections, and a biological survey was completed 2015 (AECOM) covering both areas. The boundaries within the PEIAs and biological survey are largely aligned with the DE.

The Proposed Action will be referred to the EPA under Part IV of the EP Act, concurrently with this EPBC Act referral. The EPA referral supporting documentation provides an assessment of potential impacts and mitigation to the environmental factors, objectives and principles defined under the EP Act. The key environmental factors addressed by the referral includes:

* flora and vegetation

* terrestrial fauna

* inland waters (including dewatering, acid sulfate soils, stormwater runoff)

* social surroundings (including visual amenity, noise, heritage).

If the EPA decide to not formally assess the Proposed Action, then a clearing permit will be required under Part V of the EP Act for clearing of native vegetation. The clearing permit will be assessed by DWER.

Should construction dewatering require a Section 5C licence under the RIWI Act, then the potential impacts and mitigation associated with dewatering will be assessed by DWER as part of the licence application.

No Commonwealth or State approvals or consent conditions are currently applicable to the Proposed Action.

1.15 Is this action part of a staged development (or a component of a larger project)?

No

1.16 Is the proposed action related to other actions or proposals in the region?

Yes

1.16.1 Identify the nature/scope and location of the related action (Including under the relevant legislation).

Main Roads will be upgrading the Tonkin Highway / Kelvin Road intersection located immediately south of the Proposed Action. The potential delivery timeframe of the Tonkin Highway / Kelvin Road intersection upgrade is 2022. Due to sensitive environmental values associated with the Tonkin Highway / Kelvin Road intersection upgrade, specifically related to the potential presence of Commonwealth and State listed Threatened Ecological Community (TEC) SCP20c, Main Roads is investigating realignment of the current design to avoid impact to SCP20c. Main Roads is also planning to commission 2019 Spring surveys to confirm the presence of SCP20c prior to referral to DEE.

The Proposed Action is adjunct to the following road projects that were recently approved by the Commonwealth Minister for Environment:

* Gateway WA – Perth Airport and Freight Access Project (EPBC 2010/5384)

* NorthLink WA – Perth Darwin National Highway (Swan Valley Section) – (EPBC 2013/7042).

Section 2 - Matters of National Environmental Significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The interactive map tool can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest. Consideration of likely impacts should include both direct and indirect impacts.

Your assessment of likely impacts should consider whether a bioregional plan is relevant to your proposal. The following resources can assist you in your assessment of likely impacts:

• Profiles of relevant species/communities (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;

• Significant Impact Guidelines 1.1 – Matters of National Environmental Significance;

• Significant Impact Guideline 1.2 – Actions on, or impacting upon, Commonwealth land and Actions by Commonwealth Agencies.

2.1 Is the proposed action likely to have ANY direct or indirect impact on the values of any World Heritage properties?

No

2.2 Is the proposed action likely to have ANY direct or indirect impact on the values of any National Heritage places?

No

2.3 Is the proposed action likely to have ANY direct or indirect impact on the ecological character of a Ramsar wetland?

No

2.4 Is the proposed action likely to have ANY direct or indirect impact on the members of any listed species or any threatened ecological community, or their habitat?

Yes

2.4.1 Impact table

Species	Impact
Calyptorhynchus latirostris (Carnaby's Cockatoo) (Endangered) and Calyptorhynchus banksii naso (Forest Red-tailed Black	Minor residual impacts likely. The Proposed Action will result in the removal of up to 15.5 ha of potential Black Cockatoo foraging habitat.

Species	Impact
Cockatoo) (Vulnerable)	With reference to the EPBC Act 1999: referral guidelines for the three threatened black cockatoo species (DSEWPaC 2012) the following information is provided: * The design and planning of the Proposed Action has resulted in the avoidance of all known Black Cockatoo nesting hollows. * The Proposed Action will result in the clearing of up to 15.5 ha Black Cockatoo foraging habitat. Based on the vegetation condition assessment, 9.5 ha of Black Cockatoo foraging habitat is in 'Completely Degraded' and 'Degraded' condition and the remaining vegetation is in 'Good' and 'Very Good' condition (Strategen 2019). Although the Proposed Action covers an area of approximately 65 ha only 44 suitable diameter at breast height (DBH) trees will be potentially impacted. * One potential roosting tree was recorded at the proposed Tonkin Highway/Hale Road interchange; however no evidence or observations of night roosting was recorded. * Removal of potential foraging habitat within the DE will not create a gap greater than 4 km between patches of Black Cockatoo habitat, with large patches occurring within 1 km to the east of the DE. The DE is located just inside the north-western most extent of the modelled distribution range for Baudin's Cockatoo. No evidence of the presence of this species has been observed and it is considered unlikely to occur within the DE. Refer to Section 5.1 for further assessment.
Conospermum undulatum	Five individual plants of this species were recorded in the DE (Figure 2) and will be directly impacted on. The species is geologically restricted and largely confined to the Swan Coastal Plain with collections in Kenwick, Maida Vale, High Wycombe and Forrestfield. The critical habitat for Conospermum undulatum is largely fragmented within the Swan Coastal Plain, although all known populations occur within a 9 km radius of the DE (AECOM 2015). Refer to Section 5.1 for further assessment.
Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community (TEC)	The Proposed Action will impact upon approximately 2.6 ha of Banksia Woodland TEC from a contiguous patch of TEC

Species	Impact
	approximately 15.9 ha in size, adjacent to the Hale Road intersection. The Level 1 Flora and Vegetation Survey (AECOM 2015) concluded that vegetation types ‘BAAS’, ‘EBWES’, ‘AHES’ represent FCT 20a. The survey also identified that the vegetation type ‘AEBS’ corresponds to FCT23b. Both FCT20a and FCT23b are representative of the Banksia Woodlands of the Swan Coastal Plain TEC, with an area of approximately 2.6 ha comprising vegetation in ‘Good’ to ‘Very Good’ condition within the DE. Refer to Section 5.1 for further assessment.

2.4.2 Do you consider this impact to be significant?

No

2.5 Is the proposed action likely to have ANY direct or indirect impact on the members of any listed migratory species, or their habitat?

No

2.6 Is the proposed action to be undertaken in a marine environment (outside Commonwealth marine areas)?

No

2.7 Is the proposed action to be taken on or near Commonwealth land?

No

2.8 Is the proposed action taking place in the Great Barrier Reef Marine Park?

No

2.9 Is the proposed action likely to have ANY direct or indirect impact on a water resource related to coal/gas/mining?

No

2.10 Is the proposed action a nuclear action?

No

2.11 Is the proposed action to be taken by the Commonwealth agency?

No

2.12 Is the proposed action to be undertaken in a Commonwealth Heritage Place Overseas?

No

2.13 Is the proposed action likely to have ANY direct or indirect impact on any part of the environment in the Commonwealth marine area?

No

Section 3 - Description of the project area

Provide a description of the project area and the affected area, including information about the following features (where relevant to the project area and/or affected area, and to the extent not otherwise addressed in Section 2).

3.1 Describe the flora and fauna relevant to the project area.

Flora

A Biological assessment, including a Level 1 Flora and Vegetation Survey was undertaken (AECOM 2015) for the vicinity of the Proposed Action. The following Threatened flora species were identified by AECOM (2015) as ‘May occur’ or ‘Likely to occur’:

* Banksia mimca (Flowers December or January to February) - Endangered

* Caladenia huegelii (flowers September to October) - Endangered

* Calytrix brevista subsp. brevista (flowers October to November) - Endangered

* Conospermum undulatum (flowers May to October) - Vulnerable

* Diuris purdiei (flowers September to October) - Endangered

* Drakaea elastica (flowers October to November) - Endangered

* Drakaea micrantha (flowers September to October) - Vulnerable

* Eleocharis keigheryi (flowers August to November) - Vulnerable

* Eremophila glabra subsp. chlorella (flowers July to November) – Endangered

* Grevillea curviloba subsp. incurva (flowers August to September) - Endangered

* Lepidosperma rostratum (perennial sedge) - Endangered

* Macarthuria keigheryi (flowers September to December or February to March) - Endangered

* Ptilotus pyramidatus (Flowers October) – Critically Endangered.

Of the species listed above, the desktop component of the AECOM (2015) survey identified Conospermum undulatum as being previously recorded in the Proposal DE. Two species were considered ‘Likely’ to occur within the DE, Banksia mimca (Endangered) and Drakaea elastica (Endangered). This was attributed to nearby records and suitable habitat within the Proposed Action.

As part of the Level 1 Flora and Vegetation Survey (AECOM 2015), a field survey was undertaken on the 10th, 12th, 13th and 21st of October 2014, which included targeted searches for conservation significant species. Additionally, a targeted survey for Drakaea elastica and other conservation significant species was undertaken on the 18th August 2015. Searches for Drakaea elastica are best undertaken in late August, when the basal orchid leaf is still green and more easily sighted, given that the plant can be difficult to detect during its flowering period.

Five individual Conospermum undulatum plants were recorded by AECOM (2015) within the Proposal DE (Figure 2).

The surveys were undertaken within the detection time for all the other EPBC listed species considered to possibly occur from the desktop assessment. Therefore, if present, it is likely that these species would have been detected at the time of the survey.

Fauna

A Level 1 Fauna and Black Cockatoo Survey was conducted on the 10th, 12th, 13th and 21st of October 2014 (AECOM 2015) for the vicinity of the Proposal DE. The survey primarily focused on mapping fauna habitat (Figure 3) and undertaking a targeted Black Cockatoo survey. Opportunistic observations of fauna within the survey area were also recorded.

The Biological Assessment (AECOM 2015) included a detailed desktop assessment of the likelihood of threatened and migratory fauna species being present. The desktop assessment indicated that the following Threatened species are likely to occur in the vicinity of the DE:

* Calyptorhynchus banksia naso (Forest Red-tailed Black Cockatoo) – Vulnerable

* Calyptorhynchus latirostris (Carnaby's Cockatoo) - Endangered

* Calyptorhynchus baudinii (Baudin's Cockatoo) – Endangered

* Ardea modesta (Eastern Great Egret) – Marine

* Ardea ibis (Cattle Egret) – Marine.

During the AECOM (2015) field survey, a flock of approximately 12 Forest Red-tailed Black Cockatoo were recorded flying over the Tonkin Highway/Welshpool Road East interchange. The survey also identified up to 15.5 ha of suitable habitat for Forest Red-tailed Black Cockatoo, Carnaby's Cockatoo and Baudin's Cockatoo (Figure 4) within the Proposal DE:

* 1.04 ha of Banksia Woodland consisting of Banksia attenuata and Banksia menziesii woodland

* 3.39 ha of Eucalyptus and Banksia Woodland

* 8.41 ha of Eucalyptus Woodland

* 2.60 ha of Eucalyptus Woodland over sedges

* 0.13 ha of Jarrah/Marri Woodland

* 44 Suitable DBH Trees, comprising Jarrah, Marri, Flooded Gum and introduced Eucalypt species and one stag.

The fauna assessment found one tree within the DE, to the west of Tonkin Highway and directly north of Hale Road, contained a hollow. Due to the restricted opening diameter, the hollow was not considered to be suitable for use by Black Cockatoos.

The potential impacts to the three Black Cockatoo species are discussed further in Section 5.

3.2 Describe the hydrology relevant to the project area (including water flows).

Overview

Three layers of aquifer occur beneath the DE. The unconfirmed or superficial aquifer is the topmost layer and is usually accessed for groundwater abstraction. Beneath the superficial aquifer lies the semi-confined Leederville aquifer. Below the Leederville aquifer lies the confined Yarragadee North aquifer.

The superficial aquifer receives direct recharge from groundwater infiltration and surface water. There is limited interaction between the various aquifers, in terms of water exchange. Both the Yarragadee and the Leederville aquifer receive direct recharge where these formations outcrop (not within the Proposed Action). Groundwater movement and recharge is very slow in these confined aquifers.

Groundwater levels range from 9 m to 16 m Australian Height Datum (AHD) across the DE. The depth of the bottom of the superficial aquifer in the Proposed Action is approximately 21 m below ground level. The depth of the bottom of the superficial aquifer is approximately 21 m to 28 m below ground level.

Wetlands

A total of 17 geomorphic wetlands are mapped within the DE (Figure 5). A Wetland Assessment was undertaken by AECOM (2015) as part of the Level 1 Flora and Vegetation Assessment which identified the following wetlands and their features within the DE:

* Conservation Category Wetland (CCW; UFI 8025), a palusplain wetland, the condition of this wetland is mapped as Degraded. The vegetation is devoid of intact native understorey and is heavily infested with Watsonia meriana

* Conservation Category Wetland (CCW; UFI 8026), a palusplain wetland

* Conservation Category Wetland (CCW; UFI 8027), a palusplain wetland

* Conservation Category Wetland (CCW; UFI 8028), a sumpland wetland, the 0.29 ha of this wetland that intersects the DE is degraded

* Conservation Category Wetland (CCW; UFI 8993), a palusplain wetland

* Conservation Category Wetland (CCW; UFI 14962), a palusplain wetland

* Conservation Category Wetland (CCW; UFI 15020), a palusplain wetland which lies within Hartfield Park. Five Conospermum undulatum individuals were recorded within UFI 15020 where it traverses the DE

* Conservation Category Wetland (CCW; UFI 15021), a palusplain wetland that is located wholly within the Project Area. The wetland assessment identified it as degraded and infested with Watsonia meriana. Although it is degraded, the desktop review showed that suitable Black Cockatoo foraging habitat exists within the wetland boundary

* Conservation Category Wetland (CCW; UFI 15074), a palusplain wetland

* Multiple Use Wetland (MUW; UFI 15253), a seasonally waterlogged palusplain wetland that is devoid of understorey species and is dominated by weeds and introduced species

* Multiple Use Wetland (MUW; UFI 8030), a palusplain wetland within a degraded portion of the road reserve with high level of disturbance and weed infestation

* Multiple Use Wetland (MUW; UFI 13619), a palusplain wetland

* Resource Enhancement Wetland (REW; UFI 8984), a palusplain wetland

* Resource Enhancement Wetland (REW; UFI 8987); a palusplain wetland

* Resource Enhancement Wetland (REW; UFI 8037), a sumpland wetland

* Resource Enhancement Wetland (REW; UFI 1527), a palusplain wetland

* Resource Enhancement Wetland (REW; UFI 15983), a palusplain wetland.

A small portion of the DE along Tonkin Highway and Welshpool Road East intersects with the Brixton Street Wetlands Swamp (CCW; UFI 14962), which is listed in the Directory of Important Wetlands in Australia. This listed wetland has been reported to contain numerous Threatened flora and potential TECs.

No other Conservation Category wetlands occur within 1 km of the DE.

3.3 Describe the soil and vegetation characteristics relevant to the project area.

Geology and soils

The surface geology of the DE comprises three geological types (Geological Survey of Western Australia and Geoscience Australia 2008):

* Bassendean Sand derived from aeolian sand and coastal sediment, described as basal

conglomerate overlain by dune quartz sand with heavy mineral concentrations

* Guilford Formation derived from alluvial and estuarine sediment and consisting of alluvial and clay, with shallow marine and estuarine lenses and local basal conglomerates

* Yoganup formation derived from aeolian coastal sediment, and conglomerate sands, consisting of basal conglomerate overlain by dune quartz sand and heavy mineral concentrations.

The Tonkin Highway / Hale Road and Tonkin Highway / Welshpool Road interchanges are underlain by the Bassendean Sand and Guildford Formation.

The soils underlaying in the DE are described as sandy dunes with intervening sandy and clayey swamp flats, with the predominant soils being leached sands, sometimes with a clay horizon on the dunes and sandy swamps (Bureau of Rural Science 1991).

The DE is mapped as having a ‘moderate to low’ risk of acid sulfate soil (ASS) occurring within 3 m of natural soil surface, reflecting the presence of wetlands in the regional area.

Vegetation

Vegetation within the DE has been broadly characterised by Beard (1990) as medium woodland of Jarrah (Eucalyptus marginata), Marri (Corymbia calophylla) and Wandoo (Eucalyptus wandoo). Vegetation complexes as described by Heddle et al. (1980) within the DE comprise:

* Guildford Complex – Open forest and tall open forest of Corymbia calophylla, Eucalyptus wandoo, Eucalyptus marginata and Eucalyptus wandoo woodland. Fringing woodlands of Eucalyptus rudis and Melaleuca rhaphiophylla occur along streams

* Southern River Complex – Open woodland of Corymbia calophylla, Eucalyptus marginata, Banksia species with fringing woodland of Eucalyptus rudis and Melaleuca rhaphiophylla along creek beds.

The remaining pre-European extents of the Southern River Complex is 18.42% (GoWA 2018), which is above the 10% target for retention of vegetation complexes within constrained areas of the Swan Coastal Plain (EPA 2000). The Guildford Complex has only 5% of the pre-European extent remaining.

The DE comprises a total area of approximately 65 ha, of which approximately 33 ha is covered by vegetation and approximately 32 ha (49%) is cleared. Vegetation within the DE can be broken down into:

* remnant native vegetation, 24 ha (36.9% of the DE)

* rehabilitated/planted, 9.5 ha (14.6% of the DE)

* non-local endemic species, 0.09 ha (0.14% of the DE).

The Level 1 Flora and Vegetation Survey (AECOM 2015) identified 17 remnant native

vegetation types (Figure 6) that lie within the DE, including:

* ABHS: Adenanthos cygnorum, Beaufortia elegans and Hypocalymma angustifolium Low Shrubland

* AEBS: Adenanthos cygnorum, Eremaea pauciflora subsp. pauciflora and Beaufortia elegans Shrubland over Dasypogon bromeliifolius and Lepidosperma sp. Sedgeland

* AMS: Allocasuarina fraseriana Tall Shrubland over Melaleuca preissiana Shrubland over introduced weeds

* ATS: Adenanthos cygnorum Tall Shrubland over Eremaea pauciflora subsp. pauciflora Low Shrubland over introduced weeds

* BAAS: Banksia attenuata and Banksia menziesii Woodland over Allocasuarina fraseriana, Adenanthos cygnorum and Xanthorrhoea preissii Shrubland over Anigozanthos manglesii and Dasypogon bromeliifolius Open Low Heath

* CEW: Corymbia calophylla and Eucalyptus marginata Woodland with occasional understorey species over introduced weed and grass species

* CEPW: Corymbia calophylla, Eucalyptus marginata and planted Eucalyptus species over introduced weed and grass species

* CWAAS: Corymbia calophylla Woodland over Adenanthos cygnorum, Allocasuarina humilis, Acacia pulchella and Xanthorrhoea preissii Shrubland over introduced weed and grass species

* CWCS: Corymbia calophylla Woodland over Adenanthos cygnorum subsp. cygnorum, Xanthorrhoea preissii and Calothamnus sanguineus open shrubland over *Ehrharta calycina, *Avena barbata and *Oxalis pes-caprae

* CWMHS: Callitris pyramidalis Low Open Woodland over Melaleuca viminea and Hypocalymma angustifolium Low Shrubland

* EBWES: Eucalyptus sp., Banksia menziesii, Banksia attenuata Woodland over Allocasuarina humilis, Hibbertia hypericoides and Eremaea pauciflora subsp. pauciflora Low Heath

* ErWMS: Eucalyptus rudis Woodland over Melaleuca rhaphiophylla and Adenanthos cygnorum Shrubland over introduced weed and grass species

* EWMS: Corymbia calophylla, Eucalyptus rudis and Eucalyptus marginata Woodland over Melaleuca rhaphiophylla, Viminaria juncea and Trymalium odoratissimum subsp. odoratissimum Open Shrubland in wetland depression

* R-MS1: Chamelaucium uncinatum, Adenanthos cygnorum and *Leptospermum laevigatum shrubland

* R-MS2: Degraded Road reserve consisting of isolated species of Acacia pulchella, Calothamnus quadrifidus, Adenanthos cygnorum and Callistemon phoeniceus over introduced

grasses

* S-MTS: Melaleuca rhaphiophylla, Melaleuca preissiana and Melaleuca lanceolata Tall Shrubland in wetland depression

* PVS: Pericalymma ellipticum and Verticordia sp. Closed Shrubland over Low Sedgeland.

Vegetation condition within the DE was assessed as part of the Level 1 Flora and Vegetation Survey (AECOM 2015) and a follow up assessment was completed in May 2019 in accordance with the Keighery Scale (1994). Vegetation condition ranges from 'Very Good' to 'Degraded', with approximately 84 % of the DE assessed as being either Cleared or 'Degraded' (Figure 7). The DE contains approximately 24 ha of native vegetation, of which 17 % comprises vegetation in 'Good' or 'Very Good' condition.

Vegetation types 'EBWES', 'AEBS' and 'CEW' were identified as being vegetation types supporting populations of the EPBC listed Conospermum undulatum (Vulnerable) species and were therefore assessed by AECOM (2015) as being nationally significant

Threatened Ecological Communities

The desktop study conducted by AECOM (2015), identified the following TECs as potentially occurring in the DE:

* Clay Pans of the Swan Coastal Plain Ecological Community (Commonwealth listed Critically Endangered)

* Banksia Woodlands of the Swan Coastal Plain Ecological Community (Commonwealth listed Endangered).

The Level 1 Flora and Vegetation Survey (AECOM 2015) assessed native vegetation communities within the survey area that were considered to potentially represent the Banksia Woodlands of the Swan Coastal Plain TEC, based on floristic and structural similarities.

A floristic community type (FCT) analysis was undertaken using quadrat data, which identified that Vegetation Communities 'BAAS', 'EBWES' and 'AHES', correspond to FCT20a – Banksia attenuata woodland over species rich dense shrublands. The FCT analysis also identified that Vegetation Community 'AEBS' corresponds to FCT23b – North-eastern Banksia attenuata – Banksia menziesii woodlands. Both FCT20a and FCT23b form part of the 'Banksia Woodlands of the Swan Coastal Plain' TEC.

It was considered that vegetation types 'BAAS', 'EBWES' and 'AEBS' comprise the now Commonwealth listed TEC, Banksia Woodlands of the Swan Coastal Plain TEC, with an area of 2.61 ha comprising 'Good' and 'Very Good' condition vegetation, within the DE.

3.4 Describe any outstanding natural features and/or any other important or unique values relevant to the project area.

The PMST report noted the presence of the following State Reserves within the search area:

* Kenwick Wetlands

* Korung National Park

* Lesmurdie Falls National Park

* Unnamed WA29815

* Unnamed WA37997.

Korung National Park and Lesmurdie Falls National Park are located within 2 km of the DE. However, the DE does not intersect with these features and therefore no direct or indirect impacts will occur as a result of the Proposed Action or activities associated with the Proposed Action.

3.5 Describe the status of native vegetation relevant to the project area.

The DE comprises approximately 24 ha of native vegetation which ranges in condition from ‘Degraded’ to ‘Very Good’, As outlined above, the Level 1 Flora and Vegetation Survey (AECOM 2015) concluded that vegetation types BAAS, EBWES, AEBS and AHES represent the Banksia Woodlands of the Swan Coastal Plain TEC, with an area of 2.61 ha comprising ‘Good’ to ‘Very Good’ condition vegetation, within the DE.

The proposal DE has been mapped as the Southern River Complex and Guildford Complex. The remaining pre-European extents of the Southern River Complex is 18.42% (GoWA 2018), which is above the 10% target for retention of vegetation complexes within constrained areas of the Swan Coastal Plain (EPA 2000). The Guildford Complex has only 5% of the pre-European extent remaining.

3.6 Describe the gradient (or depth range if action is to be taken in a marine area) relevant to the project area.

The gradient within the Proposal DE ranges from approximately 20 metres Australian height datum (mAHD) to 28 mAHD.

The Proposal may result in some localised changes to the existing gradient of the DE to facilitate the creation of new road infrastructure, including road embankments and a duck and dive intersection.

3.7 Describe the current condition of the environment relevant to the project area.

Almost half of the DE is cleared (49%) with the remainder of the DE containing remnant and rehabilitated vegetation comprising native and exotic species, as outlined in Section 3. The DE is substantially covered by existing road infrastructure, with the Proposed Action involving the upgrade and expansion of this existing infrastructure.

Vegetation condition within the DE was assessed as part of the Level 1 Flora and Vegetation Survey (AECOM 2015) in accordance with the Keighery Scale (1994) and ranges from 'Very Good' to 'Degraded'. Cleared and 'Degraded' areas constitute 32 ha and 23 ha of the DE respectively, which combined represents 84% of the DE. Approximately 17 % of the DE comprises vegetation in 'Good' or 'Very Good' condition. Vegetation condition within the DE is shown in Figure 7.

Thirty-three introduced species were recorded from the AECOM (2015) survey. Of these, two species are listed as Declared Pests, including the Bridal Creeper (*Asparagus asparagoides) and the Opuntioid Cactus (*Opuntia stricta).

3.8 Describe any Commonwealth Heritage Places or other places recognised as having heritage values relevant to the project area.

There are no Commonwealth or State listed Heritage Places within 1 km of the Proposal DE.

3.9 Describe any Indigenous heritage values relevant to the project area.

In Western Australia, the Aboriginal Heritage Act 1972 (AHA) protects Aboriginal sites defined under Section 5 of the Act. Under Section 5 of the AHA, an Aboriginal site is:

* any place of importance and significance where persons of Aboriginal descent have, or appear to have, left any object, natural or artificial, used for, or made or adapted for use for, any purpose connecting with the traditional cultural life of the Aboriginal people, past or present

* any sacred, ritual or ceremonial site, which is of importance and special significance to persons of Aboriginal descent

* any place which, in the opinion of the Committee, is or was associated with the Aboriginal people and which is of historical, anthropological, archaeological, or ethnographical interest and should be preserved because of its importance and significance to the cultural heritage of the state

* any place where objects to which the AHA applies are traditionally stored, or to which, under the provisions of the AHA, such objects have been taken or removed.

It is an offence under Section 17 of the Act to excavate, destroy or damage a site unless the person is acting with the authorisation of the Registrar under Section 16, or the consent of the Minister under Section 18 of the AHA.

The Proposal DE traverses four registered Aboriginal Heritage sites (site ID 3773, 4343, 3631 and 4342). As such, a Section 18 consent to disturb an Aboriginal Heritage site/s will be

required. Indigenous heritage surveys are currently being undertaken.

One 'Other Heritage Places' (OHPs) is mapped within the DE. This OHP is 'Artefacts / Scatter' (Site ID 4341). This site has a 'lodged' status, and therefore this site has been assessed as not meeting the definition of an Aboriginal heritage site as defined in Section 5 of the Aboriginal Heritage Act 1972.

3.10 Describe the tenure of the action area (e.g. freehold, leasehold) relevant to the project area.

The DE covers numerous parcels of land. The DE is predominantly located within designated road reserves zoned Primary Regional Roads under the Metropolitan Region Scheme. Additional land tenures are freehold land generally in private ownership.

Main Roads will undertake consultation with any affected land holders and will acquire all land required for the proposed action prior to commencement of the action through negotiated settlement, or in accordance with powers under the Planning and Development Act 2005.

3.11 Describe any existing or any proposed uses relevant to the project area.

The Proposal DE is predominantly located within designated road reserves zoned Primary Regional Roads under the MRS, comprising existing road infrastructure. The Proposed Action is largely consistent with the existing land use within the DE, however the Proposed Action will result in development of some areas which are not currently designated road reserve.

Those areas within the DE that are not currently designated road reserve have been placed into a Planning Control Area (PCA) under the Planning and Development Act 2005. The PCA designates the DE as a future planned road and prevents incompatible development from occurring within the DE without appropriate planning approvals.

Section 4 - Measures to avoid or reduce impacts

Provide a description of measures that will be implemented to avoid, reduce, manage or offset any relevant impacts of the action. Include, if appropriate, any relevant reports or technical advice relating to the feasibility and effectiveness of the proposed measures.

Examples of relevant measures to avoid or reduce impacts may include the timing of works, avoidance of important habitat, specific design measures, or adoption of specific work practices.

4.1 Describe the measures you will undertake to avoid or reduce impact from your proposed action.

Impact avoidance

The DE represents the maximum extent of disturbance, noting that the final impact will be less than the DE. Where possible, vegetation and fauna habitat will be retained, particularly areas representing the Banksia Woodlands of the Swan Coastal Plain TEC, habitat for Conospermum undulatum or quality black cockatoo habitat and significant trees. The DE has been aligned where possible to minimise the impact on the TEC by limiting disturbance of the TEC patch by avoiding patch fragmentation, and retaining an area of TEC that is contiguous, of a viable size and in 'Very Good' condition. The DE has also been aligned to retain some of the significant trees adjacent to the impact area.

Table 1 highlights the efforts taken to avoid, minimise, mitigate and manage project clearing impacts.

Table 1: Project Avoidance, Minimisation, Mitigation and Management of Project Clearing Impacts

Design or Management Measure: Steepen batter slopes

Discussion and Justification: The design has sought to reduce earthworks (fill height/cut depth) in areas where native vegetation exists. Any embankments above 2.5 m have been steepened to 3:1 with an additional 1 m of barrier earthworks required for barrier protection.

Design or Management Measure: Installation of safety barriers

Discussion and Justification: Any embankments above 2.5 m have been steepened to 3:1 with an additional 1 m of barrier earthworks required for barrier protection. Without the wire rope barrier, the minimum slope would be 4:1, requiring a larger clearing footprint.

Design or Management Measure: Installation of kerbing

Discussion and Justification: Kerbing has been considered and will be implemented in the design where appropriate, reducing the need for table drains, which typically require a larger

clearing footprint.

Design or Management Measure: Preferential use of existing cleared areas for access tracks, construction storage and stockpiling

Discussion and Justification: All laydowns, stockpiles and access tracks will be constructed within existing cleared areas or within the permanent footprint of the works. No native vegetation will be cleared for temporary works outside of the permanent footprint.

Design or Management Measure: Drainage modification

Discussion and Justification: A preliminary drainage design has proposed various drainage basins along the length of the Proposed Action to capture run-off. The impacts of clearing for the proposed drainage is considered to be a conservative given many of the basins will be located in areas already cleared.

Environmental management

The works associated with the Proposal will be managed in accordance with a Construction Environmental Management Plan (CEMP) which will be developed with the aim to mitigate potential impacts associated with the Proposal.

The CEMP will detail measures pertaining to the following Proposal aspects:

* vegetation clearing

* weed management

* dieback management

* dewatering management

* dust management

* erosion and sedimentation controls

* fire management

* fauna management

* acid sulfate soil management

* hazardous materials and spill management

* noise and vibration management.

If required, an ASS and Dewatering Management Plan (ASSDMP) will be prepared and implemented in accordance with DWER guidelines.

The Proposed Action will be managed in accordance with any requirements under the EP Act, including EPA advice and/or conditions under Part IV, or a clearing permit under Part V.

A Section 5C licence under the RIWI Act will be obtained for construction dewatering if required.

4.2 For matters protected by the EPBC Act that may be affected by the proposed action, describe the proposed environmental outcomes to be achieved.

The Proposal will necessitate clearing of the following matters protected by the EPBC Act:

* 2.61 ha of the Commonwealth listed TEC ‘Banksia Woodlands of the Swan Coastal Plain’, with the remaining 15.9 ha of the TEC patch retained in a contiguous area

* Approximately 15.5 ha of potential habitat for Black Cockatoos associated with Banksia woodland, Eucalyptus Woodland vegetation ranging from ‘Degraded’ to ‘Very Good’ condition

* Up to 44 Suitable DBH Trees comprising 16 Flooded Gum trees, two Jarrah trees, 23 Marri trees, two introduced Eucalypt (non-endemic) trees and one stag. None of these trees contained hollows suitable for nesting for the species.

Section 5 – Conclusion on the likelihood of significant impacts

A checkbox tick identifies each of the matters of National Environmental Significance you identified in section 2 of this application as likely to be a significant impact.

Review the matters you have identified below. If a matter ticked below has been incorrectly identified you will need to return to Section 2 to edit.

5.1.1 World Heritage Properties

No

5.1.2 National Heritage Places

No

5.1.3 Wetlands of International Importance (declared Ramsar Wetlands)

No

5.1.4 Listed threatened species or any threatened ecological community

No

5.1.5 Listed migratory species

No

5.1.6 Commonwealth marine environment

No

5.1.7 Protection of the environment from actions involving Commonwealth land

No

5.1.8 Great Barrier Reef Marine Park

No

5.1.9 A water resource, in relation to coal/gas/mining

No

5.1.10 Protection of the environment from nuclear actions

No

5.1.11 Protection of the environment from Commonwealth actions

No

5.1.12 Commonwealth Heritage places overseas

No

5.2 If no significant matters are identified, provide the key reasons why you think the proposed action is not likely to have a significant impact on a matter protected under the EPBC Act and therefore not a controlled action.

As outlined by the assessment above, based on the biological surveys undertaken by AECOM (2015) and Strategen (now Strategen-JBS&G) (2019), the Proposed Action will impact on two species of Black Cockatoo, namely Carnaby's Cockatoo, Forest Red-tailed Black Cockatoo. The DE is located on the north-western edge of the distribution of Baudin's Cockatoo and is considered highly unlikely to be present.

The Proposed Action is not considered likely to result in a significant impact to MNES protected under the Environment Protection and Biodiversity Conservation Act 1999 (C'th).

Calyptorhynchus latirostris (Carnaby's Cockatoo) (Endangered)

Calyptorhynchus baudinii (Baudin's Cockatoo) (Endangered)

Calyptorhynchus banksii naso (Forest Red-tailed Black Cockatoo) (Vulnerable)

The Commonwealth Significant Impact Guidelines 1.1 adopts criteria for assessment of impact to threatened species relating to 'populations' and/or 'important populations' (DotE 2013). However, these terms have not been defined for Black Cockatoos, due to the mobile and widely-distributed nature of these species, and the variation in flock compositions (e.g. between breeding and non-breeding seasons). For Black Cockatoos, it is more appropriate to consider significance in terms of impacts on habitat rather than a resident population (DSWEPaC 2012, DEE 2017).

Species recovery, as defined by the Carnaby's Cockatoo Recovery Plan (DPaW 2013), is dependent upon stopping the further decline in the distribution and abundance of Carnaby's Cockatoo by protecting the birds throughout their life stages and enhancing habitat critical for their survival throughout their breeding and non-breeding range and ensuring that the reproductive capacity of the species remains stable or increases. Habitat critical to the survival of Carnaby's Cockatoo is defined as (DPaW 2013):

* Known breeding and nearby feeding habitat

* Former breeding habitat that has hollows intact

* Vegetation that provides habitat for feeding, watering and regular night roosting.

Critical habitat for Forest Red-tailed Black Cockatoo includes Marri, Karri and Jarrah forests, woodlands and remnants in the south-west of Western Australia receiving more than 600 mm of annual average rainfall (DEC 2008).

Although not considered to be relevant for Black Cockatoos given their highly mobile nature, the impacts of the Proposed Action on Black Cockatoos have also been broadly assessed against the Commonwealth Significant Impact Guidelines 1.1 (DotE 2013).

Lead to a long-term decrease in the size of an important population of species:

The Proposed Action is not expected to lead to a long-term decrease in the size of Black Cockatoo populations.

The reduction in foraging habitat is unlikely to contribute to a long-term decrease in the population. The Proposed Action will necessitate the clearing of up to 15.5 ha of potential foraging habitat, which represents 0.11% of the total available potential foraging habitat within 12 km of the DE based on remnant native vegetation associations known to be utilised by Black Cockatoos. None of the trees proposed to be removed from within the DE contain hollows suitable for breeding.

Regional mapping indicates that a total of 3,301 ha and 14,434 ha of potential Black Cockatoo foraging habitat occurs within 6 km and 12 km of the DE, respectively, with 7,330 ha of this habitat (within 12 km) located within DBCA managed lands as conservation estate (Figure 8). On this basis it is unlikely that the Proposal will lead to a long-term decrease in the size of a population.

Reduce the area of occupancy of an important population:

The Proposed Action is not expected to reduce the area of occupancy of Black Cockatoos. The Proposed Action is located within the mapped distribution of Carnaby's Cockatoo, Forest Red-tailed Black Cockatoo and Baudin's Cockatoo (DSEWPaC, 2012; DoEE, 2017), with Forest Red-tailed Cockatoo being recorded in the field. There is approximately 3,301 ha of mapped potential Black Cockatoo foraging habitat within 6 km of the DE, based on native remnant vegetation associations known to be utilised by Black Cockatoos. A removal of 0.47 % of this potential foraging habitat is unlikely to result in a significant impact given the vegetation occurs in a road reserve adjacent to a high speed and volume highway, with quality foraging habitat within bushland and reserves in close proximity to the Proposed Action. Removal of up to 15.5 ha of potential foraging habitat within the DE represents 0.11% of the total available potential foraging habitat within 12 km of the DE, based on native remnant vegetation associations known to be utilised by Black Cockatoos. On this basis the Proposal is unlikely to reduce the area of occupancy of this species.

Fragment an existing important population into two or more populations:

The Proposed Action is not expected to fragment populations of Black Cockatoos. Clearing for the Proposed Action will occur over linear patches adjacent to existing cleared and disturbed areas along Tonkin Highway, Hale Road and Welshpool Road. Black Cockatoos are highly mobile species, and are not dependent on a particular patch of foraging habitat within the DE and are expected to forage outside the DE amongst large patches of potential foraging habitat within 1 km of the DE. The gap created by the Proposed Action will be approximately 200m wide and is unlikely to fragment an existing population into two or more populations.

Adversely affect habitat critical to the survival of a species:

The Proposed Action is not expected to directly or indirectly impact habitat critical to the survival of Black Cockatoos. The Proposed Action comprises suitable foraging, potential breeding habitat (although no known nesting hollows are present) and potential night roosting habitat. Although there are known water sources within adjacent to the DE, there is suitable habitat in close proximity to the DE in the local and regional area which would be considered more likely to be critical habitat. The Proposal will also implement mitigation measures to reduce indirect impacts that may reduce the quality of adjacent / retained habitat.

Disrupt the breeding cycle of an important population:

The Proposed Action is not expected to disrupt the breeding cycle of a population of Black Cockatoos as no known breeding of Black Cockatoos occurs in the DE. Although the Proposed Action will result in the loss of up to 44 suitable DBH trees there was no evidence of breeding observed within the Proposal Action during the field survey (AECOM 2015). The removal of potential breeding trees and foraging habitat may result in some disruption to the species breeding cycle. However, when considered in the context of habitat availability within the local area (based on suitable remnant vegetation within a 12 km radius), the potential loss of 15.5 ha Black Cockatoo foraging habitat (representing a 0.11% reduction in potential foraging and breeding habitat for Forest Red-tailed Black Cockatoo within the local area) is not considered a significant impact to the species.

Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline:

The Proposed Action is not expected to impact the availability or quality of habitat to the extent that Black Cockatoos are likely to decline. The clearing of approximately 15.5 ha of potential habitat represents a 0.11% reduction in potential foraging and breeding habitat for Forest Red-tailed Black Cockatoos within the local area (suitable remnant vegetation within a 12 km radius). The reduction in foraging and potential breeding habitat for Forest Red-tailed Black Cockatoos

may result in a minor residual impact associated with the Proposed Action. On this basis, the Proposal is unlikely to modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that this species is likely to decline.

Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat:

The Proposed Action is unlikely to introduce harmful or invasive species to the DE. The CEMP will include measures to manage the potential spread of weeds, dieback and feral animals into adjacent retained vegetation that could comprise habitat for the species.

Introduce disease that may cause the species to decline:

The Proposal is unlikely to introduce a disease (e.g. beak and feather disease virus) that may cause the species to decline. There are no known diseases that may be introduced to the area that may cause the population to decline and it is unlikely that any disease already exists in the Proposal Area that may be spread by the activities of the Proposal (as there has been no indication of any such disease).

Interfere substantially with the recovery of the species:

The Recovery Plans (DBCA, 2013 and DEC, 2008) provide measures for the species recovery. These include identifying, protecting and managing important habitat. The Proposed Action is not inconsistent with the recovery plans for Black Cockatoos.

Conospermum undulatum (Wavy-leaved Smokebush) (Vulnerable)

Lead to a long-term decrease in the size of an important population of species:

The Proposed Action is not expected to reduce the area of occupancy of Conospermum undulatum with up to five individual plants being impacted by the Proposed Action. The individuals to be removed occur within highly fragmented areas of vegetation. On this basis it is unlikely that the Proposal will lead to a long term decrease in the size of a population.

Reduce the area of occupancy of an important population:

The Proposed Action is not expected to reduce the area of occupancy of Conospermum undulatum with up to five individual plants being impacted by the Proposed Action. Directly outside of the DE, an additional 45 Conospermum undulatum plants from the same population occur within the Clifford Street Bushland. In total, 242 individual plants were recorded in the Clifford Street Bushland (AECOM 2015). It is unlikely that the removal of five individual plants will reduce the area of occupancy of an important population.

Fragment an existing important population into two or more populations:

The Proposed Action is not expected to fragment an existing important population into two or more populations of Conospermum undulatum as the upgrade of highway will not isolate any bushland areas. The Proposal will necessitate the removal of five individual plants from the DE, which are part of the same population of an additional 45 plants occurring in the Clifford Street Bushland. The five individual plants to be removed occur within already highly fragmented areas of vegetation. Given that the individual plants to be removed form part of a larger population within the Clifford Street Bushland, the Proposal is unlikely to further fragment an existing important population into two or more populations.

Adversely affect habitat critical to the survival of a species:

The Recovery Plan (DEC 2009) defines habitat critical to the survival of the species as one that includes the area of occupancy of important populations or areas of similar habitat surrounding important populations of Conospermum undulatum. The Proposed Action will result in the clearing of approximately 2.3 ha of habitat known to contain 5 individuals C. undulatum. This habitat is not considered to be critical to the survival of the species as the presence of 5 individuals is not considered to be an important population, the habitat being cleared is relatively small and isolated from important populations.

Important populations within the local region are considered to be within the Clifford Street Bushland reserve, known to contain to 200 individuals (AECOM 2015) located approximately 3.3 km south east, and within remnant vegetation located at the Perth Airport, which again contains over 200 individuals (Perth Airport 2018). Given this it is considered that the Proposed Action is unlikely to adversely impact habitat critical to the survival of the species.

Disrupt the breeding cycle of an important population:

It is considered unlikely that the removal of five individual plants will disrupt the breeding cycle of an important population.

Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline:

Directly outside of the DE, an additional 45 Conospermum undulatum plants from the same population occur within the Clifford Street Bushland. The Clifford Street Bushland contains 242 individual plants. It is considered unlikely that the Proposal will modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.

Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat:

The CEMP will include measures to manage the potential spread of weeds, dieback and feral animals into adjacent retained vegetation that could comprise habitat for the species.

Introduce disease that may cause the species to decline:

The Proposed Action is unlikely to introduce diseases that may cause the species to decline. The CEMP will include measures to manage the potential spread of weeds, dieback and feral animals into adjacent retained vegetation that could comprise habitat for the species.

Interfere substantially with the recovery of the species:

The Proposal is unlikely to interfere with the recovery of the species.

Banksia Woodlands of the Swan Coastal Plain Threatened Ecological Community (TEC)

Reduce the extent of an ecological community:

The proposed clearing will result in removal of up to 2.61 ha of TEC, leaving a contiguous area of TEC of viable size (approximately 15.9 ha within Hartfield Park) adjacent to the west of the DE. At a local context the Proposed Action occurs within the range of the TEC with extensive areas of potential TEC lying to the north, south and east of the DE. The DE is located adjacent and parallel to existing cleared corridors and will not disrupt linkages between the TEC and adjacent green corridors. Based on mapping of remnant native vegetation known to be associated with Banksia Woodlands of the Swan Coastal Plain TEC, there is approximately 839 ha of potential Banksia Woodland TEC occurring within 6km of the DE. Furthermore, the sub-communities to be cleared (FCT20a and FCT23b) are relatively common as vegetation communities.

Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines:

The Proposed Action is not expected to increase fragmentation of the TEC.

The DE is predominantly limited to the Regional Road reserve under the MRS and therefore much of the Proposal is comprised of existing cleared areas of Tonkin Highway and Hale Road and Welshpool Road Intersections. Most of the associated infrastructure for the Proposed Action will be contained within the Regional Road Reserve, including road pavements, footpaths, noise walls, drainage and service provisions. The proposed clearing will result in removal of up to 2.61 ha of TEC, leaving a contiguous area of TEC of viable size (approximately 15.9 ha within Hartfield Park) adjacent to the west of the DE. The Proposed Action will not fragment patches of Banksia Woodland TEC and edge effects to adjacent native vegetation will be minimised.

Adversely affect habitat critical to the survival of an ecological community:

The Proposed Action is not expected to adversely affect habitat critical to the survival of the TEC.

The Proposed Action will directly impact no more than 2.61 ha of Banksia Woodland TEC. Locally there is approximately 839 ha of remnant vegetation within 6 km of the DE that may contain the TEC, of which 40 ha is contained within DBCA managed lands.

Modify or destroy abiotic factors (such as water, nutrients or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns:

The Proposed Action is not expected to modify abiotic factors necessary for the survival of the TEC. The Proposed Action will not substantially modify or destroy abiotic factors necessary for the survival of the Banksia Woodland TEC including hydrology, nutrients or soil resources.

The CEMP and ASSDMP will include measures to manage ASS, dewatering, stormwater, pollution, sedimentation and dust. It is noted that dewatering (if required) will be localised and temporary, to facilitate construction of the duck and dive portion of the Proposal and is not expected to significantly affect TEC patches in the vicinity. The CEMP and proposed drainage infrastructure (including vegetated basins) will avoid and minimise mobilisation of fertilisers, herbicides or other chemicals or pollutants from the DE into the TEC. This includes use of stormwater drainage and treatment involving biofiltration areas and infiltration basins designed in accordance with the Western Australian Better Urban Water Management framework and Stormwater Management Manual (WAPC 2008). No stormwater runoff generated within the DE will be discharged into TEC patches.

Cause substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting:

The Proposed Action is not expected to cause substantial change in species composition or cause a decline or loss of functionally important species. Given the small scale of the proposed clearing footprint (2.61 ha), and the location of the clearing area at the edge of the larger contiguous TEC patch, the Proposal will not result in an action that may cause a substantial change in the species composition of the occurrence of the TEC.

Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to, assisting invasive species that are harmful to the listed ecological community to become established, or causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community:

The Proposed Action is not expected to result in a substantial reduction in the quality or integrity of Banksia Woodland TEC. The Proposed Action will incorporate design and construction measures that will minimise spread of weeds and dieback. This is due to construction management including weed treatment and hygiene, and revegetation with native species on local harvested topsoil with restricted use of fertiliser. The CEMP and proposed drainage infrastructure (including vegetated basins) will avoid and minimise mobilisation of fertilisers, herbicides or other chemicals or pollutants from the DE into the TEC. This includes use of stormwater drainage and treatment involving biofiltration areas and infiltration basins designed in accordance with Western Australian Better Urban Water Management framework and Stormwater Management Manual (WAPC 2008). No stormwater runoff generated within the DE will be discharged into TEC patches.

Section 6 – Environmental record of the person proposing to take the action

Provide details of any proceedings under Commonwealth, State or Territory law against the person proposing to take the action that pertain to the protection of the environment or the conservation and sustainable use of natural resources.

6.1 Does the person taking the action have a satisfactory record of responsible environmental management? Please explain in further detail.

Main Roads is a State Government agency with an assured record of responsible environmental management and performance.

Main Roads has a strong environmental compliance record, with Main Roads remaining in compliance with all conditions of environmental approvals granted under the Environment Protection and Biodiversity Conservation Act 1999 (C'th) and the Environmental Protection Act 1986 (WA).

Main Roads' operations are undertaken in accordance with an Environmental Policy, which outlines Main Roads' overarching objectives for environmental protection, sustainability and continual improvement in environmental performance.

The Environmental Policy is implemented through Main Roads' international standard AS/NZS ISO 14001:2015-certified Environmental Management System (EMS). Main Roads' EMS provides a formalised systematic approach to environmental management for all aspects of the operations (road planning, construction and maintenance).

6.2 Provide details of any past or present proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against either (a) the person proposing to take the action or, (b) if a permit has been applied for in relation to the action – the person making the application.

Main Roads is not subject to any past or present proceedings under Commonwealth or State law for protection of the environment or conservation and sustainable use of natural resources.

6.3 If it is a corporation undertaking the action will the action be taken in accordance with the corporation's environmental policy and framework?

Yes

6.3.1 If the person taking the action is a corporation, please provide details of the corporation's environmental policy and planning framework.

Main Roads will undertake the Proposal in accordance with their Environmental Policy and EMS.

Main Roads' EMS is independently certified and covers all of their processes and activities that have the potential to impact on the environment. The EMS ensures compliance with Main Roads' environment and heritage compliance obligations, providing the framework for driving environmental requirements throughout leadership, planning, support, operation, performance evaluation and improvement actions. The Proposal, therefore, will be undertaken, monitored and measured in accordance with the Main Roads EMS. Main Roads Environmental Policy commits to protecting and enhancing the natural environmental and social values in all Main Roads activities.

Main Roads Environment Policy and EMS certificate is publicly accessible from: https://www.mainroads.wa.gov.au/OurRoads/Environment/Pages/environmentalmanagement.aspx.

6.4 Has the person taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?

Yes

6.4.1 EPBC Act No and/or Name of Proposal.

Main Roads has referred numerous projects under the Environment Protection and Biodiversity Conservation Act 1999 (C'th). A list of recent Projects (2016-2019) referred to DEE is provided below:

EPBC 2019/8471: Bunbury Outer Ring Road Northern and Central Section Project (decision pending)

EPBC 2018/8367: Mitchell Freeway Extension and Wanneroo Road Upgrade (decision pending)

EPBC 2018/8346: Indian Ocean Drive Widening, Gingin Shire (Not a Controlled Action)

EPBC 2018/8316: Roe Highway and Kalamunda Road Interchange Upgrade (Controlled Action)

EPBC 2018/8315: High Street Upgrade, Fremantle (Not a Controlled Action)

EPBC 2018/8284: Armadale Road to North Lake Road Bridge Development, Jandakot (Not a Controlled Action)

EPBC 2018/8279: South Coast Highway Road Widening SLK 14.1 to 18.3, Albany (Not a Controlled Action)

EPBC 2018/8238: Northam Cranbrook Road Widening, Katanning (Not a Controlled Action)

EPBC 2017/8110: Wanneroo Road / Ocean Reef Road Grade Separation, Pearsall (Not a Controlled Action)

EPBC 2017/8035: Great Northern Highway-Bindoon Bypass (Controlled Action)

EPBC 2017/8015: Upgrading Pinjarra Williams Road (M053) 24 -40 SLK (Not a Controlled Action)

EPBC 2017/8009: South Coast Highway Widening 8.2-14.16 SLK, Albany (Not a Controlled Action)

EPBC 2017/7972: Armadale Road Duplication - Tapper to Anstey Road (Not a Controlled Action)

EPBC 2017/7934: Road widening Kojonup South SLK 254.9 to SLK 266 (Controlled Action)

EPBC 2017/7907: Albany Highway Crossman Intersection Improvements (Not a Controlled Action)

EPBC 2017/7884: Indian Ocean Drive Passing Lanes and Widening Works, 52-258 SLK (Not a Controlled Action)

EPBC 2017/7864: Brand Highway Widening and Passing Lanes Project 34.83-164.3 SLK (Controlled Action)

EPBC 2016/7811: South Western Highway Upgrade, Padbury Hill Stage 2 SLK 219.45-221.00, Balingup (Not a Controlled Action)

EPBC 2016/7777: South Coast Highway Cheynes East Intersection Upgrade and Realignment (Not a Controlled Action)

EPBC 2016/7762: Upgrade a section of Albany Highway, Harold Road passing lane (Not a Controlled Action)

EPBC 2016/7761: Great Northern Highway Muchea to Wubin Upgrade Stage 2, Walebing to Wubin (Controlled Action)

EPBC 2016/7757: Bowelling curves realignment- Collie Lake King Road 64.76-69.84 SLK (Controlled Action)

EPBC 2016/7743: Arthur River Road Upgrade (Not a Controlled Action)

EPBC 2016/7740: Brand Highway road formation and seal widening 51.2-77.5 SLK (Not a Controlled Action)

EPBC 2016/7732: Ellenbrook Bus Rapid Transit Project (Not a Controlled Action)

EPBC 2016/7714: Northam to Cranbrook Road Widening 325.9 - 347.4 SLK (Controlled Action)

EPBC 2016/7698: Maintenance Zone Establishment - Toodyay Goomalling Road, Williams Narrogin Highway and Pinjarra Williams Road, Wheatbelt Region (Controlled Action)

EPBC 2016/7665: Toodyay Road Widening and Upgrade Project (Controlled Action)

EPBC 2016/7664: Narrogin Link Road Stage 3 - North Extension (Not a Controlled Action)

EPBC 2016/7656: Great Northern Highway Muchea to Wubin Upgrade Stage 2 - Muchea North (Controlled Action)

Section 7 – Information sources

You are required to provide the references used in preparing the referral including the reliability of the source.

7.1 List references used in preparing the referral (please provide the reference source reliability and any uncertainties of source).

Reference Source	Reliability	Uncertainties
AECOM. 2014a. Tonkin Highway and Hale Road: Preliminary Environmental Impact Assessment. 17 October 2014. Prepared for Main Roads Western Australia.	Reliable	None
AECOM. 2014b. Tonkin Hwy and Welshpool Road East: Preliminary Environmental Impact Assessment. 17 October 2014. Prepared for Main Roads Western Australia.	Reliable	None
AECOM. 2015. Tonkin Highway/Hale Road, Tonkin Highway/Welshpool Road and Tonkin Highway/Kelvin Road: Biological Assessment. 9 December 2015. Prepared for Main Roads Western Australia.	Reliable	None
Beard, J. S. 1990. Plant life of Western Australia. Kangaroo Press, Perth.	Reliable	None
Bureau of Rural Science. 1991. Digital Atlas of Australian Soils. GIS data layer	Reliable	None
Department of Environment and Conservation (DEC). 2009. Wavy-leaved smokebush (Conospermum undulatum) Recovery Plan. Commonwealth Department of the Environment, Water, Heritage and the Arts, Canberra.	Reliable	None
Department of the Environment (DoE). 2013. Matters of National Environmental Significance Significant impact	Reliable	None

Reference Source	Reliability	Uncertainties
guidelines 1.1 – Environment Protection and Biodiversity Conservation Act 1999. Commonwealth of Australia.		
Department of Sustainability, Environment, Water, Population and Communities (DSEWPC). 2011. Map 1: Modelled distribution of Baudin's black cockatoo (Calyptorhynchus baudinii). Available at: http://www.environment.gov.au/system/files/resources/895d4094-af63-4dd3-8dff-ad2b9b943312/files/referral-guidelines-wa-black-cockatoo-map-1.pdf.	Reliable	None
Environmental Protection Authority (EPA). 2000. Environmental Protection of Native Vegetation in Western Australia: Clearing of Native Vegetation, with particular reference to the Agricultural Area. Position Statement No. 2. December 2000.	Reliable	None
Geological Survey of Western Australia and Geoscience Australia. 2008. Surface Geology of Australia 1:1,000,000 Western Australia. GIS data layer.	Reliable	None
Government of Western Australia (GoWA). 2018. 2017 South West Vegetation Complex Statistics. Current as of October 2017. WA Department of Biodiversity, Conservation and Attractions, Perth. https://catalogue.data.wa.gov.au/dataset/dbca.	Reliable	None
Heddle, E. M., O. W. Loneragan and J. J. Havel. 1980. Vegetation complexes of the Darling System in: Atlas of Natural Resources: Darling System, Western Australia. Department of Conservation and Environment, Perth.	Reliable	None

Reference Source	Reliability	Uncertainties
Johnstone, R. E., Kirkby, T., and Sarti, K. 2013. The breeding biology of the Forest Red-tailed Black Cockatoo Calyptorhynchus banksii naso Gould in south-western Australia. I. Characteristics of nest trees and nest hollows'. Pacific Conservation Biology 19, 121-142.	Reliable	None
Keighery B. J. 1994. Bushland Plant Survey - A Guide to Plant Community Survey for the Community Nedlands, Western Australia, Wildflower Society of WA (Inc).	Reliable	None
Perth Airport. 2018. New Runway Project Volume B: Environment, Heritage and Traffic Assessment.	Reliable	None
Strategen Environmental (Strategen). 2019. Tonkin Highway Welshpool Road to Hale Road – Vegetation condition assessment. Memorandum prepared for Main Roads, June 2019.	Reliable	None
Western Australian Planning Commission (WAPC). 2008. Better Urban Water Management. State of Western Australia. Available at: http://www.water.wa.gov.au/__data/assets/pdf_file/0003/1668/82305.pdf	Reliable	None

Section 8 – Proposed alternatives

You are required to complete this section if you have any feasible alternatives to taking the proposed action (including not taking the action) that were considered but not proposed.

8.1 Select the relevant alternatives related to your proposed action.

8.27 Do you have another alternative?

Section 9 – Contacts, signatures and declarations

Where applicable, you must provide the contact details of each of the following entities: Person Proposing the Action; Proposed Designated Proponent and; Person Preparing the Referral. You will also be required to provide signed declarations from each of the identified entities.

9.0 Is the person proposing to take the action an Organisation or an Individual?

Organisation

9.2 Organisation

9.2.1 Job Title

Project Director

9.2.2 First Name

Gary

9.2.3 Last Name

Manning

9.2.4 E-mail

gary.manning@mainroads.wa.gov.au

9.2.5 Postal Address

PO Box 6202
East Perth WA 6892
Australia

9.2.6 ABN/ACN

ABN

50860676021 - MAIN ROADS

9.2.7 Organisation Telephone

(08) 9158 4318

9.2.8 Organisation E-mail

gary.manning@mainroads.wa.gov.au

9.2.9 I qualify for exemption from fees under section 520(4C)(e)(v) of the EPBC Act because I am:

Not applicable

Small Business Declaration

I have read the Department of the Environment and Energy's guidance in the online form concerning the definition of a small a business entity and confirm that I qualify for a small business exemption.

Signature:..... Date: .....

9.2.9.2 I would like to apply for a waiver of full or partial fees under Schedule 1, 5.21A of the EPBC Regulations

No

9.2.9.3 Under sub regulation 5.21A(5), you must include information about the applicant (if not you) the grounds on which the waiver is sought and the reasons why it should be made

Person proposing the action - Declaration

I, GARY MANNING, declare that to the best of my knowledge the information I have given on, or attached to the EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence. I declare that I am not taking the action on behalf of or for the benefit of any other person or entity.

Signature:..... Date: 6/9/19

I, GARY MANNING, the person proposing the action, consent to the designation of MAIN ROADS WA as the proponent of the purposes of the action describe in this EPBC Act Referral.

Signature:..... Date: 6/9/19

9.3 Is the Proposed Designated Proponent an Organisation or Individual?

Organisation

9.5 Organisation

9.5.1 Job Title

Project Director

9.5.2 First Name

Gary

9.5.3 Last Name

Manning

9.5.4 E-mail

gary.manning@mainroads.wa.gov.au

9.5.5 Postal Address

PO Box 6202
East Perth WA 6892
Australia

9.5.6 ABN/ACN

ABN

50860676021 - MAIN ROADS

9.5.7 Organisation Telephone

(08) 9158 4318

9.5.8 Organisation E-mail

gary.manning@mainroads.wa.gov.au

Proposed designated proponent - Declaration

I, GARY MANNING, the proposed designated proponent, consent to the designation of myself as the proponent for the purposes of the action described in this EPBC Act Referral.

Signature: ..... Date: 6/9/19

9.6 Is the Referring Party an Organisation or Individual?

Organisation

9.8 Organisation

9.8.1 Job Title

WA State Manager

9.8.2 First Name

Tim

9.8.3 Last Name

Bowra

9.8.4 E-mail

tbowra@strategen.com.au

9.8.5 Postal Address

PO Box 243
Subiaco WA 6008
Australia

9.8.6 ABN/ACN

ABN

62100220479 - JBS&G AUSTRALIA PTY LTD

9.8.7 Organisation Telephone

08 9380 3100

9.8.8 Organisation E-mail

adminwa@jbsg.com.au

Referring Party - Declaration

I, _____, I declare that to the best of my knowledge the information I have given on, or attached to this EPBC Act Referral is complete, current and correct. I understand that giving false or misleading information is a serious offence.

Signature:…… Date: ……

Appendix A - Attachments

The following attachments have been supplied with this EPBC Act Referral:

1. Appendix 1 - Various Lots within DE.pdf
2. Figure 1 Site location.pdf
3. Figure 2 Threatened and Priority Ecological Communities and Flora.pdf
4. Figure 3 Fauna Habitat.pdf
5. Figure 4 Black Cockatoo Habitat.pdf
6. Figure 5 Wetlands.pdf
7. Figure 6 Vegetation Types.pdf
8. Figure 7 Vegetation Condition.pdf
9. Figure 8 Regional Context.pdf
10. Protected Matters Search Tool.pdf
11. Tonkin Hwy & Hale Road Preliminary Environmental Impact Assessment.PDF
12. Tonkin Hwy & Welshpool Rd Preliminary Environmental Impact Assessment.pdf
13. Tonkin Hwy Interchanges (Hale, W-pool, Kelvin Rds) Biologic Assessment.PDF
14. Vegetation condition Assessment.pdf