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WESTERN AUSTRALIA

Clearing Assessment Report – CPS 818

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Leonora Laverton Rd Material Pits [REDACTED]
Leonora Laverton Road M22
Goldfields-Esperance Region
2507

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1. PROPOSAL

1.1. Purpose and Justification

This proposal is for material investigation, excavation, extraction and screening at three (3) material pit sites for the purpose of road construction for future project works within Goldfields-Esperance Region (GER). Initial investigations will inform the final size and location of each material pit area. The pit area will allow for stockpiling of vegetation, topsoil, gravel, screening and truck turnarounds. The use of existing (and ongoing maintenance) of access tracks to allow transport of material between material pits and Leonora Laverton Road (Rd) is also included in this proposal.

The proposed material pits and access tracks disturbance area is to be contained within the Proposal Area boundary of 75.5 hectares (ha), as shown in spatial data presented as Figure 1.

Leonora Laverton Rd is a strategic freight and inter-town route. The efficiency and reliability of the main road is vital to the mining and agricultural sectors of the GER. Having readily available access to quality road construction materials is vital to the maintenance and upgrade of the state road networks in the GER.

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. 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

Main Roads proposes to use a D9 or D10 bulldozer to progressively clear vegetation, stockpile vegetation and topsoil materials, and extract and stockpile gravel/ road construction material within the Proposal Area. Suitable road construction material will be screened and stockpiled ready for use on Leonora Laverton Rd projects located between Leonora and Laverton.

Access to the pit areas will be maintained via the existing access roads accessible from Leonora Laverton Rd, where possible. Additional clearing along existing tracks will be required to allow appropriate clearances for machinery to safely access the pit locations and enter/exit the main road.

The clearing of up to 61.2 ha of native vegetation (Clearing Area) within a 75.5 ha Proposal Area will be required. The clearing of native vegetation will be undertaken progressively as required utilising Main Roads' State-wide Clearing Permit, CPS 818/16 (or subsequent version). Clearing will be managed to ensure CPS 818 GER clearing limits are not exceeded annually.

1.3. Proposal Location

The Clearing Area is located on Leonora Laverton Rd (M022) [REDACTED], between Leonora and Laverton, in the Shire of Leonora and Shire of Laverton as shown in Figure 1.

1.4. Clearing Details

Proposed Clearing to be undertaken using CPS 818:

61.2 ha

Areas of Native Vegetation Clearing:

The areas of native vegetation to be cleared are shown in [REDACTED]

Figure 2 and [REDACTED]

Figure 3.

Type of Native Vegetation:

Three vegetation types were identified within the Proposal Area within the two major vegetation groups; Acacia Forests and Woodlands (MVG 6) and Acacia Open Woodlands (MVG 13).

One vegetation type is associated with MVG 6 described below.

CLP-AW1:

Acacia caesaneura open woodland over *Acacia ramulosa*, *Eremophila forrestii* and *Scaevola spinescens* sparse shrubland over *Maireana thesioides* low isolated shrubs.

Two vegetation types are associated with MVG 13, as described below.

RP-AOW1–

Acacia caesaneura, *A. oswaldii* and *Santalum lanceolatum* isolated trees over *Eremophila pantonii*, *E. paisleyi* subsp. *paisleyi* and *Senna artemisioides* subsp. *filifolia* sparse shrubland over *Maireana triptera*, *M. thesioides* and *Cheilanthes sieberi* low sparse shrubland

RP-AOW2–

Acacia caesaneura sparse woodland over *Ptilotus obovatus* var. *obovatus*, *Psydrax suaveolens* and *Acacia tetragonophylla* sparse shrubland over *Maireana triptera* low open shrubland

The type of vegetation to be cleared under this Proposal is shown in [REDACTED]

Figure 2 and [REDACTED]

Figure 3.

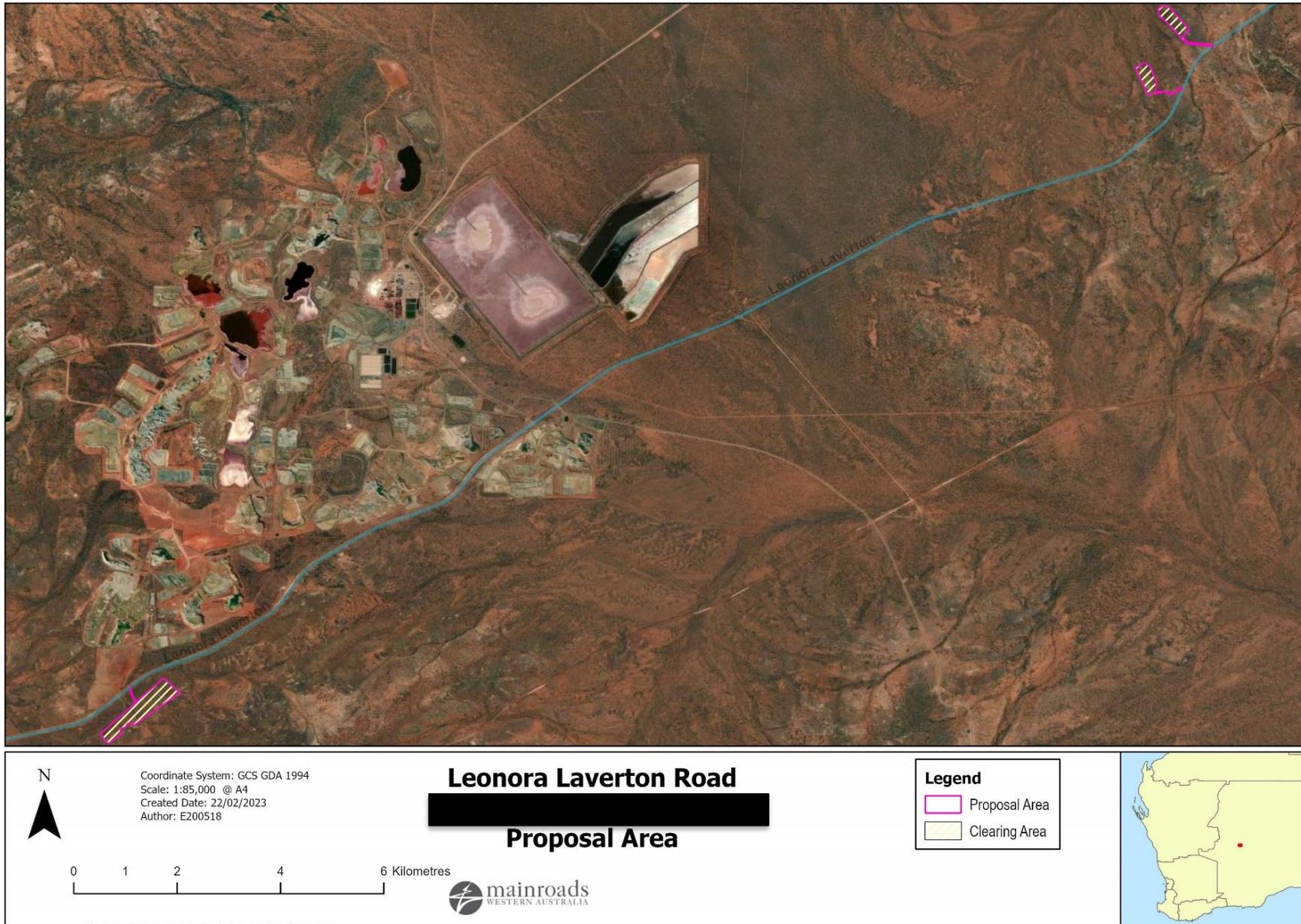


Figure 1 Proposal Area with Vegetation Clearing Area

[REDACTED]

Figure 2 Vegetation within Proposal Area – [REDACTED] Material Pit

[REDACTED]

Figure 3 Vegetation within Proposal Area – [REDACTED] Material Pit

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 road, however this will potentially result in a poorer safety outcome and may result in future fatalities or serious injuries and further degradation of the State road asset.

The GER does not have sufficient volumes of road construction material available within a feasible distance for future Projects planned to be delivered. This proposal has been developed based on its long-term viability to supply upcoming and future Projects with suitable resources.

Main Roads WA investigated the use of commercial sources of material and existing cleared areas with gravel potential. No reliable or economically viable sources were identified that would provide the region with the ability to deliver future Projects

- Main Roads retains frangible vegetation where a clear zone is to be established for road projects. For this project, however, clearing will only be required to accommodate the road formation, with no clear zone being established. Accordingly, the retention of frangible vegetation does not apply to this proposal.
- Reducing the speed limit to minimise clearing requirements, while still balancing safety (driver fatigue) and freight efficiency. Speed Limits are an essential mechanism to ensure the safe and efficient operation of road networks. The application of appropriate speed limits and other traffic management measures is a key mechanism in managing vehicle speeds to achieve desired safety, mobility, traffic management, local amenity, and road user expectations. There are several factors involved in road safety, including road conditions, driver behaviour and overall road design. Except in special situations, reducing speed limits below national standards on state and national roads is not typically supported as it has the potential to contribute to driver frustration, impatience, tiredness and recklessness. The environmental values protected by reducing the speed limit, do not justify the impacts on freight efficiencies nor road user safety. Accordingly, the reduction of the speed limits to avoid clearing of native vegetation for this proposal is not proposed.

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.

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

Design or Management Measure	Discussion and Justification
Simplification of design to reduce number of lanes and/or complexity of intersections	Existing cleared haul roads, used historically for mineral exploration activities, will be used for access from Leonora Laverton Rd, where possible, to facilitate safe access to material pits. For the duration of material extraction, access tracks will be maintained for suitability.
Use of existing cleared areas for access tracks, construction storage and stockpiling	Two existing access roads (Leonora Laverton Rd [REDACTED]) are proposed to be used to access proposed material pits from Leonora Laverton Rd. The existing cleared access track will require minimal widening to allow machinery to safely access material pits. This proposal will require the existing access tracks and haul roads to be utilised for the duration of works, maintenance of the existing cleared areas is anticipated and will avoid future impacts to undisturbed vegetation for access to material pit locations.

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 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).

Environmental Protection Policies:

- Environmental Protection (Peel Inlet - Harvey Estuary) Policy 1992
- Environmental Protection (Western Swamp Tortoise Habitat) Policy 2011.

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 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 818/16, Main Roads must prepare a Clearing Assessment Report (CAR).

The CAR 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 *Environmental Protection Act 1986* (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**– 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.
- **Proposal Area** – The total footprint of the Proposal including both cleared and uncleared areas. This is based on the current design. A buffer area has been applied to allow for constructability and the movement of machinery during construction.
- **Study Area** – Area covered by the Desktop Assessment. The Study Area for the Proposal is confined to a local area of a 30 km radius.
- **Survey Area**– Area covered by the 2021 Biological Survey undertaken by Botanica Consulting (Botanica).

2.2. Desktop Assessment

A desktop assessment of the Proposal Area was undertaken by viewing internal datasets and other government agency managed databases, and consulting with relevant stakeholders where necessary. Results from searches can be found in Appendix 1.

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 were searched to locate additional information, which are found under References in Section 8.

2.3. Surveys and Assessments

The following surveys/assessments were undertaken to inform this CAR:

- Botanica Consulting (2021) Flora, Vegetation and Fauna Assessment of the Leonora-Laverton Road Material Pits [REDACTED]

A summary of the methodology and the results of the above surveys are provided in Section 3.

Biological and targeted surveys conducted for the proposal are outlined in Table 2.

Table 2. Summary of Biological and Targeted Surveys Relevant to the Proposal

Consultant & Survey Name	Survey Details
<p>Botanica Consulting (2021) Flora, Vegetation and Fauna Assessment of the Leonora-Laverton Road Material Pits [REDACTED]</p>	<p>Survey Area: Survey Area comprised 77.5 ha accessed via Leonora-Laverton Road, [REDACTED]. The Survey Area encompasses the 75.5 ha Proposal Area.</p> <p>Type:</p> <ul style="list-style-type: none"> • Desktop assessment within a 30 kilometre (km) radius of the Leonora Laverton Rd Material Sources [REDACTED] Survey Area (referred to as the 'Desktop Study Area'); • Basic fauna survey of the Leonora-Laverton Rd Material Pits [REDACTED], covering an Survey Area of approximately 77.5 ha; and • Targeted flora survey and detailed flora and vegetation survey of the Leonora-Laverton Rd Material Pits [REDACTED] Survey Area of approximately 77.5 ha. <p>Timing: Detailed flora and vegetation survey and a targeted flora survey on the 29th July 2021.</p> <p>Survey Area: 77.5 ha</p>

3. SURVEY RESULTS

A copy of the relevant sections of the executive summary and report conclusions from the biological survey and/or field assessments are provided in Appendix 2.

3.1. Summary of Flora and Vegetation Survey

A 77.5 ha area was surveyed comprising proposed material pits and the existing access tracks, accessed via the Leonora Laverton Rd [REDACTED]. The Survey Area is located across two Local Government Areas (LGA), predominately within the Shire of Laverton [REDACTED] and [REDACTED] located between the Shire of Laverton and Shire of Leonora.

The Survey mapped three vegetation types, which was representative of one pre-European vegetation association (vegetation association Great Victoria Desert 18).

The Survey Area was mapped as predominately Acacia Forests and Woodlands (39 ha) with the remaining vegetated area composed of Acacia Open Woodlands (23.7 ha). Vegetation condition is considered Very Good (80.9%), with existing gravel extraction pits, access roads and water discharge areas in a Completely Degraded (19.1%) condition, Botanica (2021).

The desktop assessment identified six Priority flora taxa (as listed by the DBCA) as potentially occurring within the Botanica (2021) Survey Area. None of the Priority flora identified in the desktop assessment were mapped within the Survey Area and no additional Priority flora were recorded during the field survey. Following the field assessment, all Priority flora identified as possible to occur from the desktop assessment are considered unlikely to occur within the Survey Area based on their preferred habitat (Botanica, 2021)

The DBCA's Priority/ Threatened Ecological Communities Database Search did not identify any Threatened Ecological Community (TEC) listed under the Commonwealth EPBC Act or BC Act as occurring within the desktop Survey Area (Botanica 2021). No TEC's were identified within the Desktop Study Area. Three PEC's were identified as occurring within 30 km of the Desktop Study Area, following the field survey (Botanica ,2021), none were considered to likely or possibly occur within the Survey Area.

3.2. Summary of Fauna Survey

Two broad scale terrestrial fauna habitats were identified within the Survey Area (Botanica, 2021), consisting of; *Acacia* woodland (39 ha) and *Acacia* Sparse Woodland (23.7 ha). Results of a desktop review and observations made during the field survey identified nine amphibians, 35 non-volant mammals, 12 volant mammals, 105 birds and 78 reptile species as having been previously recorded in the Desktop Study Area, which have the potential to occur within the Survey Area (Botanica, 2021).

No Threatened fauna or other specially protected species as listed under the Western Australian BC Act or the Commonwealth EPBC Act were identified within the Survey Area, in addition no Priority fauna as listed by DBCA were recorded within the Survey Area (Botanica, 2021).

Based on the habitats identified during the field survey and/or recent nearby records, three (3) species of significance (Peregrine Falcon (*Falco peregrinus*) "Other Specially Protected Species (BC Act)", Grey Falcon (*Falco hypoleucos*) "Vulnerable (EPBC Act and BC Act)" and Malleefowl (*Leipoa ocellata*) "Vulnerable (EPBC Act and BC Act)" may have some possibility of occurring within the wider area, but not necessarily within the Survey Area (Botanica, 2021)

The biological survey did not identify any potential nest sites for Peregrine Falcon (*Falco peregrinus*) and it is unlikely to breed within the Survey Area, however, the species has a large home range and may potentially occur as an occasional overfly visitor to the Survey Area.

Suitable habitat for the Grey Falcon (*Falco hypoleucos*) may be present and the species may occasionally utilise the Survey Area as part of its much larger home range, however, is not likely to represent critical habitat (Botanica, 2021).

No evidence of Malleefowl (*Leipoa ocellata*) activity (inactive or active mounds, tracks, feathers or bird observations etc.) were observed within the Survey Area. Habitat was considered to be marginal or unsuitable for breeding, however, occasional transients could potentially occur within the Survey Area (Botanica, 2021).

4. VEGETATION DETAILS

4.1. Proposal Site Vegetation Description

The vegetation in the Clearing Area consists of a two major vegetation groups and three vegetation types (Botanica, 2021).

The dominant vegetation group (MVG 6) consists of Acacia Forests and Woodlands composed of one vegetation type, representing over 65% of the Clearing Area. The remaining 35% of the Clearing Area is represented by Main Vegetation Group Acacia Open Woodlands (MVG 13) and consists of two vegetation types, further described in Table 3.

The Clearing Area is represented by a total of 17 families, 20 genera and 46 taxa. The vegetation condition of all vegetation to be cleared is considered to be in Very Good condition. A high level of disturbance (Completely Degraded) was identified over 14.8 ha (19.1%) of the Survey Area as a result of an existing gravel pits, access tracks and water discharge areas (Botanica, 2021).

One species of introduced flora, *Salvia verbenaca* (Wild Sage), was recorded within the [REDACTED] Proposal Area. This species is not listed as a Weed of National Significance nor a Declared Pest in Western Australia (Botanica 2021).

Table 3 and Table 4 below provide detail of the vegetation type within the Clearing Area and the remaining pre-Europeans extents of each vegetation association.

For a full description of the existing vegetation, refer to the Botanica, 2021 Biological Report found at TRIM Ref D22#140738.

Table 3. Summary of Vegetation Types within Clearing Area

NVIS Major Vegetation Group	Vegetation Type	Vegetation Code	Area (ha)	Area (%)
Acacia Open Woodlands (MVG 13)	<i>Acacia caesaneura</i> , <i>A. oswaldii</i> and <i>Santalum lanceolatum</i> isolated trees over <i>Eremophila pantonii</i> , <i>E. paisleyi</i> subsp. <i>paisleyi</i> and <i>Senna artemisioides</i> subsp. <i>filifolia</i> sparse shrubland over <i>Maireana triptera</i> , <i>M. thesioides</i> and <i>Cheilanthes sieberi</i> low sparse shrubland	RP-AOW1	8.2	13.9
	<i>Acacia caesaneura</i> sparse woodland over <i>Ptilotus obovatus</i> var. <i>obovatus</i> , <i>Psyrax suaveolens</i> and <i>Acacia tetragonophylla</i> sparse shrubland over <i>Maireana triptera</i> low open shrubland	RP-AOW2	12.0	20.2
Acacia Forests and Woodlands (MVG 6)	<i>Acacia caesaneura</i> open woodland over <i>Acacia ramulosa</i> , <i>Eremophila forrestii</i> and <i>Scaevola spinescens</i> sparse shrubland over <i>Maireana thesioides</i> low isolated shrubs	CLP-AW1	39.0	65.9
TOTAL			61.2	100

Table 4. 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.18 Great Victoria Desert Low woodland; mulga (<i>Acacia aneura</i>)	Statewide	19,892,306	19,843,148	99	6
	IBRA Bioregion Murchison	12,403,172	12,363,252	99	5
	IBRA Sub-region Eastern Murchison	10,269,896.44	10,234,838.22	99	5
	Local Government Authority SHIRE OF LAVERTON SHIRE OF LEONORA	2,878,673 2,010,057	2,878,673 2,002,508	99 99	6 2

5. ASSESSMENT AGAINST THE TEN CLEARING PRINCIPLES

In assessing whether the Proposal's proposed 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 Proposal requires the clearing of up to 61.2 ha of native vegetation across two major vegetation groups and three vegetation types, as mapped during the Biological Survey (Botanica, 2021). The two major vegetation groups (MVG); Acacia Forests and Woodlands (MVG 6) and Acacia Open Woodlands (MVG 13), were mapped within the Clearing Area, as described below.

Vegetation type within MVG 6

CLP-AW1; *Acacia caesaneura* open woodland over *Acacia ramulosa*, *Eremophila forrestii* and *Scaevola spinescens* sparse shrubland over *Maireana thesioides* low isolated shrubs.

Vegetation types within MVG 13

RP-AOW1; *Acacia caesaneura*, *A. oswaldii* and *Santalum lanceolatum* isolated trees over *Eremophila pantonii*, *E. paisleyi* subsp. *paisleyi* and *Senna artemisioides* subsp. *filifolia* sparse shrubland over *Maireana triptera*, *M. thesioides* and *Cheilanthes sieberi* low sparse shrubland

RP-AOW2; *Acacia caesaneura* sparse woodland over *Ptilotus obovatus* var. *obovatus*, *Psydrax suaveolens* and *Acacia tetragonophylla* sparse shrubland over *Maireana triptera* low open shrubland

The Biological survey identified all vegetation within the Clearing Area to be in a Very Good condition (Botanica, 2021).

A desktop assessment was completed to inform the biological field survey which identified 12 Priority flora species previously recorded within a 30 km Study Area surrounding the Proposal Area. No Threatened Flora or Priority Flora species were previously recorded within the Proposal Area, although the Priority 3 *Eremophila annosicaulis* has been recorded <1 km from the Proposal Area of Material Pit [REDACTED]. A "likelihood of occurrence" assessment based on distribution and known preferred habitat identified six Priority flora species may "possibly" occur within the Proposal Area (Botanica, 2021), noted below :

- *Acacia websteri* (P1)
- *Acacia sp. Marshall Pool* (G. Cockerton 3024) (P3)
- *Cratystylis centralis* (P3),
- *Hybanthus floribundus* subsp. *chloroxanthus* (P3)
- *Hemigenia exilis* (P4)

The biological survey did not identify any Threatened flora taxa listed under EPBC Act or BC Act within the Proposal Area, in addition no Priority or otherwise significant flora were identified within the Proposal Area (Botanica 2021).

Based on the results of the field survey, a post survey likelihood of occurrence assessment considered the Priority flora listed as “possible” by the original desktop assessment. All the listed species were determined “unlikely” to occur within the Proposal Area following the field assessment (Botanica, 2021), further detail on each species is provided below.

- *Acacia websteri* (P1) – unlikely to occur

Preferred habitat of deep red sands were not observed within the Survey Area. It is a perennial species that was actively searched for during the field assessment and not located. Based on DBCA records, the closest known location of this species occurs approximately 6 km from the Proposal Area, no additional records are known to occur within the Study Area.

- *Acacia* sp. Marshall Pool (G. Cockerton 3024) (P3) – unlikely to occur

Preferred habitat of low basalt hills on brown clay loam, based on DBCA data, was observed within the Survey Area. It is a perennial species that was actively searched for during the field assessment and not located. The nearest known population, based on DNCA records, is approximately 25 km from the Proposal Area.

- *Cratystylis centralis* (P3) - unlikely to occur

Preferred habitat of red sandy loams with ironstone gravel were not observed within the Survey Area. It is a perennial species that was actively searched for during the field assessment and not located. The closest record of this species, based on DBCA database, is located approximately 5 km from the Proposal Area.

- *Eremophila annosicaulis* (P3) – unlikely to occur

Preferred habitat of red sandy loams with ironstone gravel were not observed within the Survey Area. It is a perennial species that was actively searched for during the field assessment, and all *Eremophila* within the survey area were identified to species level. The closest known records of this species, based on DBCA database, occurs approximately 300 m from the Proposal Area associated with the [REDACTED] Material Pit.

- *Hybanthus floribundus subsp. chloroxanthus* (P3) – unlikely to occur

Preferred habitat of rocky areas, creeks and drainage lines were not observed within the Survey Area. This taxon is a perennial species that was actively searched for during the field assessment and not located. The closest known DBCA record of this species occurs approximately 5 km from the Proposal Area.

- *Hemigenia exilis* (P4)) – unlikely to occur

Preferred habitat of red lateritic hillslopes were not observed within the Survey Area. This taxon is a perennial species that was actively searched for during the field assessment and not located. Based on available DBCA flora records the closest known location of this species occurs approximately 7 km from the Proposal Area of the [REDACTED] Material Pit. This record was recorded over 11 years ago. No additional records occur within 10 km of the Proposal Area.

No significant vegetation or ecological communities were identified within the Proposal Area (Botanica, 2021), the Proposal will not impact any known significant vegetation or ecological communities.

Two broad scale terrestrial fauna habitats (Clay-loam plain and Rocky Plain) were identified within the Clearing Area, excluding areas mapped as cleared. Fauna habitats are summarised in Table 5.

Table 5 Fauna habitats identified in the Clearing Area

Fauna Habitat	Description	Representative Fauna Attributes	Significant Species that possibly occur in habitat
<u>Clay-loam Plain</u> Acacia Woodland Area= 36.2 ha	Clay-loam plain comprising of <i>Acacia</i> woodland over mid mixed shrubs and low sparse chenopod shrubs.	<ul style="list-style-type: none"> Ground not especially suited to burrowing species. Low diversity vegetation strata supporting moderate avifauna assemblage. Low to moderate vegetation density and low leaf litter. 	<p>Malleefowl <i>Leipoa ocellata</i></p> <p>Peregrine Falcon <i>Falco peregrinus</i></p> <p>Grey Falcon <i>Falco hypoleucos</i></p>
<u>Rocky Plain</u> Acacia Sparse Woodland Area= 23.7 ha	Rocky plain comprising sparse <i>Acacia</i> woodland over mid mixed shrubs and low chenopod shrubs.	<ul style="list-style-type: none"> Ground not especially suited to burrowing species. Low vegetation diversity moderate strata. Low-density vegetation and low leaf litter. 	<p>Malleefowl <i>Leipoa ocellata</i></p> <p>Peregrine Falcon <i>Falco peregrinus</i></p> <p>Grey Falcon <i>Falco hypoleucos</i></p>

A desktop assessment identified a total of 239 fauna species as potentially occurring within 30 km radius of the Proposal Area. Of these, nine are amphibians, 47 mammals (12 Volant and 35 Non-Volant), 78 reptile and 105 birds (Botanica, 2021).

No significant fauna or observations of their presence were identified within the area surveyed. Following the field survey, the status of some fauna species on site and/or in the general area was difficult to confirm, however based on the fauna habitats observed and/ or recent nearby records, the three species of significance were regarded 'possible' to occur in the wider area (but not necessarily within the clearing areas) (Botanica 2021). Species determined as 'possible to occur are discussed below:

Malleefowl (*Leipoa ocellata*) - Vulnerable (EPBC Act and BC Act)

This species is occasionally recorded in the Eastern Murchison subregion. Habitat (woodlands and scrublands) was determined as marginal/or unsuitable for breeding during the field survey, however the species is considered to be a possible and only occasional transient within the Clearing Area. No evidence of malleefowl activity (inactive or active mounds, tracks, feathers or bird observations etc.) were observed within the Survey Area. Historic records of the species maintained by DBCA identifies one occurrence of the species within 200m of the Clearing Area for the [REDACTED] Material Pit. This was recorded over 12 years ago and no additional records exist within 30 km of the Proposal Area. Impacts to the species are unlikely.

Grey Falcon (*Falco hypoleucos*) - Vulnerable (EPBC Act and BC Act)

This species is sparsely recorded throughout inland Australia. Suitable feeding habitat (open woodland) occurs within the Clearing Area, no critical breeding habitat for the species was observed within the Survey Area. Occurrence of this species may occur infrequently (if ever) for short periods of time only. The closest historical record of this species, based on the DBCA database, is located over 10 km from the proposed Clearing Area. This was recorded over 27 years ago and no additional records occur within 25 km of the Proposal Area. Impacts to the species are unlikely.

Peregrine Falcon (*Falco peregrinus*) - OS (BC Act)

This species potentially utilises some sections of the Survey Area as part of a much larger home range, though records in this area are uncommon. The Peregrine Falcon requires abundant prey and secure nest sites, and prefers coastal and inland cliffs or open woodlands near water. No potential nest sites or breeding habitat was observed during the field survey within the Survey Area. The closest known record of this species, based on DBCA database, was recorded over 11 years ago > 5 km from any proposed Clearing Area. No additional records occur within 10 km of the Proposal Area. It is considered unlikely that the species will breed within the Survey Area. Impacts to the species are unlikely.

It was determined that all three species may potentially occur as occasional transients as part of larger home ranges, however, are unlikely to breed within the Proposal Area due to lack of suitable nesting or breeding habitat. No significant fauna species are likely to be significantly impacted by proposed activities.

None of the identified significant fauna taxa were recorded within the Proposal Area during the field survey. The result of the literature review and observations made during the field survey indicate that the probability of any of the above-mentioned fauna species actually occurring with the Survey Area is low (Botanica, 2021).

As such, the proposed clearing is not likely to be at variance to this Principle.

Methodology

- Biological Survey (Botanica, 2021)
- Government GIS Shapefiles:
 - DBCA Threatened and Priority Ecological Community database search (Accessed 28/06/2023)
 - DBCA Threatened and Priority flora database search (Accessed 28/06/2023),
 - DBCA WA Herbarium database search (Accessed 28/06/2023),
 - DBCA Threatened and Priority fauna database search (Accessed 28/06/2023),
- 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 fauna survey was undertaken over the Clearing Area (Botanica, 2021) in which two broad fauna habitats were described to occur (Table 5, see principle (a)). Three significant transient species; Peregrine Falcon (*Falco peregrinus*), Grey Falcon (*Falco hypoleucos*) and Malleefowl (*Leipoa ocellata*) were assessed as 'possible' to occur within the Project Area based on suitable feeding habitat.

Peregrine Falcon (*Falco peregrinus*) –Other Specially Protected Species (BC Act)

This species potentially occurs aerially over the Survey Area as part of a much larger home range, though records in this area are rare and therefore it may only be an occasional visitor. No observations of this species or potential nest sites were observed during the field survey, it is unlikely that the Proposal Area provided significant breeding habitat. The nearest historical record (2012) is located approximately 5 km south-west of the Proposal Area encompassing the Clearing Area for [REDACTED] material pit. Impacts to the species are unlikely.

Grey Falcon (*Falco hypoleucos*) - Vulnerable (EPBC Act and BC Act)

This species is sparsely recorded throughout inland Australia. Suitable feeding habitat is present within the Proposal Area, however, no evidence of critical breeding habitat was observed within the Proposal Area. No observation or evidence of this species was identified within the Survey Area. The species may potentially utilise the Proposal Area as part of a much larger home range. Impacts to this species is unlikely, the closest historical record of this species (1996) occurred approximately 10 km west of the Proposal Area encompassing [REDACTED] material pit Clearing Area.

Malleefowl (*Leipoa ocellata*) –Vulnerable (EPBC Act and BC Act)

This species is occasionally recorded in the Eastern Murchison subregion. A fauna habitat over the Proposal Area (Botanica, 20121) identified habitat as marginal/or unsuitable for breeding due to sparse vegetation cover, however transient species may potentially occur within the Proposal Area. No evidence of Malleefowl activity (inactive or active mounds, tracks, feathers or bird observations etc.) were observed within the Proposal Area during the habitat assessment. The closest Malleefowl record is located approximately 175 m north of the [REDACTED] material pit Proposal Area (DBCA Database). Impact to this species is unlikely, measures will be included in Construction Environmental Management Plan (CEMP) to ensure Malleefowl are visually monitored for during all operations to avoid unexpected incidents to the species.

While the Clearing Area may potentially support individual transient Malleefowl the proposed clearing will not threaten critical fauna habitat essential for the species survival. Similarly, conservation significant avian species Peregrine Falcon (*Falco peregrinus*) and Grey Falcon (*Falco hypoleucos*) are known to occur in the region and may potentially visit the Proposal Area due to the present of suitable feeding habitat. No visual evidence or observations of conservation significant species occurrence were identified within the Proposal Area that suggest the Clearing Area supports habitat necessary for their existence (Botanica, 2021).

The proposed Clearing Area adjoins large tracts of remnant vegetation in similar structure and condition which is known to contain historical records of the conservation significant fauna identified above. The proposed clearing of native vegetation within the Proposal Area is well represented across the state and region (see Section 4 above) and will not restrict local or regional fauna ecological linkages.

The proposed Clearing Area does not contain significant fauna habitat values necessary for the maintenance of fauna indigenous to Western Australia, clearing is not likely to at variance to this principle.

Methodology

- Biological Survey (Botanica, 2021)
- Government GIS Shapefiles:
 - DBCA Threatened and Priority Ecological Community database search (Accessed 28/06/2023)
 - DBCA Threatened and Priority flora database search (Accessed 28/06/2023),
 - DBCA WA Herbarium database search (Accessed 28/06/2023),
 - DBCA Threatened and Priority fauna database search (Accessed 28/06/2023)
- Statewide Vegetation Statistics (Government of Western Australia 2018)

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.**Proposal is not at variance to this Principle.****Assessment**

The results of the desktop assessment and literature review undertaken as part of the biological survey (Botanica, 2021) including searches of the DBCA significant flora databases and the DCCEE Protected Matters Search Tool did not identify any Threatened flora previously recorded within the proposed Clearing Area (Botanica, 2021). The field survey conducted by Botanica (2021) did not identify any Threatened flora within the Clearing Area.

The desktop component of the biological assessment identified a total of 12 Priority flora species listed under the BC Act to potentially occur within the 30 km Study Area, however, no Threatened Flora were identified within Study Area. These taxa were assessed for distribution and known habitat to determine their likelihood of occurrence within the Survey Area, six Priority flora taxa were determined as "possible" to occur in the Proposal Area, however, following the field survey all species were considered 'unlikely' to occur within the Proposal Area. Descriptions of each are included in Principle (a).

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

Methodology

- Biological Survey (Botanica, 2021)
- Government GIS Shapefiles:
 - DBCA Threatened and Priority Ecological Community database search (Accessed 28/06/2023)
 - DBCA Threatened and Priority flora database search (Accessed 28/06/2023),
 - DBCA WA Herbarium database search (Accessed 28/06/2023),
 - DBCA Threatened and Priority fauna database search (Accessed 28/06/2023)

(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 at variance to this Principle.

Assessment

No Threatened Ecological Communities (TEC) were identified as occurring under the *Biodiversity Conservation* (BC) Act or the *Environmental Protection and Biodiversity Conservation* (EPBC) Act. The vegetation types that were assessed as occurring within the Clearing Area are not considered representative of any State of Federal listed TEC (Botanica, 2021).

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

Methodology

- Biological Survey (Botanica, 2021)
- Government GIS Shapefiles:
 - DBCA Threatened and Priority Ecological Community database search (Accessed 28/06/2023)

(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 at variance to this Principle.

Assessment

The Proposal occurs within the Eastern Murchison IBRA Sub-region, of which approximately 99% pre-European extent is remaining (Government of WA, 2019).

The following pre-European Vegetation Association has been mapped within the Clearing Area:

- Veg Assoc No. 18 - Great Victoria Desert, Low woodland; mulga (*Acacia aneura*)

The National Objectives and Targets for Biodiversity Conservation recognise that the retention of 30% or more of the pre-clearing extent of each ecological community is necessary if Australia’s biological diversity is to be protected (Commonwealth of Australia 2001) except in constrained areas (Perth & Peel) where 10% representation should be maintained.

Table 6 Pre-European Vegetation Associations within Proposal Area

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. 18 Great Victoria Desert Low woodland; mulga (<i>Acacia aneura</i>)	Statewide	19,892,306	19,843,148	99	6
	IBRA Bioregion	12,403,172	12,363,252	99	5
	IBRA Sub-region	10,269,896	10,234,838	99	5
	Local Government Authority				
	SHIRE OF LAVERTON	2,878,673	2,878,673	99	6
SHIRE OF LEONORA	2,010,057	2,002,508	99	2	

Pre-European Vegetation Association 18 (Great Victoria Desert) is well represented having over 99% remaining at all scales.

The proposed clearing is not expected to impact on connectivity with other remnant vegetation in the local area or reduce the capacity of the remaining vegetation within the local area to act as an ecological linkage.

Taking the above into consideration, the clearing of vegetation associated with this Proposal is considered not at variance to this Principle.

Methodology

- Biological Survey (Botanica, 2021)
- Government GIS shapefiles:
 - Pre-European Vegetation DPIRD-006 (Accessed 21/02/2023)
- Statewide Vegetation Statistics (Government of Western Australia, 2019) (Accessed 21/02/2023)

(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**

A desktop search of Surface hydrology databases did not identify any surface water features within approximately 15 km of the Proposal Area. The closest surface drainage feature is a non-perennial/intermittent river located approximately 15 kms south-east of the Proposal Area associated with Lake Carey. Minor non-perennial/intermittent drainage features occur throughout the local landscape, no drainage lines occur within the Proposal Area, no vegetation associated with a wetland/watercourse occur within the Clearing Area (Botanica, 2021).

Proposed clearing is not at variance to this Principle.

Methodology

- Biological Survey (Botanica, 2021)
- Government GIS shapefiles:
 - Directory of Important Wetlands in Australia – Western Australia DBCA-045 (28/06/2023)
 - Hydrology Linear DWER-031 (28/06/2023)
 - Surface Hydrolines Regional (28/06/2023)
 - Wild Rivers DWER-087 (28/06/2023)

(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 Proposal Area lies within the Austin Botanical District within the Eremaean Province of WA and is defined by the vegetational expression of Yilgarn Block geological boundary.

Soil types observed during the biological survey within the Proposal Area are consistent with the Yilgarn Block geological boundary and consist of shallow clay-loams and rocky plains on red earthy sands. The climate is arid, with summer and winter rains and a very low average annual rainfall of 200 mm (Botanica, 2021).

Regional National Resource Mapping (NRM) in addition to Australian Soil Resource Information System (ASRIS) acid sulfate soil risk mapping indicates that the Proposal Area contains;

- alkaline soils of a low water holding capacity,
- soil surface with a high and water wind erosion risk, and
- is within an area of moderate to high waterlogging risk.

Drainage features within the local area are non-perennial and typically dry for most of the year, only flowing immediately following significant rainfall. Flooding due to rainfall and erosion through natural surface flows is not likely to adversely affect the Clearing Area due to the flat terrain of the Proposal Area and very low average annual rainfall. Localised ponding of water may result following rainfall, however, given that peak rainfall occurs between January to March (Botanica, 2021) evaporation rates are expected to be very high. In addition, the cleared material pit floor will be concave to avoid surface water flows release to the surrounding environment.

Clearing will be undertaken progressively on an as needs basis which will reduce the potential for any appreciable land degradation. Areas exhausted of suitable road construction materials will be closed and managed to encourage revegetation. Pit areas to be closed will be ripped, stockpiled topsoil and vegetation is to be backspread over the surface to reduce degradation and encourage regeneration of vegetation.

Other standard management techniques will be incorporated in the Project CEMP / PEMR to manage potential operational impacts on the surrounding environment. Standard PEMRs are presented in Appendix 3.

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

Methodology

- Biological Survey (Botanica, 2021)
- Government GIS Shapefiles:
 - NRM DRIRP Acid Sulphate Soil Risk Map (Accessed 22/02/2023)
 - NRM DRIRP Soil landscape land quality – Water Erosion Risk (Accessed 22/02/2023)
 - NRM DRIRP Soil landscape land quality – Wind Erosion Risk (Accessed 22/02/2023)
 - NRM DRIRP Soil landscape land quality – Salinity Risk (Accessed 22/02/2023)
 - NRM DRIRP Soil landscape land quality – Surface Acidity (Accessed 22/02/2023)
 - NRM DRIRP Soil landscape land quality – Waterlogging Risk (Accessed 22/02/2023)
 - NRM DRIRP Soil landscape land quality – Flood Risk (Accessed 22/02/2023)

- Australian Soil Resource Information System, Atlas of Australian Acid Sulfate Soils (Accessed 22/02/2023)

(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

Proposed clearing is not expected to impact the environmental values of any conservation reserves or the surrounding area. There are no existing, proposed or recommended conservation reserves within 30 km of the Proposal Area.

There are no wetlands of international importance (Ramsar Wetlands), national importance (Australian Nature Conservation Agency Wetlands) or DBCA managed waters within 30 km of the Proposal Area.

There are no proposed or gazetted conservation reserves within the 30 km of the Proposal Area.

The closest area of conservation significance is the Niagara Dam Nature Reserve located approximately 115 km south-west of the Proposal Area.

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

Methodology

- Biological Survey (Botanica, 2021)
- Government GIS Shapefiles:
 - Directory of Important Wetlands in Australia - Western Australia DBCA-045 (Accessed 22/02/2023)
 - DBCA Legislated Lands and Waters; DBCA-011 (Accessed 22/02/2023)
 - DBCA Lands of Interest; DBCA-012 (Accessed 22/02/2023)
 - EPA Redbook Recommended Conservation Reserves 1976-1991; DBCA-029 (Accessed 22/02/2023)
- Clearing Regulations - Environmentally Sensitive Areas DWER-046 (Accessed 22/02/2023)

(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**

The Proposal is situated within the Goldfields Groundwater Area, Proclaimed Groundwater Area (RIWI Act). The Proposal does not occur within a Public Drinking Water Source Area (PDWSA), the Lenora Water Reserve is located approximately 29 km north of the Proposal Area. No impact to the PDWSA will occur from proposed activities.

Wetlands and watercourses are considered in principle (f) above, no wetlands or waterways occur within 15 km of the Proposal Area.

No surface or ground water will be abstracted as part of this proposed clearing. If water resources are identified to be required in the future, all relevant licences (to construct a bore/to extract water) will be obtained.

Taking the above into consideration, it is unlikely that Proposal will cause any deterioration in the quality of surface or underground water. The proposed clearing is not at variance to this Principle.

Methodology

- Biological Survey (Botanica, 2022)
- Government GIS Shapefiles:
 - RIWI Act, Surface Water Areas and Irrigation Districts (Accessed 28/06/2023)
 - RIWI Act, Groundwater Areas (Accessed 28/06/2023)
 - Directory of Important Wetlands in Australia - Western Australia DBCA-045 (Accessed 28/06/2023)
 - Hydrography Linear DWER-031 (Accessed 28/06/2023)

(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 at variance to this Principle.

Assessment

The Proposal Area is located within a flat-plain with no surface drainage features within 15 km. Localised ponding of water may result following extreme rainfall, however, given the regions low annual rainfall (~200 mm) and peak rainfall occurs between January to March (Botanica, 2021) evaporation rates are expected to be very high.

Cleared areas to allow for material extraction will be shaped to have a concave pit floor, surface water will be withheld within the cleared areas, surface flows to the surrounding environment are not anticipated to occur.

Typically, rainfall events are not likely to result in flooding events across the Proposal Area. Proposed clearing will not increase the likelihood or intensify impacts of flooding within or adjacent to the Proposal Area.

Taking the above into consideration, the proposed clearing is not at variance to this Principle.

Methodology

- Biological Survey (Botanica, 2021)
- Government GIS Shapefiles:
 - NRM DRIRP Acid Sulphate Soil Risk Map (Accessed 22/02/2023)
 - NRM DRIRP Soil landscape land quality – Water Erosion Risk (Accessed 22/02/2023)
 - NRM DRIRP Soil landscape land quality – Wind Erosion Risk (Accessed 22/02/2023)
 - NRM DRIRP Soil landscape land quality – Salinity Risk (Accessed 22/02/2023)
 - NRM DRIRP Soil landscape land quality – Surface Acidity (Accessed 22/02/2023)
 - NRM DRIRP Soil landscape land quality – Waterlogging Risk (Accessed 22/02/2023)
 - NRM DRIRP Soil landscape land quality – Flood Risk (Accessed 22/02/2023)

6. REHABILITATION, REVEGETATION & OFFSETS

6.1. Revegetation and Rehabilitation

No temporary clearing will be undertaken as part of the Proposal activities.

6.2. Offset Proposal

No offset proposal is required as the proposed clearing will not result in significant residual impacts to native vegetation within the region.

7. 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 7.

Table 7. Summary of Additional Management Actions Required by CPS 818

Impact of Clearing	Yes/No or NA	Further Action Required
1. The CAR 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	
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: <ul style="list-style-type: none"> 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
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.
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.

Impact of Clearing	Yes/No or NA	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 and any other associated documentation including the VMP, Dieback Management Plan or Offset Proposal was suitably qualified and had more than three years' experience.

8. REFERENCES

Department of Agriculture, Water and the Environment (2022). *Referral guideline for 3 WA threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black cockatoo*. Canberra, Australian Capital Territory.

Botanica Consulting (2021) Flora, Vegetation and Fauna Assessment of the Leonora-Laverton Road Material Pits [REDACTED]

Commonwealth Scientific and Industrial Research Organisation, 2015. Australian Soil Resource Information System (ASRIS). Available online from <http://www.asris.csiro.au> Accessed June 2023.

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 Climate Change, Energy, the Environment and Water. (2023) Protected Matters Search Tool Report. Available online from: <http://www.environment.gov.au/epbc/pmst/index.html> Accessed June 2023.

Department of Environment and Conservation (2014). *A guide to the assessment of applications to clear native vegetation under Part V Division 2 of the Environmental Protection Act 1986*. Department of Environment Regulation. Perth, Western Australia.

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.

Environmental Protection Authority (2020). *Technical Guidance – Terrestrial Vertebrate Fauna Surveys for Environmental Impact Assessment*. Perth, Western Australia.

Environmental Protection Authority (2016). *Technical Guide – Terrestrial Flora and Vegetation Surveys for Environmental Impact Assessment* (eds. K Freeman, G Stack, S Thomas and N Woolfrey). Perth, Western Australia.

Government of Western Australia. (2019). 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of July 2023. WA Department of Biodiversity, Conservation and Attractions, Perth. Available online from: <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>

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 (2014b). *WA Environmental Offset Guidelines*. Perth, Western Australia.

Government of Western Australia (2011). *WA Environmental Offset Policy*. Perth Western Australia.

Havel, J.J. and Mattiske, E.M. (2000) *Vegetation Mapping of South West Forest Regions of Western Australia*. Prepared for CALMSCIENCE, Department of Conservation and Land Management and Environment Australia

Hedde, E. M., Loneragan, O. W., and Havel, J. J (1980) *Atlas of Natural Resources Darling System, Western Australia*. Department of Conservation and Environment.

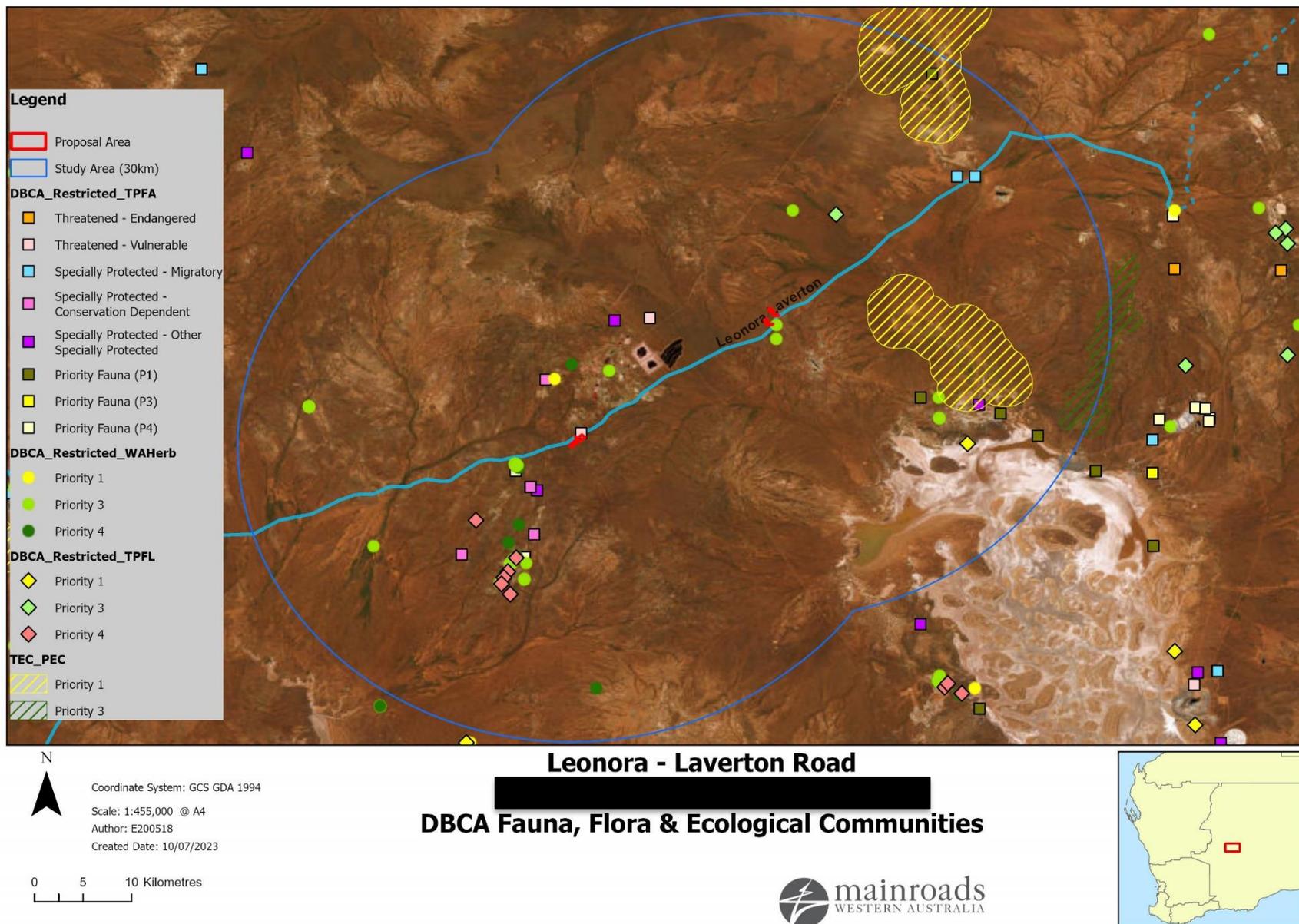
Natural Resource Management in WA. (2023) SLIP portal, Soil-Landscape Mapping. Available online from: <http://maps.agric.wa.gov.au/nrminfo/framesetup.asp>
Accessed June 2023.

Western Australian Herbarium. 1998–2023 *FloraBase* - The Western Australian Flora. Department of Biodiversity, Conservation and Attractions. Available online from: <https://florabase.dpaw.wa.gov.au/>
Accessed June 2023.

Webb, A., Kinloch, J., Keighery, G., & Pitt, G. (2016). *The Extension of Vegetation Complex Mapping to Landform Boundaries with the Swan Coastal Plain Landform and Forested Region of South-west Western Australia*. Perth: Department of Biodiversity, Conservation and Attractions.

9. APPENDICES

Appendix 1: Environmental Constraints Map



Appendix 2: Biological Surveys and Field Assessment Executive Summary and Report Conclusions

Flora, Vegetation and Fauna Assessment of the Leonora-Laverton Road Material Pits [REDACTED] (Botanica 2021)

Executive Summary

Botanica Consulting Pty Ltd (Botanica) was commissioned by Main Roads Western Australia (Main Roads) to undertake the following assessments of [REDACTED] project areas along the Leonora-Laverton Rd (referred to as the 'study area'):

- Desktop flora and vegetation assessment within a 30 kilometre (km) radius of the Leonora-Laverton Rd Material Pits [REDACTED] (referred to as the 'desktop study area');
- Targeted flora survey and detailed flora and vegetation survey of the Leonora-Laverton Rd Material Pits [REDACTED], covering an area of approximately 77.5 ha (referred to as the 'survey area'); and
- Basic fauna survey of the Leonora-Laverton Rd Material Pits [REDACTED], covering an area of approximately 77.5 ha (referred to as the 'survey area').

The Leonora-Laverton Rd Material Pits project areas [REDACTED] are approximately 48.2 ha, 13.7 ha and 15.6 ha in extent respectively for a total survey area of 77.5 ha. The project areas are intended to be purposed for gravel extraction.

Botanica conducted a detailed flora and vegetation survey and targeted flora survey on the 29th July 2021. The survey area was traversed via 4WD and on foot by Jennifer Jackson (Senior Botanist, BSc (Honours) Environmental Management) and Matthew Nedlands (Environmental Technician). A total of 11 quadrats (50m X 50m) were installed and surveyed, and opportunistic notes were taken throughout the survey effort.

Three vegetation types were identified within the survey area which were representative of two pre-European vegetation associations (association 18 and 28) of the Great Victoria Desert and Laverton System. These vegetation types were identified within two landform types and comprised of two major vegetation group, which were represented by a total of 17 families, 23 genera and 46 taxa. No Threatened Flora or Threatened Ecological Communities as listed under the *Western Australian Biodiversity Conservation (BC) Act 2016* or *Commonwealth Environment Protection and Biodiversity Conservation (EPBC) Act 1999* were identified within the survey area.

Based on the vegetation condition rating scale specified in the *Environmental Protection Authority (EPA) Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment – December 2016* (EPA, 2016a), vegetation was rated as 'Very Good'. Disturbance in the area was a result of existing gravel extraction pits, access roads and water discharge areas. One introduced flora taxon was identified within the survey area, which is not listed as a Declared Pest or Weed of National Significance.

No Priority Flora were listed on the Department of Biodiversity, Conservation and Attractions (DBCA) database as occurring within the survey area. The desktop assessment identified six Priority Flora taxa as possibly occurring within the survey area based on their broad habitat descriptions/soil types.

No Priority Flora were identified within the survey area. Based on the field assessment, all Priority Flora identified as possible to occur from the desktop assessment were considered to be unlikely to occur within the survey area. No Priority Ecological Communities (as listed by DBCA) were identified within the survey area. Three Priority Ecological Communities occur within the desktop study area.

Two fauna habitats were identified within the survey area. Results of the literature review identified 40 mammals (including 12 bat species), 105 bird, 78 reptile, and 9 frog species as having been previously recorded in the general area, some of which have the potential to occur within the survey area.

Three conservation significant fauna were identified in the desktop assessment as potentially occurring within the survey area based on their habitat preferences including Mulga woodland and forests.

1. Malleefowl (*Leipoa ocellata*)-Threatened (Vulnerable)
2. Grey Falcon (*Falco hypoleucos*) – Threatened (Vulnerable)
3. Peregrine Falcon (*Falco peregrinus*)-Other specially protected species

No Threatened fauna taxon as listed under the Western Australian BC Act and Commonwealth EPBC Act was identified within the survey area. No Priority fauna as listed by DBCA were recorded within the survey area.

There are no wetlands of international importance (Ramsar Wetlands) or national importance (Australian Nature Conservation Agency Wetlands) within the survey area nor proposed or gazetted conservation reserves within the survey area.

Appendix 3: Principal Environmental Management Requirements (PEMR's)

Table 1: Clearing PEMR

STANDARD MANAGEMENT REQUIREMENTS
<p>PRE WORKS</p> <ol style="list-style-type: none">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.
<p>DURING WORKS</p> <ol style="list-style-type: none">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.
<p>POST WORKS</p> <p>NIL</p>

Table 2: Erosion and Sedimentation Control PEMR

<p>PRE WORKS</p> <ol style="list-style-type: none">1. The Contractor must develop, implement and maintain processes and procedures to ensure that:<ol style="list-style-type: none">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 sedimentation and siltation of drainage lines due to the removal of riparian vegetation is avoided, minimised and mitigated;e. Ensure that loose surfaces and recently cleared areas are protected from wind and soil erosion;f. Minimise exposed soil working surfaces or protect them from stormwater erosion;g. Ensure material such as gravel, crushed rock and excavated material is stockpiled away from drainage paths and covered to prevent erosion; and,h. Ensure that water quality monitoring is undertaken when turbidity and sedimentation is an issue.
<p>DURING WORKS</p> <ol style="list-style-type: none">1. Implement, monitor and adhere to the sedimentation and erosion processes developed to address the requirements in the pre-works.
<p>POST WORKS</p> <ol style="list-style-type: none">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 3: Fauna Management PEMR

<p>PRE WORKS</p> <ol style="list-style-type: none">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.
<p>DURING WORKS</p> <ol style="list-style-type: none">2. The Contractor must undertake the clearing in the following manner to allow fauna to move out of the clearing area;<ol style="list-style-type: none">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:<ol style="list-style-type: none">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.
<p>POST WORKS</p> <ol style="list-style-type: none">1. The Contractor must provide any records of fauna impact to the Superintendent.

Table 4: Machinery and Vehicle Management PEMR

<p>PRE WORKS</p> <ol style="list-style-type: none">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.
<p>DURING WORKS</p> <ol style="list-style-type: none">1. The Contractor must maintain records of checking all vehicles, machinery and plant are clean on entry.
<p>POST WORKS</p> <p>NIL</p>

Table 5: Mulch and Topsoil Management PEMR

<p>PRE WORKS</p> <ol style="list-style-type: none">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.
<p>DURING WORKS</p> <ol style="list-style-type: none">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 Dieback and weed infected topsoil and mulch vegetation must be handled separately to minimise the risk of spreading dieback and 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.
<p>POST WORKS</p> <p>Nil</p>

Table 6: Pegging and Flagging PEMR

<p>PRE WORKS</p> <ol style="list-style-type: none">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.
<p>DURING WORKS</p> <ol style="list-style-type: none">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.
<p>POST WORKS</p> <ol style="list-style-type: none">1. The Contractor remove and dispose of appropriately any demarcation, pegging or flagging once proposal works are completed.

Table 7: Water Drainage Management PEMR

<p>PRE WORKS</p> <ol style="list-style-type: none">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.
<p>DURING WORKS</p> <ol style="list-style-type: none">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.
<p>POST WORKS</p> <ol style="list-style-type: none">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 8: Weed Management PEMR

<p>PRE WORKS</p> <ol style="list-style-type: none">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.
<p>DURING WORKS</p> <ol style="list-style-type: none">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.
<p>POST WORKS</p> <ol style="list-style-type: none">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.