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WESTERN AUSTRALIA

Clearing Desktop Report – CPS 818

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NWCH Parking Bay Upgrades 1121 and 1102 SLK
North West Coastal Highway H07 (1121 and 1102 SLK)
Pilbara
EOS # 2880

Contents

1	PROPOSAL	5
1.1	Purpose and Justification.....	5
1.1.1	Main Roads Approach to Road Safety and the Environment	5
1.2	Proposal Scope.....	6
1.3	Proposal Location	6
1.4	Clearing Details.....	6
1.5	Alternatives to Native Vegetation Clearing Considered During Proposal Development.....	10
1.6	Measures to Avoid, Minimise, Reduce and Manage Proposal Clearing Impacts	10
1.7	Approved Policies and Planning Instruments	12
2	SCOPE AND METHODOLOGY OF CLEARING DESKTOP ASSESSMENT.....	13
2.1	Report Terminology and Sources.....	13
2.2	Desktop Assessment	13
2.3	Surveys and Assessments	13
3	VEGETATION DETAILS	15
3.1	Proposal Site Vegetation Description	15
4	ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES	15
5	COMPLIANCE WITH CPS 818.....	28
6	REFERENCES	30
7	APPENDICES	32
	Table 1: Clearing PEMR.....	32
	Table 3: Erosion and Sedimentation Control PEMR	33
	Table 4: Fauna Management PEMR.....	34
	Table 5: Machinery and Vehicle Management PEMR	35
	Table 6: Mulch and Topsoil Management PEMR.....	36
	Table 7: Pegging and Flagging PEMR.....	37
	Table 8: Water Drainage Management PEMR	38
	Table 9: Weed Management PEMR	39

List of Figures

Figure 1: Development Envelope of 1102 SLK (LHS and RHS)	7
Figure 2: Development Envelope of 1121 SLK (LHS and RHS)	8
Figure 3: Study Area 40km.....	9

List of Tables

Table 1. Measures Undertaken to Avoid, Minimise, Reduce and Manage the Proposal Clearing Impacts11

Table 2. Pre-European Vegetation Representation15

Table 3. Summary of Additional Management Actions Required by CPS 818.....28

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1 PROPOSAL

1.1 Purpose and Justification

The Proposal aims to improve road safety at four parking bays located on both sides of the North West Coastal Highway at 1102 and 1121 SLK respectively (LHS and RHS). The improvements aim to allow RAV10 vehicles, improve amenity when accessing parking via the reduction of dust, resolve drainage issues, and provide a long-term reduction in maintenance cost.

The proposed works are predominantly reinstating existing infrastructure including sealing the existing parking bay and reinstating existing drainage structures.

The only “new” clearing proposed is a drain following the parking bay around the back edge which is required to divert water away from the infrastructure to maintain the longevity of the seal, structural integrity and reduce water pooling on the parking bay for safety reasons.

1.1.1 Main Roads Approach to Road Safety and the Environment

Main Roads is committed to minimising the environmental impacts of all of its activities and manages the State road network to achieve balanced economic, social, safety and environmental benefits for the community. Main Roads recognises that Western Australia’s environment is significant from a global perspective and the unique conservation values that are contained within its road reserve. The Main Roads road network often adjoins natural areas and, in some locations, the reserve itself hosts remnant vegetation with high environmental values. Although the reserves were not established for this purpose, Main Roads recognises that it has a responsibility to conserve the environmental values that occur within the State’s road network and minimise the impact its proposals have on the environment. In addition to providing a safe and efficient road network for all people using the roads under its control, Main Roads is also committed to protecting and enhancing the natural environment.

In accordance with National and State Government road safety policies, Main Roads is also committed to substantially reducing road trauma on the road network through Safe System principles. The Safe System approach acknowledges that more than two thirds of all serious crashes are due to human error rather than deliberate risk taking (e.g. speeding or drink driving) and seeks to improve behaviour through education and enforcement while managing the safety of vehicles, speeds and the road and road infrastructure. It is shown that improving sub-optimal road formation will substantially reduce the likelihood and severity of road crashes. For example, according to the Road Safety Management Guideline, increasing the sealed shoulder from 0.5 m to 2 m will reduce Killed and Seriously Injured numbers by more than 50%.

As the statutory authority responsible for providing and managing a safe and efficient main road network in Western Australia, Main Roads focuses on improving road safety by thoroughly considering all environmental, economic and community benefits and impacts. It operates on a hierarchy of avoiding, minimising, reducing and then, if required, offsetting our environmental impacts. This has been achieved through changes in proposal scope and design. Main Roads regularly reduces its clearing footprint by restricting earthworks limits for proposals, steepening batters, installing barriers, establishing borrow pits in cleared paddocks and avoiding temporary clearing for storage, stockpiles and turn around bays to avoid and minimise its impacts.

Further details on measures to avoid, minimise and reduce are provided in Section 1.5.

1.2 Proposal Scope

The proposed works are predominantly reinstating existing infrastructure and sealing the existing parking bays. The only new infrastructure/clearing required comprises a bordering drain around the edge of the parking bays which is required to move the water away from the infrastructure to maintain structural integrity. Proposed activities include:

- Installation of survey pegs.
- Minor vegetation clearing whilst preparing for the sub-grade and drainage works.
- Import 150 mm of Crushed Road Base, compact and trim to design level.
- Drainage Works
- Sealing of the parking bays

1.3 Proposal Location

The Development Envelope is located on North West Coastal Highway at 1102 (Left and Right hand side) and 1121 SLK (Left and Right hand side) respectively, within the city of Karratha as shown in Figure 1 – 3.

1.4 Clearing Details

Proposed Clearing to be undertaken using CPS 818:

1ha

Areas of Native Vegetation Clearing:

Total of 1ha of native vegetation to be cleared from a 9.68 ha Development Envelope. Development Envelopes are displayed in Figure 1 and Figure 2.

Type of Native Vegetation:

Native vegetation proposed to be cleared is described by Beard (1979) as: Vegetation Association 589 - Short bunch-grass savanna / Grass-steppe. This vegetation association has 99% remaining from a pre-European state and is not considered remanent vegetation.



Figure 1: Development Envelope of 1102 SLK (LHS and RHS)

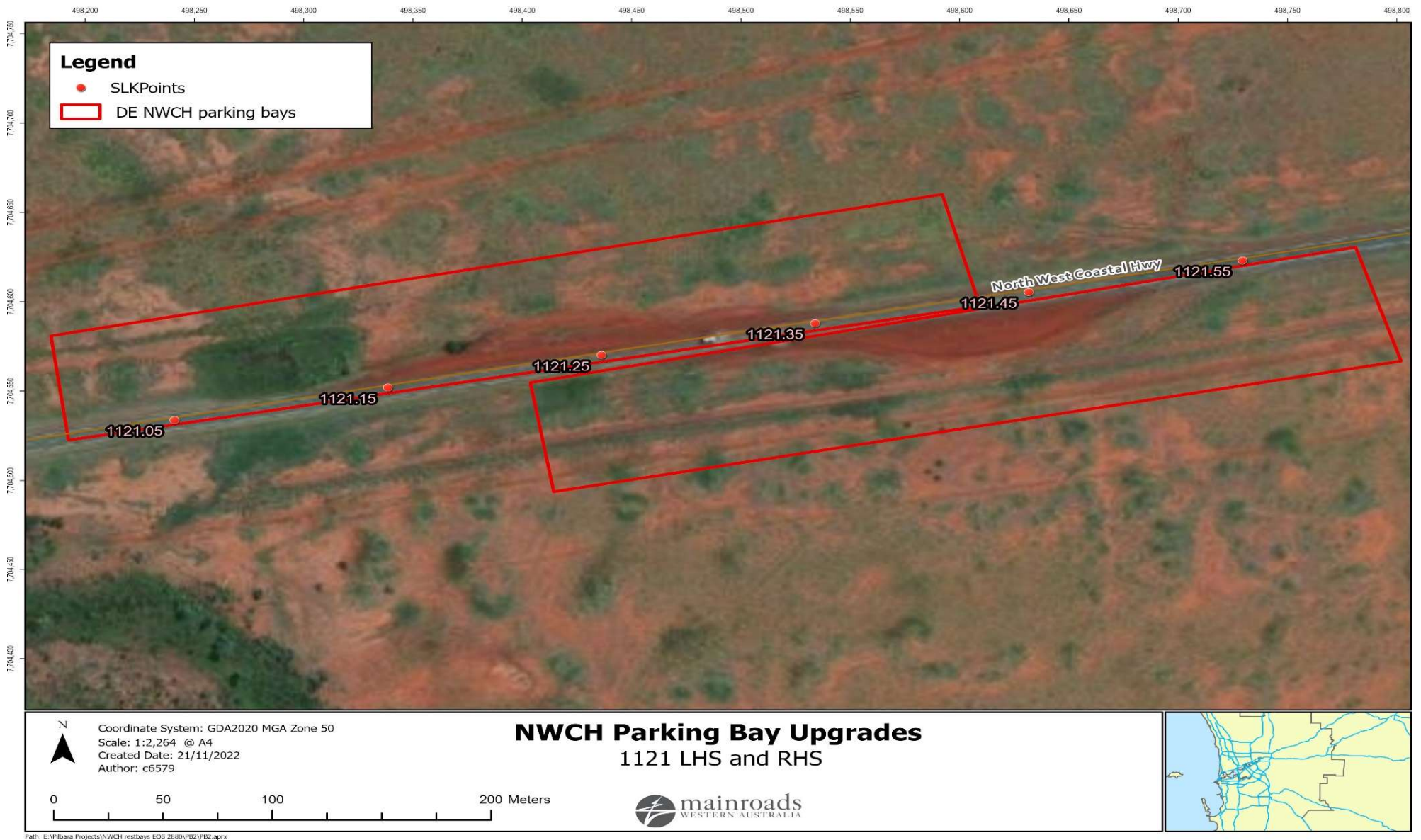


Figure 2: Development Envelope of 1121 SLK (LHS and RHS)

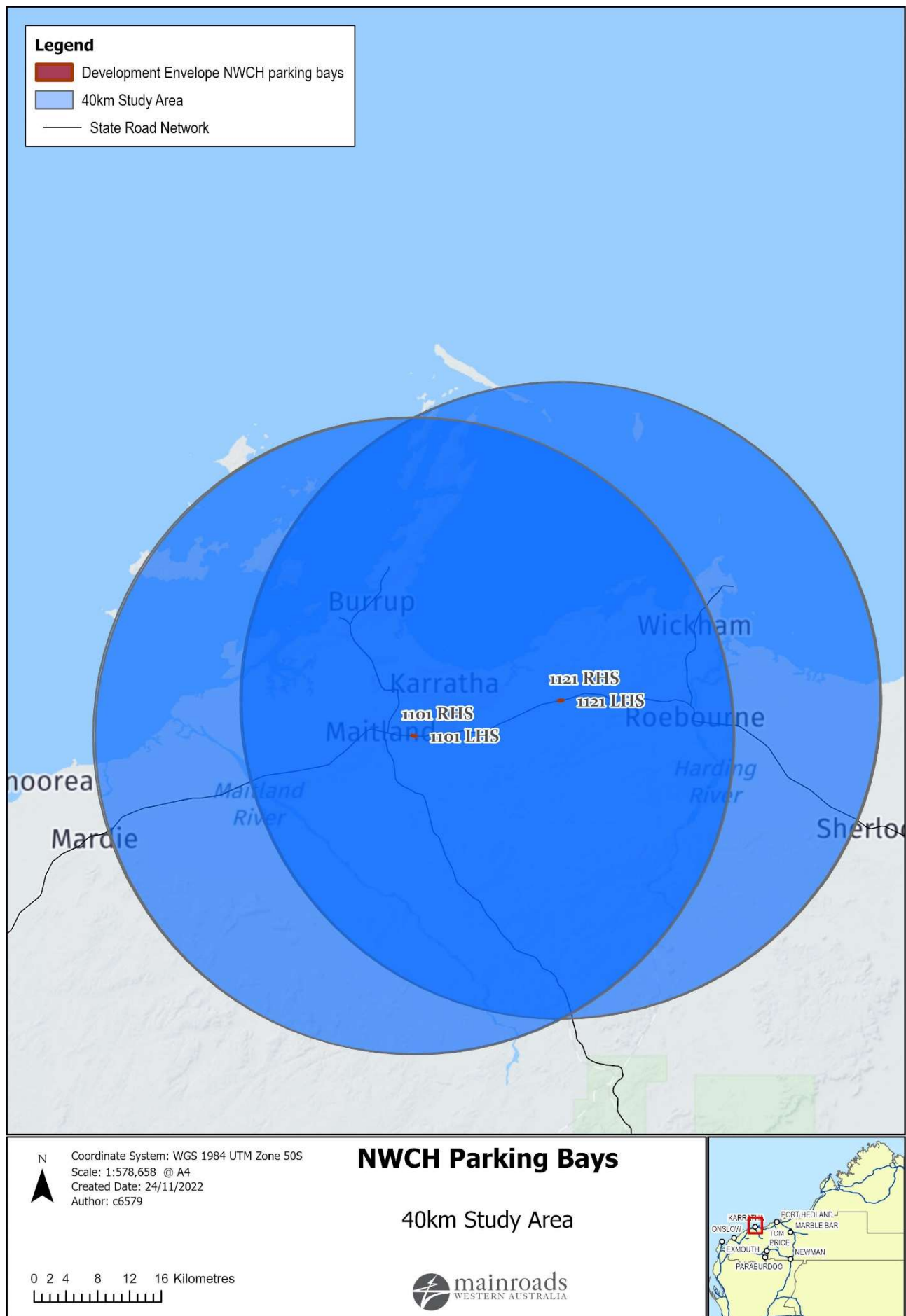


Figure 3: Study Area 40km

1.5 Alternatives to Native Vegetation Clearing Considered During Proposal Development

The following alternatives to clearing were considered during the development of the proposal:

- Do not upgrade the rest bay and reinstate the drainage, however, this will result in further degradation of the rest area which may cause road users to utilise alternate areas to pullover this then creates safety risks in addition to unauthorised clearing.

1.6 Measures to Avoid, Minimise, Reduce and Manage Proposal Clearing Impacts

The design and management measures implemented to avoid and minimise the potential clearing impacts of the Proposal are provided in Table 1.

New clearing has been minimised by utilising existing cleared and disturbed areas. The proposed works are predominantly reinstating existing infrastructure and sealing the existing parking bay the only new infrastructure/clearing is a drain around the outer edge of the parking bays this is required to move the water away from the infrastructure to maintain the structural integrity. Subsequently, few other options for impact minimisation are available for the Proposal.

Table 1. Measures Undertaken to Avoid, Minimise, Reduce and Manage the Proposal Clearing Impacts

Design or Management Measure	Discussion and Justification
Alignment to one side of existing road	The rest bays are already existing and alignment to one side of the existing road is not possible. Clearing has been kept to a minimum and previously disturbed areas utilised.
Alternative alignment located within pasture or degraded areas	Degraded and previously disturbed areas (e.g. areas where vehicles have previously traversed) have been utilised for this work.
Use of existing cleared areas for access tracks, construction storage and stockpiling	No temporary clearing will be required for access and storage of construction materials.
Drainage modification	Reinstating existing drainage to ensure water moves away from the structures (Road and Rest area) to maintain structural integrity and improve safety.

1.7 Approved Policies and Planning Instruments

The clearing of native vegetation in Western Australia is regulated under the EP Act and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the *Environmental Protection Act 1986* (EP Act), Main Roads has also had regard to the below instruments where relevant.

Other Legislation potentially relevant for assessment of clearing and planning/other matters:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Country Areas Water Supply Act 1947* (WA) (CAWS Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Planning and Development Act 2005* (WA) (P&D Act)
- *Soil and Land Conservation Act 1945* (WA)
- *Rights in Water and Irrigation Act 1914*
- *Aboriginal Heritage Act 1972* (WA).

Other relevant policies and guidance documents:

- Environmental Offsets Policy (Government of Western Australia, 2011)
- A guide to the assessment of applications to clear native vegetation (Government of WA, December 2014)
- Procedure: Native vegetation clearing permits (Government of WA, October 2019)
- Environmental Offsets Guidelines (Government of Western Australia, 2014)
- Technical guidance – Flora and Vegetation Surveys for Environmental Impact Assessment (EPA, 2016)
- Technical guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment (EPA, 2020)
- Approved conservation advice under section 266B of the EPBC Act for threatened flora/fauna/vegetation communities.

2 SCOPE AND METHODOLOGY OF CLEARING DESKTOP ASSESSMENT

Native vegetation will be cleared to accommodate this Proposal. This clearing will be undertaken using the Main Roads Statewide Clearing Permit CPS 818.

To comply with CPS 818, Main Roads must prepare a Clearing Desktop Report (CDR).

The CDR outlines the key activities associated with the Proposal, the existing environment and an assessment of native vegetation clearing. This assessment provides an evaluation of the vegetation clearing impacts associated with the Proposal using the ten Clearing Principles listed under s51 of the EP Act and strategies used to manage vegetation clearing.

2.1 Report Terminology and Sources

The following terms are used in this Clearing Report

- **Native Vegetation Clearing Area (Clearing Area)** – The maximum amount of native vegetation to be cleared for the Proposal that will accommodate the designed earthworks and, typically, a nominal buffer to allow for the safe movement of machinery during construction.
 - **1ha for this Proposal**
- **Development Envelope (DE)**– The maximum extent within which the Clearing Area will be located. The DE is larger than the Clearing Area to allow for minor changes to the Proposal footprint as the design process continues, and to account for minor and unexpected changes that may occur during construction, such as working to avoid a large tree or encountering buried boulders or services. This flexibility allows the site personnel to make modifications to the Proposal to avoid areas that may contain better environmental values. The CDR has assessed all environmental values within the DE as though all of these values will be impacted, up to the amount specified within the Clearing Area.
 - **Figures 1 and 2 display the location of the DE**
- **Study Area** – Area covered by the Desktop Assessment. The Study Area for the Proposal is confined to a local area of a 40km radius.
 - **Figure 3 Displays the Study Area**

2.2 Desktop Assessment

A desktop assessment of the DE was undertaken by viewing internal datasets and other government agency managed databases, and consulting with relevant stakeholders where necessary.

GIS layer viewing and mapping is done using ArcMap and/or Main Roads' corporate mapping system known as iMaps. Referencing of the GIS layers accessed is done under the relevant methodology section of each clearing principle. Government managed databases that were searched to locate additional information, which are listed in Section 9 – References.

2.3 Surveys and Assessments

The following assessments were undertaken to inform this CDR:

- Desktop GIS assessment
- Site Photo Analysis

- Likelihood of Occurrence assessment

3 VEGETATION DETAILS

3.1 Proposal Site Vegetation Description

Table 2 provides details of the vegetation type within the Proposal and the remaining extents of this association.

Table 2. Pre-European Vegetation Representation

Pre-European Vegetation Association	Scale	Pre-European Extent (ha)	Current Extent (ha)	% Remaining	% Current Extent in DBCA Managed Land (proportion of pre-European Extent)
Veg Assoc No. 589	Statewide	807,698.58	802,713.40	99.38	1.89
	IBRA Bioregion Pilbara	728,768.20	724,695.82	99.44	2.1
	IBRA Sub-region Roebourne	675,391.80	671,327.48	99.40	2.13
	Local Government Authority City of Karratha	312,813.64	310,512.32	99.26	0.78

4 ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

In assessing whether the proposal's clearing is likely to have a significant impact on the environment, the Proposal was assessed against the ten Clearing Principles (EP Act, Schedule 5).

Each Principle has been assessed in accordance with the former Department of Environment Regulation (now Department of Water and Environmental Regulation (DWER) '[A Guide to the Assessment of Applications to Clear Native Vegetation](#)' (Department of Environment Regulation, 2014) and other relevant clearing permit application decision reports prepared by DWER.

The proposed clearing is not likely to be at variance with the ten Clearing Principles.

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

Proposed clearing is not likely to be at variance to this Principle.

Assessment

The DE comprises of four rest bays located at 1121 and 1102 SLK with one bay on each side of the road per SLK (RHS and LHS), there is approximately 20 km between the two groups. The DE is mapped as vegetation association 589 which is described as "*Short bunch-grass savanna / Grass-steppe*". This vegetation association is not classed as remanent vegetation and has 99% remaining from a pre-European state.

Rest Area 1102 SLK (left and right hand side) is located within the mapped spatial boundary of the Roebourne Plains gilgai grasslands PEC – This community is described by Department of Biodiversity, Conservation and Attractions (DBCA) as '*These grasslands occur on microrelief on strongly gilgaied self-mulching cracking clays, and emergent depositional surfaces. The grasslands are surrounded by clay plains/flats and sandy coastal and alluvial plains*' (DBCA 2022).

The gilgai depressions of the Roebourne Plains gilgai grasslands PEC supports ephemeral and perennial tussock grasslands dominated by *Sorghum* sp. and *Eragrostis xerophila* (Roebourne Plains grass) along with other native species including *Astrela pectinata* (barley mitchell grass), *Eriachne benthamii* (swamp wanderie grass), *Chrysopogon fallax* (golden beard grass) and *Panicum decompositum* (native millet) which create very distinct circular patterns. This vegetation patterning is not present within the vegetation of the DE which would suggest that the vegetation does not represent this PEC. Furthermore, as evident from the images of the DE, vegetation within 1102 SLK (LHS) is dominated by hummock grassland (*Triodia* sp.) and therefore not representative of the tussock grasslands PEC, and the highly disturbed 1102 (RHS) parking bay appears to be dominated by introduced *Cenchrus* sp. (Buffelgrass). The DE is also adjacent to existing infrastructure and highly disturbed due to impacts from vehicles that have driven off road with introduced species incursion. Based on the above, it is unlikely that the Clearing Area represents the Roebourne Plains gilgai grasslands PEC.

A search of DBCA records revealed no Priority or Threatened flora have been previously recorded within the DE. A likelihood of occurrence assessment of Priority flora within the 40km Study Area was also conducted to determine if any Priority species may occur within the DE. Results of this assessment concluded that 21 Priority species have been previously recorded within the Study Area with no species likely to occur within the DE.

Several significant fauna species have been recorded within the study area, these will be discussed further in Principle B, however, due to the close proximity to busy lineal infrastructure, the minor nature of the works, the abundance of high quality vegetated habitat through adjacent areas and taking into consideration this project is predominantly reinstating or extending existing infrastructure, it's unlikely that the proposed clearing will have significant detrimental impact on native fauna diversity.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology

- BoM Website (Accessed 23/11/22)
- DCCEEW Protected Matters Search Tool Report
- Department of Natural Resources and Environment (2002)
- Government GIS Shapefiles:
 - DBCA Threatened and Priority Ecological Community database search (Accessed 23/11/22)
 - DBCA Threatened and Priority flora database search (Accessed 23/11/22)
- Flora Base (Accessed 23/11/22)
- Statewide Vegetation Statistics (Government of Western Australia 2018)

(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.

Proposed clearing is not likely to be at variance to this Principle.

Assessment

A desktop assessment found 69 listed significant species of fauna occurring within the 40km Study Area.

Due to the proximity of the DE to the ocean, 10 of these species are marine and will not be discussed further as the Proposal will not impact ocean or marine systems. The remaining species include 47 avian species, eight mammals and four reptiles.

A likelihood of occurrence assessment was conducted on all significant species identified within the 40km Study Area. The 47 Avian species recorded within the Study Area may be occasional visitors to the DE due to their mobile and transient nature, however, due to the locally small scale of the DE, proximity to busy infrastructure and lack of large trees it is unlikely that the DE would provide preferable habitat for these species. Furthermore, the project area is surrounded by extensive habitat and vegetation of a higher quality.

Of the remaining eight mammals and four reptiles, the likelihood of occurrence assessment only identified two reptiles (the Four-lined slider (Karratha) and Lined soil-crevice skink (Dampier)) as 'maybe' occurring within the DE. Little is known about these species preferred habitat and distribution with a few historical records found within the Study Area, however, not in close proximity to the DE. Due to the degraded nature of the vegetation within the proposed Clearing Area it is unlikely that this would be preferential or critical habitat for these species. Furthermore, expansive areas of habitat in better condition occurs directly adjacent to the DE and the relatively small clearing area (1ha) is unlikely to significantly impact on habitat which may be utilised by these species.

All other species within the Study Areas were found to be unlikely or would not occur within the DE.

The proposed works are predominantly reinstating existing drainage structures, and vegetation proposed to be cleared is largely either regrowth or degraded vegetation edging existing busy infrastructure. The proposed vegetation clearing will not fracture critical fauna corridors or isolate any denning habitat.

Taking into consideration the above factors it is unlikely the proposed clearing would be at variance to this principle.

Methodology

- DCCEEW Protected Matters Search Tool Report
- Government GIS Shapefiles:
 - DBCA Threatened and Priority fauna database search (Accessed 23/11/2022)
- Species specific conservation listing advice and recovery plans

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

Proposal is not likely to be at variance to this Principle.

Assessment

There are no known records of Threatened flora within the DE or Study Area(GIS Database).

The vegetation association within the DE is common and widespread within the region (GIS Database), and the vegetation proposed to be cleared is unlikely to be necessary for the continued existence of any species of Threatened flora.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology

- Florabase (Accessed 23/11/2022)
- Government GIS shapefiles:
 - DBCA Threatened flora database search (Accessed 23/11/2022)

(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.

Proposed clearing is not likely to be at variance to this Principle.

Assessment

There are no known Threatened Ecological Communities (TECs) located within or in close proximity to the DE or within the 40km Study Area (GIS Database).

As the vegetation located within the DE is common, regionally abundant and does not represent descriptions of known Pilbara TECs. Furthermore, the vegetation proposed to be cleared is predominantly comprised of regrowth and is therefore unlikely to represent a TEC.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology

- Community specific conservation listing advice and recovery plans
- Government GIS shapefiles:
 - DBCA Threatened Ecological Community database search (Accessed 23/11/2022)

(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.

Proposed clearing is not likely to be at variance to this Principle.

Assessment

Pre-European Vegetation Association	Scale	Pre-European Extent (ha)	Current Extent (ha)	% Remaining	% Current Extent in DBCA Managed Land (proportion of pre-European Extent)
Veg Assoc No. 589	Statewide	807,698.58	802,713.40	99.38	1.89
	IBRA Bioregion Pilbara	728,768.20	724,695.82	99.44	2.1
	IBRA Sub-region Roebourne	675,391.80	671,327.48	99.40	2.13
	Local Government Authority City of Karratha	312,813.64	310,512.32	99.26	0.78

Beard (1979) mapping shows that the DE consists of Beard Vegetation Association 589. The pre-European extent remaining within all of the scales stated in the above table is greater than 99%. Vegetation Association 589 is of least conservation concern at all scales.

Vegetation is widespread and regionally abundant and there are no areas that are considered significant remnant vegetation within the DE.

Considering the small extent of proposed clearing (1 ha) adjacent to an existing linear corridor, and the large extent of similar vegetation available in the broader Pilbara regional context, it is unlikely that the Proposal will result in habitat fragmentation and therefore the proposed clearing is not at variance to this Clearing Principle

Methodology

- Aerial photography
- Government GIS shapefiles:
 - Pre-European vegetation (Accessed 23/11/2022)
- Statewide Vegetation Statistics (Government of Western Australia 23/11/2022)

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

Proposed clearing is not at variance to this Principle.

Assessment

There are no permanent or ephemeral watercourses or wetlands located within the DE or directly adjacent.

Based on the above, the proposed clearing is not at variance to this Principle.

Methodology

- Government GIS shapefiles:
 - Geomorphic Wetlands (Accessed 23/11/2022)
 - Ramsar Wetlands (Accessed 23/11/2022)
 - Important Wetlands (Accessed 23/11/2022)
 - Watercourses (Accessed 23/11/2022)
 - RIWI Act Rivers (Accessed 23/11/2022)

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

Proposed clearing is not likely to be at variance to this Principle.

Assessment

The DE lies within the Horseflat Land System land system (GIS Database). This land system has been mapped and described in technical bulletins produced by the former Department of Agriculture.

The Horseflat land system is described as "*Gilgaied clay plains supporting Roebourne Plains grass grasslands and minor grassy snakewood shrublands.*" This land system is not generally susceptible to erosion with 48% of the land system mapped in Good condition of a total 1,216,100 ha." (Van Vreeswyk et al., 2004)

There will be no dewatering or excavation below the water table so it is unlikely that Acid Sulfate Soils will be an issue in the area. Furthermore, database searches indicate the soil in the DE has an extremely low risk of Acid Sulfate Soils. The minor clearing of vegetation is not considered likely to significantly alter the hydrological balance and cause a change in the salinity in the DE.

The proposed clearing of up to 1 ha of native vegetation, for the purpose of parking bay upgrades is unlikely to cause appreciable land degradation.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology

- Van Vreeswyk et al. (2004)
- Government GIS Shapefiles:
 - Acid Sulphate Soil Risk Map (Accessed 23/11/2022)
 - Soil landscape land quality – Accessed 23/11/2022)

(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.

Proposed clearing is not likely to be at variance to this Principle.

Assessment

There are no DBCA managed estates or other conservation areas in the DE. The nearest DBCA managed land is approximately 16 km to the North of the 1102 SLK DE "Murujuga National Park". Due to the distance from the National Park there will be no direct or indirect impacts to this conservation area from the Proposal.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology

- Biological Survey/Wetland Field Assessment (<insert report date>)
- Government GIS Shapefiles:
 - DBCA Legislated Lands and Waters & Lands of Interest (Accessed <insert latest date>)
 - Geomorphic Wetlands (conservation category wetlands only) (Accessed <insert latest date>)
 - Ramsar Wetlands (Accessed 23/11/2022)
 - Important Wetlands (Accessed 23/11/2022)

(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.

Proposed clearing is not likely to be at variance to this Principle.

Assessment

There are no Public Drinking Water Source Areas (PDWSA) within or in close proximity to the DE, the nearest PDWSA being Harding Dam Catchment Area approximately 28 km south of the DE (GIS Database). There are no watercourses or wetlands within the DE (GIS Database). The proposed works include reinstating existing drainage infrastructure, diverting sheet flow from infrastructure areas and toward ephemeral drainage lines.

The Proposal does involve excavations which will intersect groundwater and the proposed clearing is unlikely to cause deterioration in the quality of underground water.

Based on the above, the proposed clearing is not likely to be at variance to this Principle.

Methodology

- Government GIS Shapefiles:
 - RIWI Act, Surface Water Areas and Irrigation Districts (Accessed 23/11/2022)
 - CAWSA Part 2A Clearing Control Catchments (Accessed 23/11/2022)
 - RIWI Act, Groundwater Areas (Accessed 23/11/2022)
 - Soil landscape land quality - Salinity Risk (Accessed 23/11/2022)
 - Groundwater Salinity Statewide (Accessed 23/11/2022)
 - Soil Mapping (Accessed 23/11/2022)
-

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

Proposed clearing is not likely to be at variance to this Principle.

Assessment

The DE is in a low rainfall area. Average annual rainfall data from the nearest weather station in Karratha is 297.5mm per annum (BOM, 2022). However, the Pilbara region experiences cyclonic rainfall events resulting in sheet flow and drainage of the landscape into ephemeral drainage lines.

There are no permanent water courses or waterbodies within the DE (GIS Database). Seasonal drainage lines are common in the region and temporary localised flooding may occur briefly following heavy rainfall events. However, the proposed clearing is unlikely to increase the incidence or intensity of natural flooding events due to its minor nature and the works predominantly reinstating hydrological features including drains which should help alleviate flooding.

Based on the above, the proposed clearing is not likely to be at variance to this Principle

Methodology

- BoM Website (Accessed 23/11/2022)
- Van Vreeswyk et al. (2004)

5 COMPLIANCE WITH CPS 818

The clearing associated with the proposal is unlikely or not at variance with the Clearing Principles. Additional management actions under CPS 818 are detailed in Table 3.

Table 3. Summary of Additional Management Actions Required by CPS 818

Impact of Clearing	Yes/No or NA	Further Action Required
1. The CDR indicates that the clearing is 'At Variance' or 'May be at Variance' with one or more of the Clearing Principles.	No	No further action required.
2. Clearing is at variance or may be at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality or (j) the incidence of flooding.	No	No further action required.
3. Clearing is at variance with Clearing Principle (g) land degradation, (i) surface or underground water quality and (j) the incidence of flooding.	No	No further action required.
4. The Proposal involves clearing for temporary works (as defined by CPS 818).	No	No further action required.
5a. Proposal is within a Region that: • has rainfall greater than 400mm; and, • is South of the 26th parallel; and, • works are necessary in 'Other than dry conditions'; and, • works have potential for uninfested areas to be impacted.	No	Standard Vehicle and Plant management actions from Principal Environmental Management Requirements (PEMRs) and <u>Hygiene Checklists</u> will be applied. PEMRS associated with the Proposal are provided in Appendix 1.
5b. Do the proposed works require clearing within or adjacent to DBCA managed lands in non-dry conditions?	No	No further action required.
6. Main Roads has been notified by DWER or an environmental specialist that the area to be cleared is susceptible to a pathogen other than dieback.	No	No further action required.

Impact of Clearing	Yes/No or NA	Further Action Required
7. Weeds are likely to spread to and result in environmental harm to adjacent areas of native vegetation that are in good or better condition.	No	No further action required.
8. Did an environmental specialist conduct the survey or field assessment?	Yes	The Environmental Specialist undertaking the biological assessments was suitably qualified and had more than three years' experience.
9. Did an environmental specialist prepare the Assessment Report and any other associated documentation including the VMP, Dieback Management Plan or Offset Proposal?	Yes	The Environmental Specialist preparing the Assessment Report was suitably qualified and had more than three years' experience.

6 REFERENCES

Beeston, G.R., Hopkins, A.J.M. and Shepherd, D.P. (2002). Land-use and vegetation in Western Australia. Department of Agriculture, Western Australia, Resource Management Technical Report 250.

Bureau of Meteorology Australia. Climate Averages for Australian Sites – Karratha – Available online from <http://www.bom.gov.au/climate/data/index.shtml> Accessed 23/11/2022.

CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, Western Australia.

Commonwealth Scientific and Industrial Research Organisation, 2015. Australian Soil Resource Information System (ASRIS). Available online from <http://www.asris.csiro.au> Accessed 23/11/2022

Department of Climate Change, Energy, the Environment and Water. (2022) Protected Matters Search Tool Report. Available online from: <http://www.environment.gov.au/epbc/pmst/index.html> Accessed 23/11/2022.

Department of Climate Change, Energy, the Environment and Water. (2022). Species Profile and Threats Database. Available online from: <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl> Accessed 23/11/2022.

Department of the Environment (2013). *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance, Environment Protection and Biodiversity Conservation Act 1999*. Canberra, Australian Capital Territory.

Department of Natural Resources and Environment (2002). *Biodiversity Action Planning. Action planning for native biodiversity at multiple scales; catchment bioregional, landscape, local*. Department of Natural Resources and Environment, Victoria.

Government of Western Australia (2014a). *A guide to the assessment of applications to clear native vegetation Under Part V Division 2 of the Environmental Protection Act 1986*. Department of Environmental Regulation.

Government of Western Australia. (2018). 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of December 2018. WA Department of Environment and Conservation, Perth, <https://www2.landgate.wa.gov.au/web/guest/downloader>

Natural Resource Management in WA. (2022). SLIP portal, Soil-Landscape Mapping. Available online from: <http://maps.agric.wa.gov.au/nrminfo/framesetup.asp> Accessed 23/11/2022.

Western Australian Herbarium (2022) Florabase - The Western Australian Flora. Department of Parks and Wildlife. Available online from: <https://florabase.dpaw.wa.gov.au/> Accessed 17/05/2022.

Van Vreeswyk, A.M.E., Payne, A.L., Hennig, P., and Leighton, K.A. (2004) An Inventory and Condition Survey of the Pilbara Region, Western Australia. Department of Agriculture, Western Australia

7 APPENDICES

Principal Environmental Management Requirements (PEMR's)

Table 1: Clearing PEMR

STANDARD MANAGEMENT REQUIREMENTS
PRE WORKS 1. The Contractor must prepare, implement and maintain processes to ensure that the movement of all vehicles, plant and machinery does not occur outside of the Limits of Vegetation Clearing. This must include all turnaround areas. 2. The Contractor must minimise vegetation clearing and the area of disturbance on ground by utilising existing cleared area where possible.
DURING WORKS 1. The Contractor must report any damage to vegetation beyond the Limits of Vegetation Clearing as an Environment Incident. 2. The Contractor must ensure Movements are confined to the Limits of Vegetation Clearing during the works. 3. The Contractor must undertake the clearing in accordance with the Fauna PEMR.
POST WORKS NIL

Table 3: Erosion and Sedimentation Control PEMR

PRE WORKS 1. The Contractor must develop, implement and maintain processes and procedures to ensure that: a. The Contractor is responsive to and addresses incidents of erosion and sedimentation within and adjacent to the work areas; b. Prevent water and wind soil erosion within and adjacent to the works areas; c. Prevent the sedimentation and siltation of watercourses located within and adjacent to the works area; d. Ensure that loose surfaces and recently cleared areas are protected from wind and soil erosion; e. Minimise exposed soil working surfaces or protect them from stormwater erosion; f. Ensure material such as gravel, crushed rock and excavated material is stockpiled away from drainage paths and covered to prevent erosion; and, g. Ensure that water quality monitoring is undertaken when turbidity and sedimentation is an issue.
DURING WORKS 1. Implement, monitor and adhere to the sedimentation and erosion processes developed to address the requirements in the pre-works.
POST WORKS 1. If required, the Contractor must continue to monitor water quality until the turbidity/sedimentation dissipates. 2. The Contractor must ensure that disturbed areas are stabilised as soon as is practicable after construction activities are completed.

Table 4: Fauna Management PEMR

PRE WORKS 1. The Contractor must ensure that fauna management requirements are communicated to the crew undertaking the clearing works during the induction and pre-start meeting. 2. Where active nests, burrows or dens are identified, works must not proceed until the Contractor obtains the Superintendents approval of the management of active nests, burrows or dens adheres to the Superintendents advice.
DURING WORKS 2. The Contractor must undertake the clearing in the following manner to allow fauna to move out of the clearing area; a. Prior to the clearing activities commencing, use machinery to tap large trees with habitat hollows to encourage any animals evacuate; and, b. Undertake the clearing in one direction and towards areas of native vegetation to allow the animals to escape to adjacent habitat. 3. The Contractor must ensure that all onsite personnel undertake visual monitoring and are vigilant to the presence of fauna. Any sightings of fauna, including injury or fatality, must be reported as an Environmental Incident. 4. The Contractor must ensure that: a. No pets, traps or firearms are brought into the project area; b. Fauna are not fed; c. Fauna are not intentionally harmed or killed; and, d. Fauna that venture into the work area are encouraged to leave in a manner that does not harm the animal or operator (loud noise, slowly approaching in a vehicle etc.). 5. The Contractor must ensure that in the event that sick, injured or orphaned native wildlife are located on the project site, the WILDCARE Helpline ((08) 9474 9055) will be contacted for assistance. The Contractor must maintain records of any animal taken to a wildlife carer.
POST WORKS 1. The Contractor must provide any records of fauna impact to the Superintendent.

Table 5: Machinery and Vehicle Management PEMR

PRE WORKS 1. The Contractor must ensure that all areas associated with the storage, parking, servicing, wash down and refuelling of all vehicles, plant and machinery is located within the Limits of Clearing and approved by the Superintendent. 2. The Contractor must ensure that all vehicles, machinery and plant are clean on entry (i.e. free of all soil and vegetation material) and comply with the requirements of 204.B.32. 3. The Contractor must ensure that vehicle servicing and refuelling will be undertaken at designated areas approved by the Superintendent. 4. The Contractor must ensure that all staff suitably qualified and competent to undertake works, especially refuelling activities.
DURING WORKS 1. The Contractor must maintain records of checking all vehicles, machinery and plant are clean on entry.
POST WORKS NIL

Table 6: Mulch and Topsoil Management PEMR

PRE WORKS 1. The Contractor must ensure that the movement of soil and vegetation is only undertaken in dry conditions unless otherwise approved and / or directed by the Superintendent. 2. The Contractor must ensure that poor quality topsoil and mulched vegetation does not contaminate the good quality topsoil and vegetation.
DURING WORKS 1. The Contractor must ensure that all machinery used in the removal of weed-infested topsoil must be cleaned down before and between operations to prevent the introduction and spread of weeds. 2. The Contractor must ensure the movement of large equipment over topsoil materials is avoided to minimise compaction. 3. The Contractor must ensure that weed infected topsoil and mulch vegetation must be handled separately to minimise the risk of spreading weed species across the site and stockpiles. 4. The Contractor must ensure that stockpiling operations must occur in a manner to ensure that the properties of the topsoil are not degraded and the topsoil made unsuitable for use in revegetation are not degraded and the topsoil made unsuitable for use in revegetation.
POST WORKS Nil

Table 7: Pegging and Flagging PEMR

PRE WORKS 1. Pegging must be done in accordance with the requirements detailed in Specification 301. 2. The Contractor must clearly communicate, either at the pre-start meeting or equivalent, to the crew undertaking the clearing works, through clear maps and other additional means, what the Pegging represents.
DURING WORKS 1. The Contractor must peg the Limits of Clearing by PINK flagging tape. 2. The Contractor must peg/demarcate vegetation proposed to be retained by WHITE flagging tape. 3. The Contractor must ensure that the vegetation demarcated with PINK and WHITE flagging tape is consistent with the approved clearing areas.
POST WORKS 1. The Contractor remove and dispose of appropriately any demarcation, pegging or flagging once proposal works are completed.

Table 8: Water Drainage Management PEMR

PRE WORKS 1. Use pollution control and containment strategies for proposal activities in Public Drinking Water Source Areas (PDWSAs) / Underground Water Pollution Control Areas (UWPCAs) and liaise with the DWER where necessary.
DURING WORKS 1. Existing natural drainage paths and channels along the road or the vicinity of the project area will not be unnecessarily blocked or restricted. 2. Temporary drainage systems may be installed to carry surface water away from the areas where excavation and foundation construction work is taking place or from any other area where the accumulation of water could cause delay or damage to the work. 3. Maintain these drainage systems in proper working order at all times. 4. Runoff from disturbed areas must be managed to minimise adverse impacts on surrounding vegetation, watercourses and properties. 5. Booms and silt fences must be used when working over or adjacent to areas of surface water in order to protect the quality of surface water from construction impacts.
POST WORKS 1. Water quality monitoring to be undertaken (if turbidity/ sedimentation is an issue). 2. Prior to backfilling the completed pipe work, certify that the entire system is flushed clean and tested. 3. Disturbed areas will be stabilised soon after construction activities are completed. 4. Culvert and drainage structures will be free of all grass, weeds, silt and debris.

Table 9: Weed Management PEMR

PRE WORKS 1. The Contractor must remove or kill any weeds growing in proposal area that are likely to spread and result in environmental harm to adjacent areas of native vegetation that are in good or better condition. 2. The Contractor must develop, implement and maintain procedures to identify and control declared and invasive weed species within the Contract areas, to the satisfaction of the Superintendent. 3. The Contractor must prepare a weed control program, for nominated weed species for control and disposal, to the satisfaction of the Superintendent. 4. The Contractor must undertake weed management in Stockpiles as directed by the Superintendent.
DURING WORKS 1. The Contractor must implement the weed control procedures and management plan and record and manage records of its implementation. 2. The Contractor must treat nominated weed infestations as many times as necessary to control and eradicate the weed species in accordance with the approved weed control program. 3. The contractor must ensure that no known weed, pest or diseased affected soil, mulch, fill or other material is brought into the Site.
POST WORKS 1. The relevant <u>Vegetation Maintenance Record Forms</u> available at: https://www.mainroads.wa.gov.au/technical-commercial/contracting-to-main-roads/ must be completed and sent to the Superintendent.