GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 8540/1
Permit Holder:	Main Roads Western Australia
Duration of Permit:	31 October 2019 to 31 October 2024

The Permit Holder is authorised to clear native vegetation subject to the following conditions of this Permit.

PART I –CLEARING AUTHORISED

1. **Purpose for which clearing may be done**
   Clearing for the purpose of road construction.

2. **Land on which clearing is to be done**
   Lot 106 on Diagram 54806, Osborne Park
   Lot 109 on Diagram 76023, Osborne Park
   Lot 10 on Deposited Plan 2926, Osborne Park
   Lot 15708 on Deposited Plan 22682, Innaloo
   Lot 15712 on Deposited Plan 22683, Innaloo
   Lot 15713 on Deposited Plan 22683, Innaloo
   Lot 1 on Deposited Plan 2926, Osborne Park
   Lot 200 on Deposited Plan 24360, Innaloo
   Lot 201 on Deposited Plan 24360, Innaloo
   Lot 252 on Diagram 61160, Osborne Park
   Lot 301 on Deposited Plan 31320, Innaloo
   Lot 301 on Deposited Plan 33168, Innaloo
   Lot 302 on Deposited Plan 33168, Innaloo
   Lot 303 on Deposited Plan 33168, Innaloo
   Lot 304 on Deposited Plan 33177, Innaloo
   Lot 305 on Deposited Plan 33177, Innaloo
   Lot 306 on Deposited Plan 33177, Innaloo
   Lot 51 on Deposited Plan 14645, Innaloo
   Lot 52 on Deposited Plan 14645, Osborne Park
   Lot 55 on Diagram 23587, Innaloo
   Lot 85 on Deposited Plan 27683, Osborne Park

3. **Area of Clearing**
   The Permit Holder must not clear more than 1.78 hectares of native vegetation within the area hatched yellow on attached Plan 8540/1.

4. **Application**
   This Permit allows the Permit Holder to authorise persons, including employees, contractors and agents of the Permit Holder, to clear native vegetation for the purposes of this Permit subject to compliance with the conditions of this Permit and approval from the Permit Holder.

5. Type of clearing authorised

This Permit authorises the Permit Holder to clear native vegetation for the purpose outlined in condition 1 of this Permit to the extent that the Permit Holder has the power to carry out works involving clearing for that purpose under the *Main Roads Act 1930* or any other written law.

PART II –MANAGEMENT CONDITIONS

6. Avoid, minimise and reduce the impacts and extent of clearing

In determining the amount of native vegetation to be cleared authorised under this Permit, the Permit Holder must have regard to the following principles, set out in order of preference:

(a) avoid the clearing of native vegetation;
(b) minimise the amount of native vegetation to be cleared; and
(c) reduce the impact of clearing on any environmental value.

7. Management of sediment discharge

The Permit Holder shall not cause or allow the discharge of sediments from within the area permitted to be cleared under this Permit, into Herdsman Lake.

8. Dieback and weed control

When undertaking any clearing or other activity authorised under this Permit, the Permit Holder must take the following steps to minimise the risk of the introduction and spread of *weeds* and *dieback*:

(a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;
(b) ensure that no known *dieback* or *weed*-affected soil, *mulch*, *fill* or other material is brought into the area to be cleared;
(c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

PART III - RECORD KEEPING AND REPORTING

9. Records must be kept

(a) The Permit Holder must maintain the following records for activities in relation to the clearing of native vegetation pursuant to condition 3 of this Permit:
  (i) the size of the area cleared (in hectares);
  (ii) the boundaries of the area recorded as a *shapefile or* a co-ordinate of the location where the clearing occurred recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings or decimal degrees;
  (iii) the date(s) on which the clearing was done;
  (iv) actions taken to avoid, minimise and reduce the impacts and extent of clearing in accordance with condition 6 of this Permit;
  (v) actions taken to not cause or allow the discharge of sediments from within the area permitted to be cleared under this Permit, into Herdsman Lake in accordance with condition 7 of the Permit; and
  (vi) actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 8 of the Permit.

10. Reporting

The Permit Holder must provide to the *CEO* the records required under condition 9 of this Permit, when requested by the *CEO*.

Definitions

The following meanings are given to terms used in this Permit:

CEO: means the Chief Executive Officer of the Department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*;

dieback means the effect of *Phytophthora* species on native vegetation;

fill means material used to increase the ground level, or fill a hollow;

mulch means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation;

shapefile means a shapefile consisting of polygons using the Geocentric Datum of Australia (GDA);

weed/s means any plant -

(a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or
(b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or
(c) not indigenous to the area concerned.

Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

1 October 2019

Plan 8540/1

31.897427°S 31.897427°S

115.795486°E 115.810353°E

115.795486°E 115.810353°E

31.904456°S 31.904456°S

Legend

- Roads
- Imagery
- Clearing Instruments Activities
- Local Government Authority

N

0 200m

1:7,450

(Approximate when reproduced at A4)

GDA 94 (Lat/Long)

Geocentric Datum of Australia 1994

..... Date 1 October 2019

Mathew Gannaway

Officer with delegated authority under Section 20 of the Environmental Protection Act 1986

GOVERNMENT OF WESTERN AUSTRALIA

Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 8540/1
Permit type: Purpose Permit

1.2. Applicant details

Applicant's name: Commissioner of Main Roads Western Australia
Application received date: 11 June 2019

1.3. Property details

Property:
Lot 106 on Diagram 54806, Osborne Park
Lot 109 on Diagram 76023, Osborne Park
Lot 10 on Deposited Plan 2926, Osborne Park
Lot 15708 on Deposited Plan 22682, Innaloo
Lot 15712 on Deposited Plan 22683, Innaloo
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Lot 85 on Deposited Plan 27683, Osborne Park

Local Government Authority: Stirling, City of
Localities: Osborne Park and Innaloo

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	Purpose category:
1.78		Mechanical Removal	Road construction or upgrades

1.5. Decision on application

Decision on Permit Application: Granted
Decision Date: 1 October 2019

Reasons for Decision:

The clearing permit application has been assessed against the clearing principles, planning instruments and other matters in accordance with section 51O of the *Environmental Protection Act 1986* (EP Act). It has been concluded that the proposed clearing is at variance to principle (f), may be at variance to principle (g), (h) and (i), and is not likely to be at variance to the remaining principles.

Through assessment it was determined that the proposed clearing will impact on vegetation growing in association with a wetland and may cause sedimentation of surface water of the nearby Herdsman Lake. The Delegated Officer considered that the wetland vegetation within the proposed clearing area does not contain conservation significant wetland values due to the small amount of vegetation to be cleared and the current level of disturbance. In addition, avoid and minimise, weed and dieback management and drainage management conditions will mitigate any potential impacts on Herdsman Lake.

In granting a clearing permit subject to conditions, the Delegated Officer determined that the proposed clearing is not likely to have any unacceptable environmental impacts.

2. Site Information

Clearing Description

The application is to clear 1.78 hectares of native vegetation within numerous properties in Osbourne Park and Innaloo for the purpose of Phase one of the Stephenson Avenue extension project, extending from Scarborough Beach Road to Howe Street.

Vegetation Description

The vegetation within the application area has been mapped as Swan Coastal Plain vegetation complex, Herdsman Complex which is described as Sedgelands and fringing woodland of *Eucalyptus rudis* (Flooded Gum) - *Melaleuca* species (Heddle et al., 1980).

A flora and vegetation survey conducted by Anders Environmental Consultancy (2019) identified two vegetation units within the application area being;

- *Eucalyptus rudis* and *Eucalyptus gomphocephala* mid woodland over weed species *Acacia iteaphylla*, *Acacia saligna* and *Schinus terebinthifolius* tall open shrubland over **Cynodon dactylon*, **Ehrharta calycina* and **Eragrostis curvula* low tussock grassland in Completely Degraded condition.
- *Eucalyptus rudis* mid open forest over *Melaleuca preissiana* low open woodland over *Pteridium esculentum* low fernland in Good to Degraded condition (Anders Environmental Consultancy, 2019).

Vegetation Condition

The application area is determined to be in a good to completely degraded condition, described as:

- Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994).
- Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).
- Completely Degraded: No longer intact, completely/almost completely without native species (Keighery, 1994).

Soil type

Two soil types have been mapped within the application area (DPIRD, 2019), being;

- P Phase subsystem, described as peat black clayey in part, saturated fibrous organic soils; and
- S7 Phase subsystem, described as sand pale and olive yellow, medium to coarse grained sub angular to sub rounded quartz, trace of feldspar, moderately sorted, of residual origin.

Local area description

The local area considered in the assessment of this application is defined as a 10 kilometre radius measured from the perimeter of the combined project areas.

Comment

Vegetation condition and description has been obtained from the flora survey.

Figure 1: Application area for CPS 8540/1 hatched blue.

3. Minimisation and mitigation measures

Main Roads Western Australia (MRWA) have advised that a detailed design process has reduced the impacts to native vegetation from 2.45 hectares to 1.78 hectares.

MRWA have advised that no sedimentation will enter the existing drain that runs through the application. Any flows to the main drain (if required to drain into the construction area) will either be detained in a basin to allow sediment to drop out of suspension prior to flowing to the drain or be filtered through a silt fence.

MRWA has also developed a project environmental management plan (PEMP) which outlines mitigation measures for the proposed clearing including but not limited to;

- Minimisation of clearing where possible;
- Clearing vegetation only when necessary and treat areas requiring soil stabilization as soon as practicable to reduce soil erosion;
- Clearing of vegetation will not exceed the limits of clearing and mature trees will be conserved as far as practicable, and will not be disturbed for such temporary works as side tracks, access tracks, temporary storage areas, spoil areas or site offices;
- Damage caused (beyond the extent of approvals) during the construction to vegetation, landforms, or fauna habitat shall be rehabilitated to the pre-clearing condition;
- Vehicle movements will not disturb vegetation and heavy vehicle turnaround is limited to designated areas;
- All machinery will be 'clean on entry' (free of soil, seeds and vegetation) and cleaned in designated areas, between operations to prevent the introduction and spread of weeds (especially Declared) or dieback;
- Clearing will be done in such a way as to allow fauna to move out of the clearing area, if possible (MRWA, 2019).

4. Assessment of application against clearing principles

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

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

The vegetation proposed to be cleared consists of river gum (*Eucalyptus rudis*) closed forest over grassy weeds with some areas of tuarts (*Eucalyptus gomphocephala*) in a Good to Completely Degraded condition (Anders Environmental Consultancy, 2019, MRWA, 2019).

A flora and vegetation survey of the application area and surrounding vegetation identified 40 native species and 72 weed species (Anders Environmental Consultancy, 2019). Species diversity is considered low as the application area is in a predominantly degraded condition.

As discussed in principle (b), the vegetation proposed to be cleared does not consist of significant habitat for threatened or local fauna species.

As discussed in principle (c), no threatened flora has been identified within the application area during the spring flora and vegetation survey (Anders Environmental Consultancy, 2019).

As discussed in principle (d), the application area is not considered to represent any state listed Threatened Ecological Communities (TEC).

A Commonwealth listed TEC, under the *Environmental Protection and Biodiversity Conservation Act* 1999 (EPBC Act) has been mapped within the local area of the proposed clearing being; 'Tuart Woodlands and Forests of the Swan Coastal Plain'. The flora and vegetation survey has identified tuarts within the area proposed to be cleared (Andes Environmental Consultancy, 2019). It is not considered for the vegetation within the application area to represent this TEC as it does not meet the key diagnostic characteristics or condition thresholds for the TEC as outlined in the conservation advice (DotEE, 2019).

No priority flora or priority ecological communities (PECs) were recorded within the application area during the flora survey (Anders Environmental Consultancy, 2019). It is not considered for the application area to provide habitat for priority flora or PECs.

Given the above, it is not considered for the proposed clearing to contain vegetation that comprises a high level of biodiversity. The proposed clearing is not likely to be at variance to this Principle.

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

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

Seven fauna species, listed as threatened under the *Biodiversity and Conservation Act* 2016 (BC Act) within the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* and 14 other species of conservation importance have been recorded within the local area (DBCA, 2007-).

Carnaby's cockatoo (*Calyptorhynchus latirostris*), listed as endangered, Baudin's cockatoo (*Calyptorhynchus baudinii*) and forest red-tailed cockatoo (*Calyptorhynchus banksii* subsp. *naso*), listed as vulnerable (collectively herein referred to as black cockatoos) under both the BC Act and the EPBC Act have been recorded within the local area. Black Cockatoos breed in large hollow-bearing trees, generally within woodlands or forests or in isolated trees (Commonwealth of Australia, 2012). These species nest in hollows in live or dead trees of karri, marri, wandoo, tuart, salmon gum, jarrah, flooded gum, York gum, powder bark, bullich and blackbutt (Commonwealth of Australia, 2012).

An on-site black cockatoo habitat assessment undertaken by Anders Environmental Consultancy in March 2018 did not identify suitable breeding habitat for black cockatoos within the application area (Anders Environmental Consulting, 2018). Whilst approximately 30 trees were identified as having small hollows, no hollows large enough to be suitable for black cockatoos were observed (Anders Environmental Consulting, 2018). Given this, it is not likely for the application rea to contain significant breeding habitat for black cockatoos. The applicant has advised that clearing of vegetation will not exceed the limits of clearing and mature trees will be conserved as far as practicable (MRWA, 2019).

Common foraging items for black cockatoo species includes seeds, flowers and nectar of Proteaceous plant species, *Eucalyptus* spp. and *Callistemon* spp. (Commonwealth of Australia, 2012). The project area contains suitable foraging habitat (Eucalyptus species) for black cockatoo species. However, the black cockatoo habitat assessment identified that very little suitable foraging habitat is present within the application area and that the quality of foraging habitat that occurs is considered low (Anders Environmental Consulting, 2018).

The application area is in close proximity to Herdsman Lake Regional Park which contains vegetation in better condition compared to that which occurs within the application area. Given this, and noting the relatively small size of the application area and its Degraded condition, the application area is not likely to contain significant habitat for the remaining fauna species recorded within the local area.

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

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

Proposed clearing is not likely to be at variance to this Principle
According to available datasets, no records of threatened flora occurs within the application area (DBCA, 2007-).

Three threatened flora species have been recorded within the local area. They being *Caladenia huegelii, Picris compacta* and *Diuris drummondii* (DBCA, 2007). The preferred habitat for these species does not occur within the application area (WA Herbarium, 1998-).

A flora survey of the application area did not identify any threatened flora species (Anders Environmental Consultancy, 2019).

The proposed clearing is not likely to be at variance to this Principle.

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

Proposed clearing is not likely to be at variance to this Principle
No state listed TECs have been recorded within the application area. The closest mapped state listed TEC to the application area is SCP20a *Banksia attenuata* woodlands over species rich dense shrublands which is listed as Endangered under the BC Act.

Two flora and vegetation surveys did not identify any TECs within the application area (Anders Environmental Consultancy, 2018, 2019). Therefore, the proposed clearing is not likely to be part of, or necessary for the maintenance of a state listed TEC.

The proposed clearing is not likely to be at variance to this Principle.

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

Proposed clearing is not likely to be at variance to this Principle
The National Objectives and Targets for Biodiversity Conservation 2001-2005 include a target to have clearing controls in place that prevent clearance of ecological communities with an extent below 30 per cent of that present pre-1750 (i.e. pre-European settlement) (Commonwealth of Australia, 2001).

As indicated in Table 2, the Swan Coastal Plain bioregion and the mapped Swan Coastal Plain vegetation complex retain greater than 30 per cent of their pre-European extents.

The local area (10 kilometre radius) retains approximately 15 per cent native vegetation and is considered a highly cleared landscape.

As assessed under Principle (a), (b), (c) and (d), the application area does not contain high biodiversity or significant habitat for threatened flora, fauna or TECs. Given this, the application area is not considered a significant remnant.

Given the above, the application area is not considered a significant remnant in a highly cleared area and the proposed clearing is not likely to be at variance to this Principle.

Table 1: Remnant native vegetation extents (Government of Western Australia, 2018)

	Pre-European (ha)	Current Extent (ha)	Remaining (%)	Extent in DBCA Managed Lands (%)
IBRA Bioregion				
Swan Coastal Plain	1,501,222	578,432	39	38
Swan Coastal Plain vegetation complex				
Herdsman Complex	9,665	3,104	32	11

(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 at variance to this Principle

The application area includes native vegetation growing in, and in association with a watercourse and a wetland and is therefore at variance to this principle.

The application area occurs within Stirling Wetland, a Resource Enhancement (RE) Sump land (UFI 8177) located within the Balcatta consanguineous suite. RE wetlands are wetlands which have been partly modified but still support substantial functions and attributes and have the potential to be restored to conservation category (EPA, 2008).

A major drain runs through the centre of the application area. This drain, flows through into Herdsman Lake, a conservation category wetland that occurs 780 metres to the south of the application area. The applicant has advised that no sedimentation will enter the existing drain that runs through the application area. Any flows to the main drain (if required to drain during the construction area) will either be detained in a basin to allow sediment to drop out of suspension prior to flowing into the drain or be filtered through a silt fence (MRWA, 2019).

A flora and vegetation survey has identified 1.78 hectares of wetland dependent vegetation within the application area consisting of *Eucalyptus rudis* woodland in a predominantly degraded condition (Anders Environmental Consultancy, 2019). Given the predominantly degraded condition of the riparian vegetation and that the mapped wetland has been highly modified, it is not considered for the proposed clearing to impact on significant wetland vegetation.

Given the above, the proposed clearing is at variance to this Principle.

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

Proposed clearing may be at variance to this Principle.

As outlined under Section 2, the application area is mapped as consisting of two soil subsystems, P Phase subsystem and S7 Phase subsystem.

Table 2: Land degradation risks (DPIRD, 2019)

Risk categories	P Phase subsystem	S7 Phase subsystem
Wind erosion	<3% high to extreme hazard	>70% high to extreme
Water erosion	50-70 % mod to very high risk	Low risk
Salinity	<3 % high risk	<3 % high risk
Flood risk	<3% mod to high risk	Low risk
Water logging	50-70 % mod to very high risk	Low risk
Phosphorus export risk	50-70% high to extreme hazard	3-10% high to extreme

Based on the mapped land degradation risk outlined above (Table 2), the proposed clearing has a low likelihood of causing land degradation in the forms of salinity and flooding (DPIRD, 2019).

P Phase subsystem has a high to extreme risk of water erosion and Phosphorus export and S7 Phase subsystem has a high to extreme risk of water erosion (DPIRD, 2019). Given this, the proposed clearing may cause land degradation through soil erosion and phosphorus export.

P Phase subsystem also has a moderate to very high risk of waterlogging (DPIRD, 2019). However, given the relatively small area proposed to be cleared (1.78 hectare), it is considered for the risk of waterlogging to be negligible.

Given the above, the proposed clearing may cause appreciable land degradation through water erosion and phosphorus export and may be at variance to this Principle.

The applicant has advised that clearing of native vegetation will only occur when necessary and areas that require soil stabilization will be done as soon as practicable to reduce soil erosion (MRWA, 2019).

In addition, the applicant's PEMP includes the requirement to provide erosion/ scour protection controls where necessary to prevent impacts to wetlands, management of potential stormwater drainage into wetlands through the construction of drainage structures and ensuring that existing natural drainage paths and channels along the road or the vicinity of the project area will not be unnecessarily blocked or restricted (MRWA, 2019).

(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 may be at variance to this Principle

Herdsman Lake Regional Park (also mapped as Bush Forever site 281) occurs 780 metres south of the application area. The application area contains a wetland that has been identified within the Gnangara Mound Ecological linkage that provides a non-continuous linkage between Herdsman Lake and surrounding remnant vegetation.

The Department of Biodiversity Conservation and Attractions (DBCA) advised that regional ecological linkages such as the one within the application area provide important refuges within a highly modified industrial area such as the one that surrounds the area proposed to be cleared. Herdsman Lake Regional Park management plan (CALM, 2004-2013) highlights the value of ecological linkages to the Herdsman Lake in maintaining water quality. Significant clearing and development around the lake has resulted in the current degraded values of the lake and further clearing has the potential to further threaten this system (DBCA, 2019).

The vegetation proposed to be cleared is in a degraded condition, however still contains hydrological value in contributing to maintaining water quality of Herdsman Lake. Therefore, the proposed clearing may be at variance to this Principle.

As outlined in Principle (g), the applicant has developed a PEMP and will ensure that no sedimentation will enter the existing drain that runs through the application area. Sedimentation controls will be put in place to prevent impacts to the water quality of Herdsman Lake (MRWA, 2019).

(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 may be variance to this Principle

Groundwater salinity within the application area is mapped at 500-1000 total dissolved solids, milligrams per litre. This level of groundwater salinity is classified as 'fresh'. Given this level, the proposed clearing is not likely to increase groundwater salinity.

As discussed in Principle (f), the application area is mapped as a RE wetland and a major drain that flows through to Herdsman Lake, a conservation category wetland, occurs through the centre of the application area.

Advice from DBCA indicates that a major threat to Herdsman Lake is pollutants and sedimentation entering the lake through the stormwater drain system (DBCA, 2019). As discussed under Principle (g), the proposed clearing may cause the transportation of phosphorous and sediments into Herdsman Lake through the drain that occurs within the application area, causing deterioration of the quality of surface water.

As outlined in Principle (g), the applicant has developed a PEMP and will ensure that no sedimentation will enter the existing drain that runs through the application area. Sedimentation controls will be put in place to prevent impacts to surface water quality (MRWA, 2019).

Given the potential impacts to surface water, the proposed clearing may be at variance to this Principle.

(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

Less than three per cent of the mapped soil units has a moderate to high flood risk. Based on this relatively low risk of flooding, the proposed clearing is not likely to cause or exacerbate, the incidence or intensity of flooding.

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

Planning instruments and other relevant matters.

The application is for the purpose of Phase one of the Stephenson Avenue extension project, extending from Scarborough Beach Road to Howe Street. Phase one of the project also includes the realignment of the Water Corporation Drain that occurs within the application area (MRWA, 2019).

DBCA (2019) has advised that to reduce the impact to Herdsman Lake, consideration should be given to creating an ecologically functional drain within the application area to provide habitat and filtration through appropriate planting and water sensitive urban design.

The application area does not occur within a *Rights In Water and Irrigation Act 1918* surface water or ground water area.

No Aboriginal sites of significance have been mapped within the application area.

The clearing permit application was advertised on the Department of Water and Environmental Regulation website on 04 July 2019 with a 21 day submission period. No public submissions have been received in relation to this application.

5. References

Anders Environmental Consultancy (2018) Flora and Vegetation Survey and Threatened Black Cockatoo Assessment, Stephenson Avenue Extension Project. Prepared for WSP. April 2018. DWER ref A1795960

Anders Environmental Consultancy (2019) Flora and Vegetation Survey, Stephenson Avenue Extension Project. Prepared for Main Roads Western Australia. January 2019. DWER ref A1795960

Commonwealth of Australia (2001) National Objectives and Targets for Biodiversity Conservation 2001-2005, Canberra.

Commonwealth of Australia (2012). EPBC Act referral guidelines for three threatened black cockatoo species. Department of Sustainability, Environment, Water, Populations and Communities, Canberra.

Department of the Environment and Energy (2019). *Approved Conservation Advice (incorporating listing advice) for the Tuart* (Eucalyptus gomphocephala) *woodlands and forests of the Swan Coastal Plain ecological community*. Canberra: Department of the Environment and Energy. Available from: http://www.environment.gov.au/biodiversity/threatened/communities/pubs/153-conservation-advice.pdf. In effect under the EPBC Act from 04-Jul-2019.

Department of Biodiversity, Conservation and Attractions (DBCA) (2007-) NatureMap: Mapping Western Australia's Biodiversity. Department of Parks and Wildlife. URL: http://naturemap.dpaw.wa.gov.au/. Accessed August 2019

Department of Biodiversity, Conservation and Attractions (DBCA) (2019) Wetland advice for clearing permit application CPS 8540/1. DWER ref A1817392

Department of Primary Industries and Regional Development (2019) NRInfo Digital Mapping. Department of Primary Industries and Regional Development. Government of Western Australia. URL: https://maps.agric.wa.gov.au/nrm-info/ (accessed July 2019).

Heddle, E. M., Loneragan, O. W., and Havel, J. J. (1980) Vegetation Complexes of the Darling System, Western Australia. In Department of Conservation and Environment, Atlas of Natural Resources, Darling System, Western Australia.

Government of Western Australia (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/dbc

Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.

MRWA (2019) Stephenson Avenue Extension (Phase 1) Project Environmental Management Plan (PEMP). June 2019. DWER ref A1826573.

WA Herbarium (1998-) FloraBase - The Western Australian Flora. Department of Parks and Wildlife. http://florabase.dpaw.wa.gov.au/ (Accessed 01/09/2019).

GIS databases:

- CPS Areas applied to clear
- NatureMap (conservation significant fauna)
- DAFWA Subsystems V5
- Soils of WA
- Vegetation Complexes – Swan Coastal Plain
- Managed Tenure
- Environmentally Sensitive Areas
- TPFL Data July 2019
- WAHerb Data July 2019
- Aboriginal Sites Register
- IBRA Vegetation WA
- WA TECPEC
- Land Degradation Hazards