



# Clearing Permit Decision Report

## 1. Application details

### 1.1. Permit application details

Permit application No.: 8207/1  
Permit type: Purpose Permit

### 1.2. Proponent details

Proponent's name: **AWE Perth Pty Ltd**

### 1.3. Property details

Property: Production Licences L 4 and L 5  
Local Government Area: Shire of Carnamah  
Colloquial name: Woodada Project

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
15		Mechanical Removal	Maintenance of Petroleum Production Infrastructure and Associated Activities

### 1.5. Decision on application

Decision on Permit Application: Grant  
Decision Date: 6 December 2018

## 2. Site Information

### 2.1. Existing environment and information

#### 2.1.1. Description of the native vegetation under application

**Vegetation Description** The vegetation of the application area is broadly mapped as the following Beard vegetation association: 378: Shrublands; scrub-heath with scattered *Banksia* spp, *Eucalyptus todtiana* & *Xylomelum angustifolium* on deep sandy flats in the Geraldton Sandplain Region (GIS Database).

The following vegetation types have previously been identified within the application area:

1. Open Woodland of *Eucalyptus erythrocorys* over mixed shrubs including *Acacia spathulifolia*, *Melaleuca systema* and *Desmocladius asper* on brown sand with limestone outcropping;
2. Heath dominated by *Banksia attenuata* and *Melaleuca leuropoma* with emergent *Banksia prionotes*, *Banksia menziesii* and *Eucalyptus todtiana* on yellow sand;
3. Heath of mixed myrtaceous species and sedges including *Ecdeicola monostachya* and *Mesomelaena pseudostygia* on grey sand;
4. Open Woodland of *Banksia prionotes* over *Scholtzia laxiflora*, *Melaleuca leuropoma* and *Banksia leptophylla* on yellow sand; and
5. Low forest of *Eucalyptus camaldulensis*, *Casuarina obesa* and *Melaleuca preissiana* over *Hakea preissii* over predominately introduced herbs (AWE, 2009).

Twenty-seven alien weed species have previously been recorded within the application area: Cape Weed (*Arctotheca calendula*), Maltese cockspur (*Centaurea melitensis*), Stinkwort (*Dittrichia graveolens*), Flat Weed (*Hypochaeris radicata*), Rough Sowthistle (*Sonchus asper*), Common Sowthistle (*Sonchus oleraceus*), Ursinia (*Ursinia anthemoides*), Paterson's curse (*Echium plantagineum*), London Rocket (*Sisymbrium irio*), Geraldton Carnation Weed (*Euphorbia terracina*), Common Centaury (*Centaureum erythraea*), Medic (*Medicago* sp.), Hare's Foot Clover (*Trifolium arvense*), Hairgrass (*Aira* sp.), Bearded Oat (*Avena barbata*), Blowfly Grass (*Briza maxima*), Shivery Grass (*Briza minor*), Brome (*Bromus* sp.), Burrgrass (*Cenchrus echinatus*), Couch (*Cynodon dactylon*), Perennial Veldt Grass (*Ehrharta calycina*), Barley Grass (*Hordeum leporinum*), Hare's Tail Grass (*Lagurus ovatus*), Ryegrass (*Lolium* sp.), Pimpernel (*Anagallis arvensis*), Bartsia (*Parentucellia* sp.), and Black Berry Nightshade (*Solanum nigrum*) (Mattiske Consulting Pty Ltd, 2004).

**Clearing Description** Woodada Project.  
AWE Perth Pty Ltd proposes to clear up to 15 hectares of native vegetation within a boundary of approximately 3,698 hectares, for the purpose of maintenance of petroleum production activities. The project is located approximately 9 kilometres west of Eneabba, within the Shire of Carnamah

**Vegetation Condition** Pristine: No obvious signs of disturbance (Keighery, 1994);  
To  
Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).

**Comment**

The vegetation condition was derived from a vegetation survey conducted by Mattiske Consulting Pty Ltd (2004) and via aerial imagery (GIS Database).

The proposal area was formerly partially covered by clearing permit CPS 3318/4 which expired on 30 September 2018. CPS 8207/1 is proposed to replace CPS 3318/4 for the purpose of maintenance of petroleum production activities. If maintenance activities cannot be carried out, there is the potential for it to lead to greater impacts to the local environment.

### 3. Assessment of application against Clearing Principles

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

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

The clearing permit application area is located within the Lesueur Sandplains (GS3) subregion of the Geraldton Sandplain Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). This sub-region is comprised of coastal Aeolian and limestones, Jurassic siltstones and sandstones of the central Perth Basin (CALM, 2002). There are extensive yellow sandplains in the south-eastern parts and shrub-heaths rich in endemics occur on a mosaic of lateritic mesas, sandplains, coastal sands and limestones (CALM, 2002).

The Lesueur Sandplains bioregion contains a high proportion of endemic plants with over 250 plants endemic to the subregion (CALM, 2002). The area is recognised Australia-wide and internationally as having particularly high floristic diversity, with an area of 10 square metres supporting up to 80 different species. The level of threat faced is similar to that of the Avon Wheatbelt, but the reserve system is more representative (CALM, 2002). The main threatening processes to the region are feral animals, grazing pressures, changing fire regimes, increasing land fragmentation, exotic weeds and changes to hydrology (ANRA, 2018).

Twenty-seven alien weed species were recorded within the application area (ARC Energy, 2006). These were Cape Weed (*Arctotheca calendula*), Maltese cockspur (*Centaurea melitensis*), Stinkwort (*Dittrichia graveolens*), Flat Weed (*Hypochaeris radicata*), Rough Sowthistle (*Sonchus asper*), Common Sowthistle (*Sonchus oleraceus*), Ursinia (*Ursinia anthemoides*), Paterson's curse (*Echium plantagineum*), London Rocket (*Sisymbrium irio*), Geraldton Carnation Weed (*Euphorbia terracina*), Common Centaury (*Centaureum erythraea*), Medic (*Medicago* sp.), Hare's Foot Clover (*Trifolium arvense*), Hairgrass (*Aira* sp.), Bearded Oat (*Avena barbata*), Blowfly Grass (*Briza maxima*), Shivery Grass (*Briza minor*), Brome (*Bromus* sp.), Burrgrass (*Cenchrus echinatus*), Couch (*Cynodon dactylon*), Perennial Veldt Grass (*Ehrharta calycina*), Barley Grass (*Hordeum leporinum*), Hare's Tail Grass (*Lagurus ovatus*), Ryegrass (*Lolium* sp.), Pimpernel (*Anagallis arvensis*), Bartsia (*Parentucellia* sp.), and Black Berry Nightshade (*Solanum nigrum*) (Mattiske Consulting Pty Ltd, 2004).

Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. This in turn can lead to greater rates of infestation and further loss of biodiversity if the area is subject to repeated fires. One of these species (*Echium plantagineum*) is listed as a 'Declared Plant' species under the *Agriculture and Related Resources Protection Act 1976* by the Department of Primary Industries and Regional Development (DPIRD). This species is a Priority 1 species and therefore the movement of this plant or its seeds within the state is prohibited, as is the movement of contaminated machinery and produce including livestock and fodder (DPIRD, 2018). Should a clearing permit be granted, it is recommended that a condition be imposed for the purposes of weed management.

The application area is located within a *Phytophthora cinnamomi* dieback risk area. The disease has previously been isolated from some areas within the Gas Field, with these areas displaying disease symptoms indicative of *Phytophthora cinnamomi* infestation (Glevan Consulting, 2004). Should the permit be granted, it is recommended that appropriate conditions be imposed on the permit for the purpose of dieback management.

An area search of the Department of Parks and Wildlife's online fauna database conducted by the assessing officer suggests that the application area is diverse in avian, reptile and invertebrate species (DPaW, 2018). The database search found 51 reptile, 157 avian and 375 invertebrate species as potentially occurring within the application area, or within a 20 kilometre radius of the application area.

The proposed clearing consists of mostly previously cleared areas. Therefore the biodiversity values of the vegetation proposed to be cleared have been significantly reduced. The vegetation communities within the application area are not likely to be considered as rare, geographically restricted or of significant conservation value.

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

**Methodology**

ANRA (2018)  
ARC Energy (2006)  
CALM (2002)  
DPaW (2018)  
DPIRD (2018)  
Glevan Consulting (2004)

GIS Database:

- IBRA Australia
- Pre-European Vegetation
- Threatened and Priority Flora
- Threatened and Priority Ecological Communities Boundaries
- Threatened and Priority Ecological Communities Buffers
- Threatened Fauna

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

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

The assessing officer has conducted a search of the Department of Parks and Wildlife's (DPaW) online fauna database between the coordinates 115.4489°E, 29.5625°S and 114.8666°E, 30.0960°S, representing a 20 kilometre radius around the application area.

This search identified 7 Amphibian, 20 Mammalian, 51 Reptilian, 157 Avian and 375 Invertebrate species that may occur within the application area (DPaW, 2018). Of these, the following species of conservation significance have previously been recorded within the search area:

**Threatened:** *Calidris ferruginea* (Curlew Sandpiper); *Calyptorhynchus latirostris* (Carnaby's Cockatoo); *Egernia stokesii subsp. Badia* (Western Spiny-tailed Skink); *Idiosoma nigrum* (Shield-backed Trapdoor Spider); and *Macroderma gigas* (Ghost Bat).

**Priority 2:** *Hemisaga vepreculae* (thorny bush katydid).

**Priority 3:** *Neelaps calonotos* (Black-striped Snake).

**Priority 4:** *Oxyura australis* (Blue-billed Duck); *Thinornis rubricollis* (Hooded Plover); *Tringa brevipes* (Grey-tailed Tattler).

Lake Logue is recognised as a significant bird habitat (in particular for Carnaby's Black Cockatoo) as it provides breeding habitat when water is present (ARC Energy, 2006; AWE, 2009). As the vegetation to be cleared is to maintain cleared areas around established petroleum assets (well sites, flowlines, access tracks and plant), fringing on the cleared parts of the nature reserve it is unlikely that the fauna habitats that are to be impacted within the application area are considered as necessary for the on-going maintenance of any significant fauna habitat. It is likely that equal or higher quality vegetation and fauna habitats would exist throughout the surrounding area.

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

**Methodology DPaW (2018)**

GIS Database:

- Imagery
- Pre-European Vegetation
- Threatened Fauna

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

**Comments Proposal is at variance to this Principle**

Woodman Environmental Consultants have previously collected *Eremophila glabra subsp. green* flowers (E.A. Griffin 5347) which was previously deemed as not conservation significant taxa within Woodada 11 & 19 well sites. This taxon is now more recently known as *Eremophila glabra subsp. chlorella* (Gand.) Chinnock which is now a Threatened Taxa (AWE Perth Pty Ltd, 2018; Western Australian Herbarium, 1998–).

It is thought this taxon is more likely to be present in areas of disturbance and soils with high moisture content such as the Woodada-19 and Woodada-11 well sites.

Prior to clearing in these areas (or other high moisture content areas), the proponent proposes to inspect the local population to be impacted and provide a determination of the local impact to any population. Where impact cannot be avoided, a Permit to Take Declared Rare Flora pursuant to Section 23F of the Biodiversity Conservation Act 2016 would be in place.

There is the potential for other Threatened flora to occur within the broader application area, however due to the proposed works being for the maintenance of cleared areas around established petroleum assets, it is considered unlikely that these species would be impacted.

Based on the above, the proposed clearing is at variance to this Principle. To further minimise potential impacts to Threatened flora, it is recommended that a flora management condition be implemented.

**Methodology** AWE Perth Pty Ltd (2018)  
Western Australian Herbarium (1998–)

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

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

A search of available databases reveals that there are no Threatened Ecological Communities (TEC's) within the application area (GIS Database).

The nearest (TEC) is located approximately 10 kilometres south-east of the application area (Ferricrete floristic community). At this distance there is little likelihood of any impact to the TEC from the proposed clearing.

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

**Methodology** GIS Database:  
- Threatened and Priority Ecological Communities Boundaries  
- Threatened and Priority Ecological Communities Buffers

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

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

The application area falls within the Geraldton Sandplains Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 44.78% of the pre-European vegetation still exists in the IBRA Geraldton Sandplains Bioregion (Government of Western Australia, 2018). The application area is broadly mapped as Beard vegetation association 378: Shrublands; scrub-heath with scattered *Banksia* spp, *Eucalyptus todtiana* & *Xylomelum angustifolium* on deep sandy flats in the Geraldton Sandplain Region (GIS Database). Approximately 64.17% of the pre-European extent of each of these vegetation associations remains uncleared at both the state and bioregional level (Government of Western Australia, 2018).

Therefore, the application area does not represent a significant remnant of native vegetation in an area that has been extensively cleared.

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in DBCA managed lands
IBRA Bioregion – Geraldton Sandplains	3,136,038	1,404,431	~44.78	Depleted	18.24
Beard vegetation associations – WA					
378	95,109	61,032	~64.17	Least Concern	14.14
Beard vegetation associations – Geraldton Sandplains Bioregion					
378	95,109	61,032	~64.17	Least Concern	14.14

\* Government of Western Australia (2018)

\*\* Department of Natural Resources and Environment (2002)

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

**Methodology** Department of Natural Resources and Environment (2002)  
Government of Western Australia (2018)

GIS Database:  
- IBRA Australia  
- Pre-European Vegetation

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

**Comments**

**Proposal is at variance to this Principle**

According to available databases there are several lakes within the application area including Lake Logue, which is listed in the Directory of Important Wetlands (GIS Database). Lake Logue is the largest feature of the Lake Logue-Indoon System, which includes a number of shallow seasonal wetlands and intermittent creeks and drainage lines. Lake Logue has a surface area of 425 hectares and fills only occasionally, following heavy rain in the catchment. The lake is fed by fresh surface water and has been known to reach a depth of over two metres. When dry, approximately three quarters of its bed is covered by low grasses and shrubs. It is recommended that a restricted clearing condition be implemented to minimise potential impacts to the Lake Logue-Indoon System.

According to available GIS Databases, there are no permanent watercourses within the application area, however, there are several minor, non-perennial watercourses within the application area (GIS Database). The application area contains various small channels and creeks, and after exceptional rainfall these drainage flows may cause temporary flooding (GIS Database; AWE, 2009; ARC Energy, 2006). However the permeable nature of the soils within the application area tends to allow rainwater to percolate vertically to the water table rather than running laterally off the surface (ARC Energy, 2006).

One of the five vegetation associations found within the application area is associated with drainage areas (AWE, 2009; ARC Energy, 2006);

- Low forest of *Eucalyptus camaldulensis*, *Casuarina obesa* and *Melaleuca preissiana* over *Hakea preissii* over predominantly introduced herbs.

This vegetation type occurs around the edge of the wetter areas or in the shallower lakes (ARC Energy, 2006). The vegetation communities growing in association with the watercourses are not unique and are considered common and widespread in the Geraldton Sandplains bioregion (Government of Western Australia, 2018); GIS Database). The proposed clearing is unlikely to significantly impact on vegetation communities growing in association with these drainage channels.

Based on the above, the proposed clearing is at variance to this Principle. However, the clearing of 15 hectares of vegetation is unlikely to have a significant impact on the wetlands and watercourses, or the extent of the vegetation communities within the application area, or local area.

**Methodology**

ARC Energy (2006)  
AWE, 2009  
DEC (2009)  
Government of Western Australia (2018)

GIS Database:

- Hydrography, Lakes
- Hydrography, linear

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

**Comments**

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

The soils within the application area are light, sandy and well-drained (ARC Energy, 2006). These soils consist of calcareous and siliceous sand underlain by aeolianite, which is often exposed (ARC Energy, 2006).

According to available datasets, there are two soil types (CA27 and UB97) within the application area (GIS Database). These soil types are described as:

**CA27** - Sandy plains with occasional pockets of sand dunes, a few small swamps, and stream courses with the chief soils being leached sands, often with a sandy clay substrate between 3 and 6 foot in depth; and

**UB97** - Very gently undulating plains with chief soils being neutral and alkaline yellow mottled soils overlying siliceous pans at depths (Bureau of Rural Sciences, 1992).

Schoknecht (2002) describes these soils as being yellow/brown deep sandy duplexes or yellow/brown shallow sandy duplexes. These have a high risk of wind erodibility and are prone to wind erosion in exposed situations if left bare of surface cover (Schoknecht, 2002).

Based on the above, the proposed clearing may be at variance to this Principle. Impacts of land degradation may be minimised by the implementation of a rehabilitation condition.

**Methodology**

ARC Energy (2006)  
Bureau of Rural Sciences (1992)  
Schoknecht (2002)  
Van Vreeswyk et al. (2004)

GIS Database:  
- Landsystem Rangelands  
- Soils, Statewide

**(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.**

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

The application area occurs within the Lake Logue Nature Reserve (GIS Database).

According to the Australian Heritage Database (Australian Heritage Database, 2018) the Lake Logue Nature Reserve is approximately 4,886 hectares and is a wide shallow valley which is flanked on the west coastal limestone ridges and a high ridge of Mesozoic sandstone and shale on the east. The deep sand of the Lake Logue Nature Reserve supports rich heath which is dominated by *Banksia*, Myrtle, Legume and Wattle species (Australian Heritage Database, 2009).

The Lake Logue Nature Reserve supports extensive populations of the rare *Banksia elegans* (Conservation Through Reserves Committee, 1974). This species only occasionally sets seed and as such should be preserved for seed source. However records indicate that populations of *B. elegans* have previously been recorded from 3 IBRA Bioregions (Western Australian Herbarium, 1998 -) and this species is known to have a range of approximately 180 kilometres with it being recorded from between Hill River and Geraldton (Woodman Environmental Consulting, 2009).

Based on the above, the proposed clearing may be at variance to this Principle. However, despite the area being on the Register of National Estate for natural values, it is considered that the clearing to take place is low impact and of a small scale due to being for the maintenance of petroleum production activities, and subsequently will not significantly impact on the environmental values of the Lake Logue Nature Reserve.

**Methodology** Australian Heritage Database (2018)  
Western Australian Herbarium (1998 -)  
Woodman Environmental Consulting (2009)

GIS Database:  
- DPaW Tenure  
- Clearing Regulations – Environmentally Sensitive Areas

**(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.**

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

According to available databases, the application area is not located within a Public Drinking Water Source Area (PDWSA) (GIS Database).

The groundwater salinity within the application area is approximately 1,000 - 3,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). Given the size of the area to be cleared (15 hectares) compared to the size of the Perth Groundwater Province (4,660,027 hectares) (GIS Database), the proposed clearing is not likely to cause salinity levels within the application area to alter significantly.

There are several known groundwater dependent ecosystems within the application area (GIS Database). Given the small size and nature of the proposed clearing it is unlikely to alter the water table or salinity levels within the application area. Therefore the proposed clearing is unlikely to significantly impact upon the groundwater dependent ecosystems within the application area.

Various small drainage channels exist within the application area, which following exceptional rainfall may cause temporary flooding (ARC Energy, 2006; GIS Database). However the permeable nature of the soils within the application area tends to allow rainwater to percolate vertically to the water table rather than running laterally off the surface (ARC Energy, 2006). Therefore the proposed clearing is unlikely to significantly impact upon the quality of the surface water within the application area.

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

**Methodology** ARC Energy (2006)

GIS Database:  
- Hydrography, Linear  
- Public Drinking Water Source Areas

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

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

The application area experiences a Mediterranean climate with an average annual rainfall of 503.9 millimetres recorded from the nearest weather station at Eneabba approximately 9 kilometres east of the application area (CALM, 2002; BoM, 2018).

Various small drainage channels exist which flow into Stockyard Gully Cave and Lake Logue and following exceptional rainfall these drainage flows may cause extensive flooding (ARC Energy, 2006; GIS Database). However the permeable nature of the soils within the application area tends to allow rainwater to percolate vertically to the water table rather than running laterally off the surface (ARC Energy, 2006).

The application area is located within the Indoon Logue catchment area (GIS Database). However, the small area to be cleared (15 hectares) in relation to the size of the Indoon Logue catchment area (137,421 hectares) (GIS Database) is not likely to increase the potential for flooding within the application area, local area or within the catchment (GIS Database).

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

**Methodology** ARC Energy (2006)  
BOM (2018)  
Van Vreeswyk et al. (2004)

GIS Database:  
- Hydrographic Catchments - Catchments  
- Hydrography, linear

**Planning Instrument, Native Title, previous EPA decision or other matter.**

**Comments**

The clearing permit application was advertised on 29 October 2018 by the Department of Mines, Industry Regulation and Safety (DMIRS), inviting submissions from the public. There was 12 submissions received in relation to this application with concerns raised about potential impacts to the Lake Logue Nature Reserve. The concerns raised have been considered in the assessment under Principles F and H, and it has been recommended that a restricted clearing condition be implemented to minimise potential impacts to the Lake Logue Nature Reserve.

There are two native title claim/s over the area under application (DPLH, 2018). These claims have been registered with the National Native Title Tribunal on behalf of the claimant groups. However, the mining tenure has been granted in accordance with the future act regime of the *Native Title Act 1993* and the nature of the act (i.e. the proposed clearing activity) has been provided for in that process, therefore, the granting of a clearing permit is not a future act under the *Native Title Act 1993*.

There are two registered Aboriginal Sites of Significance within the application area (DPLH, 2018). It is the proponent's responsibility to comply with the *Aboriginal Heritage Act 1972* and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

It is the proponent's responsibility to liaise with the Department of Water and Environmental Regulation and the Department of Biodiversity Conservation and Attractions, to determine whether a Works Approval, Water Licence, Bed and Banks Permit, or any other licences or approvals are required for the proposed works.

**Methodology** DPLH (2018)

**4. References**

- ANRA (2018) Australian Natural Resources Atlas - Biodiversity Assessment - Geraldton Sandplains. <https://data.gov.au/dataset/australian-natural-resources-atlas-anra> (Accessed archive page on 3 December 2018)
- ARC Energy (2006) Woodada Gas Field Environmental Management Plan - Production Licence L4/L5. Unpublished Report dated 19 May 2006.
- AWE (2009) Woodada Gas Field Clearing Permit Application. Supporting Documentation. Australian Worldwide Exploration Limited, Western Australia.
- Australian Heritage Database (2018) Lake Logue Nature Reserve <http://www.environment.gov.au> (Accessed 3 December 2018).
- AWE (2018) Woodada Gas Field Clearing Permit Application. Supporting Documentation. AWE Perth Pty Ltd. September 2018.
- BoM (2018) Bureau of Meteorology Website – Climate Data Online, Weather Station Name. Bureau of Meteorology. <http://www.bom.gov.au/climate/data/> (Accessed 3 December 2018).
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, Western Australia.

- DEC (2009). *Resource Condition Report for a Significant Western Australian Wetland: Lake Logue*. Department of Environment and Conservation, Perth.
- DPaW (2018) NatureMap, Mapping Western Australia's Biodiversity, Department of Parks and Wildlife. <https://naturemap.dpaw.wa.gov.au/> (Accessed 3 December 2018).
- DPLH (2018) Aboriginal Heritage Enquiry System. Department of Planning, Lands and Heritage. <http://maps.daa.wa.gov.au/AHIS/> (Accessed 3 December 2018).
- DPIRD (2018) Department of Primary Industries and Regional Development <https://www.agric.wa.gov.au/pests-weeds-diseases/weeds/declared-plants> (Accessed 3 December 2018).
- 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.
- Glevan Consulting (2004) *Phytophthora cinnamomi - Management recommendations - Woodada Gas Field*. Unpublished Report Prepared for Australian Worldwide Exploration, dated May 2004.
- Government of Western Australia (2018) 2017 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of December 2017. WA Department of Biodiversity, Conservation and Attractions. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>
- Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Schoknecht N. (2002) *Soil Groups of Western Australia. A simple guide to the main soils of Western Australia*. Resource Management Technical Report 246. Edition 3
- Van Vreeswyk, A.M.E., Payne, A.L., Hennig, P., and Leighton, K.A. (2004) *An Inventory and Condition Survey of the Pilbara Region, Western Australia*. Department of Agriculture, Western Australia.
- Western Australian Herbarium (1998 -). *FloraBase - the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions. <https://florabase.dpaw.wa.gov.au/> (Accessed 3 December 2018).
- Woodman Environmental Consulting (2009) *Australian Worldwide Exploration Woodada-20-Drill Site Flora and Vegetation Assessment*. Unpublished Report Prepared for Australian Worldwide Exploration, dated February 2009.

## 5. Glossary

### Acronyms:

<b>BoM</b>	Bureau of Meteorology, Australian Government
<b>DAA</b>	Department of Aboriginal Affairs, Western Australia (now DPLH)
<b>DAFWA</b>	Department of Agriculture and Food, Western Australia (now DPIRD)
<b>DBCA</b>	Department of Biodiversity Conservation and Attractions, Western Australia
<b>DEC</b>	Department of Environment and Conservation, Western Australia (now DBCA and DWER)
<b>DEE</b>	Department of the Environment and Energy, Australian Government
<b>DER</b>	Department of Environment Regulation, Western Australia (now DWER)
<b>DMIRS</b>	Department of Mines, Industry Regulation and Safety, Western Australia
<b>DMP</b>	Department of Mines and Petroleum, Western Australia (now DMIRS)
<b>DPIRD</b>	Department of Primary Industries and Regional Development, Western Australia
<b>DPLH</b>	Department of Planning, Lands and Heritage, Western Australia
<b>DRF</b>	Declared Rare Flora
<b>DoE</b>	Department of the Environment, Australian Government (now DEE)
<b>DoW</b>	Department of Water, Western Australia (now DWER)
<b>DPaW</b>	Department of Parks and Wildlife, Western Australia (now DBCA)
<b>DSEWPac</b>	Department of Sustainability, Environment, Water, Population and Communities (now DEE)
<b>DWER</b>	Department of Water and Environmental Regulation, Western Australia
<b>EPA</b>	Environmental Protection Authority, Western Australia
<b>EP Act</b>	<i>Environmental Protection Act 1986</i> , Western Australia
<b>EPBC Act</b>	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Federal Act)
<b>GIS</b>	Geographical Information System
<b>ha</b>	Hectare (10,000 square metres)
<b>IBRA</b>	Interim Biogeographic Regionalisation for Australia
<b>IUCN</b>	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
<b>PEC</b>	Priority Ecological Community, Western Australia
<b>RIWI Act</b>	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
<b>TEC</b>	Threatened Ecological Community

### Definitions:

{DPaW (2017) *Conservation Codes for Western Australian Flora and Fauna*. Department of Parks and Wildlife, Western Australia}:-



- T**                    **Threatened species:**  
Published as Specially Protected under the *Wildlife Conservation Act 1950*, listed under Schedules 1 to 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora (which may also be referred to as Declared Rare Flora).  
**Threatened fauna** is that subset of 'Specially Protected Fauna' declared to be 'likely to become extinct' pursuant to section 14(4) of the *Wildlife Conservation Act 1950*.  
**Threatened flora** is flora that has been declared to be 'likely to become extinct or is rare, or otherwise in need of special protection', pursuant to section 23F(2) of the *Wildlife Conservation Act 1950*.  
The assessment of the conservation status of these species is based on their national extent and ranked according to their level of threat using IUCN Red List categories and criteria as detailed below.
- CR**                    **Critically endangered species**  
Threatened species considered to be facing an extremely high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 1 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.
- EN**                    **Endangered species**  
Threatened species considered to be facing a very high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 2 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.
- VU**                    **Vulnerable species**  
Threatened species considered to be facing a high risk of extinction in the wild. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 3 of the Wildlife Conservation (Specially Protected Fauna) Notice for Threatened Fauna and Wildlife Conservation (Rare Flora) Notice for Threatened Flora.
- EX**                    **Presumed extinct species**  
Species which have been adequately searched for and there is no reasonable doubt that the last individual has died. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 4 of the Wildlife Conservation (Specially Protected Fauna) Notice for Presumed Extinct Fauna and Wildlife Conservation (Rare Flora) Notice for Presumed Extinct Flora.
- IA**                    **Migratory birds protected under an international agreement**  
Birds that are subject to an agreement between the government of Australia and the governments of Japan (JAMBA), China (CAMBA) and The Republic of Korea (ROKAMBA), and the Bonn Convention, relating to the protection of migratory birds. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 5 of the Wildlife Conservation (Specially Protected Fauna) Notice.
- CD**                    **Conservation dependent fauna**  
Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 6 of the Wildlife Conservation (Specially Protected Fauna) Notice.
- OS**                    **Other specially protected fauna**  
Fauna otherwise in need of special protection to ensure their conservation. Published as Specially Protected under the *Wildlife Conservation Act 1950*, in Schedule 7 of the Wildlife Conservation (Specially Protected Fauna) Notice.
- P**                        **Priority species**  
Species which are poorly known; or  
Species that are adequately known, are rare but not threatened, and require regular monitoring. Assessment of Priority codes is based on the Western Australian distribution of the species, unless the distribution in WA is part of a contiguous population extending into adjacent States, as defined by the known spread of locations.
- P1**                    **Priority One - Poorly-known species:**  
Species that are known from one or a few locations (generally five or less) which are potentially at risk. All occurrences are either: very small; or on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, road and rail reserves, gravel reserves and active mineral leases; or otherwise under threat of habitat destruction or degradation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under immediate threat from known threatening processes. Such species are in urgent need of further survey.
- P2**                    **Priority Two - Poorly-known species:**

Species that are known from one or a few locations (generally five or less), some of which are on lands managed primarily for nature conservation, e.g. national parks, conservation parks, nature reserves and other lands with secure tenure being managed for conservation. Species may be included if they are comparatively well known from one or more locations but do not meet adequacy of survey requirements and appear to be under threat from known threatening processes. Such species are in urgent need of further survey.

**P3 Priority Three - Poorly-known species:**

Species that are known from several locations, and the species does not appear to be under imminent threat, or from few but widespread locations with either large population size or significant remaining areas of apparently suitable habitat, much of it not under imminent threat. Species may be included if they are comparatively well known from several locations but do not meet adequacy of survey requirements and known threatening processes exist that could affect them. Such species are in need of further survey.

**P4 Priority Four - Rare, Near Threatened and other species in need of monitoring:**

(a) Rare. Species that are considered to have been adequately surveyed, or for which sufficient knowledge is available, and that are considered not currently threatened or in need of special protection, but could be if present circumstances change. These species are usually represented on conservation lands.

(b) Near Threatened. Species that are considered to have been adequately surveyed and that are close to qualifying for Vulnerable, but are not listed as Conservation Dependent.

(c) Species that have been removed from the list of threatened species during the past five years for reasons other than taxonomy.