



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 3748/2
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Argyle Diamonds Ltd

1.3. Property details

Property: Diamond (Argyle Diamond Mines Joint Venture) Agreement Act 1981, Mining Lease 259SA (AM 70/259)
Local Government Area: Shire of Wyndham-East Kimberley
Colloquial name: Water Pipeline Replacement Works

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
35		Mechanical Removal	Water Pipeline Replacement

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 7 April 2011

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description Beard vegetation associations have been mapped at a 1:250,000 scale for the whole of Western Australia. Two Beard vegetation associations have been mapped within the application area (GIS Database; Shepherd, 2009).

819: Grasslands, tall bunch grass savanna low tree; cabbage gum and silver leafed box over *Aristida* and ribbon grass on sandy plains; and

833: Grasslands, short bunch grass savanna sparse low tree; scattered snappy gum over arid short grass on plains (GIS Database; Shepherd, 2009).

The application area was surveyed by Mattiske Consulting in March 2004 (Mattiske Consulting Pty Ltd, 2004). The following vegetation types were identified within the application area:

Hummock Grasslands

HG1: Hummock grassland of *Triodia bitextura* and *Triodia bynoei* with emergent *Eucalyptus brevifolia*, *Corymbia confertiflora*, *Corymbia opaca*, *Eucalyptus pruinosa*, *Bauhinia cunninghamii* over *Acacia argyraea* and *Acacia hemignosta*;

HG2: Hummock grassland of *Triodia bitextura* and *Triodia bynoei* with emergent *Corymbia confertiflora*, *Corymbia opaca*, *Eucalyptus brevifolia*, *Eucalyptus pruinosa*, *Bauhinia cunninghamii* and *Terminalia canescens*;

HG3: Hummock grassland of *Triodia bitextura* and *Triodia bynoei* with emergent denser pockets of *Terminalia canescens* and *Cochlospermum fraseri*, with the occasional *Corymbia confertiflora* and *Eucalyptus brevifolia*;

Woodlands

W1: Low open woodland of *Terminalia canescens* with *Corymbia confertiflora*, *Eucalyptus brevifolia*, *Terminalia oblongata* subsp. *volucris* and *Eucalyptus pruinosa* over patches of *Triodia bitextura* and *Heteropogon contortus*;

W2: Low open woodland of *Melaleuca minutifolia* and *Eucalyptus pruinosa* over *Triodia bitextura*;

W3: Low open woodland of *Eucalyptus brevifolia* over pockets of *Acacia argyraea* and *Eriachne ciliata*;

W4: Open woodland and low open woodland of *Terminalia platyptera*, *Terminalia arostrata*, *Adansonia gregorii*, *Buchanania obovata* and *Bauhinia cunninghamii*;

W5: Mixture of open woodland and low open woodland of *Adansonia gregorii*, *Buchanania obovata*, *Bauhinia cunninghamii* and *Eucalyptus brevifolia* over patches of *Typha domingensis*, *Heteropogon contortus*, *Cenchrus elymoides* and *Chloris truncata*;

W6: Low open woodland of *Melaleuca minutifolia* over patches of *Typha domingensis*;

- W7:** Low open woodland of *Bauhinia cunninghamii* and *Eucalyptus pruinosa* over mixed grasses and herbs;
- W8:** Low woodland of *Cochlospermum fraseri*, *Eucalyptus brevifolia*, *Eucalyptus pruinosa* and *Corymbia opaca* over *Triodia bitextura* and *Cyperus cunninghamii* subsp. *cunninghamii*;
- W9:** Low open woodland of *Corymbia opaca*, *Eucalyptus brevifolia*, *Eucalyptus pruinosa* and *Cochlospermum fraseri* over *Ptilotus spicatus* subsp. *spicatus*, *Cleome viscosa* and *Phyllanthus maderaspatensis* var. *angustifolius*;

Sedgelands

- S1:** Sedgelands of *Typha domingensis* with emergent *Adansonia gregorii*, *Melaleuca viridiflora* and *Lophostemon grandiflorus* subsp. *riparius* (Mattiske Consulting Pty Ltd, 2004).

Clearing Description	Argyle Diamonds Ltd is proposing to clear up to 35 hectares of native vegetation to undertake pipeline replacement works (Argyle Diamonds Ltd, 2010). The pipeline replacement project will involve replacing the Gap Dam Raw Water Pipeline (approximately 3.2 kilometres) and the Potable Water Pipeline (approximately 8.4 kilometres). The new pipelines will be laid above ground and will require a maintenance corridor on either side for fire breaks and to eliminate vegetation growing into the pipeline (Argyle Diamonds Ltd, 2010).
Vegetation Condition	Good: Structure significantly altered by multiple disturbance; retains basic structure/ability to regenerate (Keighery, 1994).
Comment	The application area is located in the Eastern Kimberley region, approximately 106.5 kilometres south-west of Kununurra. The vegetation condition was derived from a vegetation survey conducted by Mattiske Consulting Pty Ltd (2004).
	Clearing permit CPS 3748/1 was granted by the Department of Mines and Petroleum on 22 July 2010, and is valid from 21 August 2010 to 31 May 2015. The clearing permit authorised the clearing of 35 hectares of native vegetation. An application for an amendment to clearing permit CPS 3748/1 was submitted by Argyle Diamonds Ltd on 25 January 2011. The proponent has requested to change the reporting due date to 30 September. There were no additional environmental impacts as a result of this amendment.

3. Assessment of application against clearing principles

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

Comments	<p>Proposal may be at variance to this Principle</p> <p>The Argyle Diamond Mine is situated approximately 200 kilometres south-west of Kununurra (by road) within the Ord (OVP1) subregion of the Ord Victoria Plains Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). This subregion is characterised by level to gently undulating plains with scattered hills on Cambrian volcanic and Proterozoic sedimentary rocks; vertosols on plains and predominantly skeletal soils on hills (CALM, 2002). The overall vegetation is grassland with scattered bloodwoods (<i>Corymbia</i> spp.) and snappy gum (<i>Eucalyptus brevifolia</i>) with spinifex and annual grasses (CALM, 2002).</p> <p>The Australian Natural Resources Atlas (ANRA) (2008) notes that the Ord Victoria Plains bioregion includes a blend of biota from arid environments and high rainfall areas. It is noted that the Argyle lease area is located in the Northern Botanical District, near the point where three of the four Kimberley Botanical Districts meet (Argyle Diamonds Ltd, 2008). A very high diversity and abundance of granivorous birds are present in the bioregion. This is likely to be a reflection of the numerous grass species present in the area. Pastoral practices, weeds, feral animals and changed fire regimes are identified as being the most influential factors affecting biodiversity of the bioregion (ANRA, 2008).</p> <p>A fauna review of the Argyle lease area was undertaken by Bamford Consulting Ecologists (2005) in January 2005. The review concluded that the Argyle area is rich in reptile, amphibian and avifauna, with an abundance of waterbirds drawn to the natural riverine systems and artificial water sources associated with the mining operation. A large number of conservation significant species (41) have previously been recorded from the lease area, with 29 of these being migratory bird species.</p> <p>At a local scale, the Argyle Diamond Mine is likely to have had some impact on biodiversity. An estimated 900 hectares of native vegetation has been progressively cleared for existing waste rock dumps and open pit, with a further 300 - 350 hectares for the AK1 Tailings Storage Facility (Argyle Diamonds Ltd, 2006). Accommodation camps, roads and other mining-related infrastructure have also required native vegetation clearing since the mine began operating in 1982. Additional impacts to biodiversity from the proposed clearing for pipeline replacement works are not likely to be significant in a regional context.</p> <p>Thirteen alien weed species were recorded within the vegetation survey area (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. Potential impacts to biodiversity as a result of the proposed clearing may be minimised by the implementation of a weed management condition.</p>
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Based on the above, the proposed clearing may be at variance to this Principle.

Methodology ANRA (2008)
Argyle Diamonds Ltd (2006)
Argyle Diamonds Ltd (2008)
Bamford Consulting Ecologists (2005)
CALM (2002)
Mattiske Consulting Pty Ltd (2004)
GIS Database:
- IBRA (Regions - Subregions)

(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

Numerous fauna surveys have been undertaken at the Argyle Diamond Mine lease area, including 1980/1981, 2000 and 2002. In addition, the annual Rio Tinto Bird Watch has been undertaken at Argyle since 2001 and has made an important contribution to understanding the local avifauna of the area (Argyle Diamonds Ltd, 2008).

In 2005, a general review of the local fauna was undertaken by Bamford Consulting Ecologists (2005). As a result of previous surveys at the Argyle lease, 27 mammals, 205 birds, 79 reptiles and 19 amphibians have been recorded. Of these 330 species, 41 are of conservation significance. This includes 29 bird species listed under the Japan-Australia Migratory Bird Agreement (JAMBA) or China-Australia Migratory Bird Agreement (CAMBA), 24 of which are waterbirds (Bamford Consulting Ecologists, 2005).

The Argyle lease area has rich reptile, amphibian and avifauna. A mixture of arid and northern zone species is present. Many of the amphibians and reptiles recorded from the lease area are common to the spinifex and sorghum grasslands found on the alluvial plains of the region (Bamford Consulting Ecologists, 2005). A high number of waterbird species (72) have previously been recorded from the lease area. The existing natural riverine systems of the area and 'man-made' tailings storage facility and numerous water storage dams associated with the mining operation provide suitable habitat for waterbird species (Bamford Consulting Ecologists, 2005).

The native mammal fauna of the Argyle lease is typical of the arid region of the East Kimberley. The distribution and abundance of mammal fauna is highly seasonal, particularly rodents; with many species reaching plague proportions during favourable seasons. Introduced mammal fauna known from the lease area include cats, donkeys and foxes (Argyle Diamonds Ltd, 2008).

According to Shepherd (2009) approximately 99.99% of the pre-European vegetation remains within the Ord Victoria Plain bioregion. Given the extent of native vegetation remaining in the local area and bioregion, the vegetation to be cleared does not represent a significant ecological linkage in a regional context. The size of the proposed clearing (35 hectares) in relation to the size of the Argyle lease area (approximately 182,069 hectares) (GIS Database) and the surrounding uncleared landscape suggests that any potential loss of significant habitat is likely to be low.

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

Methodology Argyle Dimonds Ltd (2008)
Bamford Consulting Ecologists (2005)
Shepherd (2009)
GIS Database:
- Mining Tenements

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

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

According to available GIS databases there are no known records of Declared Rare Flora (DRF) or Priority Flora within the application area (GIS Database). The nearest record of Priority Flora is a population of *Corymbia cadophora* subsp. *polychroma* (P1) located approximately 14 kilometres north-west of the application area (GIS Database).

A flora survey was conducted over the application area by staff from Mattiske Consulting Pty Ltd in March 2004 (Mattiske Consulting Pty Ltd, 2004).

No DRF were recorded within the application area (Mattiske Consulting Pty Ltd, 2004). The previously recorded Priority One species; *Goodenia lunata* was subsequently re-identified as *Goodenia coronopifolia* which is not listed as a Priority or DRF species. This species was recorded in extensive numbers on the low lying slopes and

flats near the creeklines and has now been recorded more extensively over the area in communities GH1, W1, W2, W4 and W7 (Mattiske Consulting Pty Ltd, 2004). The occurrence of large numbers of *Goodenia coronopifolia* plants in 2004 indicates that this species establishment follows regular summer rainfall events (Mattiske Consulting Pty Ltd, 2004).

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

Methodology Mattiske Consulting Pty Ltd (2004)
GIS Database:
- Declared Rare and Priority Flora List

(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 (TECs) within the application area (GIS Database). A search of available databases reveals there are no known TECs within a 200 kilometre radius of the application area (GIS Database).

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

Methodology GIS Database:
- Threatened Ecological Sites Buffered

(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 Ord Victoria Plains IBRA bioregion (GIS Database). Shepherd (2009) reports that approximately 99.99% of the pre-European vegetation remains in this bioregion.

The vegetation within the application area is recorded as Beard vegetation associations:

819: Grasslands, tall bunch grass savanna low tree; cabbage gum and silver leafed box over *Aristida* and ribbon grass on sandy plains; and

833: Grasslands, short bunch grass savanna sparse low tree; scattered snappy gum over arid short grass on plains (GIS Database; Shepherd, 2009).

According to Shepherd (2009) approximately 100% of these Beard vegetation associations remain within the Ord Victoria Plains bioregion (see table below).

	Pre-European area (ha)*	Current extent (ha)*	Remaining %*	Conservation Status**	Pre-European % in IUCN Class I-IV Reserves
IBRA Bioregion - Ord Victoria Plain	5,497,882	5,497,224	~99.99%	Least Concern	~15.98%
Beard vegetation associations - State					
819	58,827	58,827	~100%	Least Concern	N/A
833	38,675	38,675	~100%	Least Concern	N/A
Beard vegetation associations - Bioregion					
819	48,986	48,986	~100%	Least Concern	N/A
833	38,498	38,498	~100%	Least Concern	N/A

* Shepherd (2009)

** 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)
Shepherd (2009)
GIS Database:
- IBRA WA (regions - subregions)

(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 not likely to be at variance to this Principle

According to available GIS Databases, there are numerous ephemeral drainage lines within the application area, as well as Limestone Creek intersecting the application area in two places (GIS Database).

Based on vegetation mapping conducted by Mattiske Consulting Pty Ltd (2004) four of the thirteen vegetation associations found within the application area are associated with drainage areas. These are;

W4: Open woodland and low open woodland of *Terminalia platyptera*, *Terminalia arostrata*, *Adansonia gregorii*, *Buchanania obovata* and *Bauhinia cunninghamii*;

W5: Mixture of open woodland and low open woodland of *Adansonia gregorii*, *Buchanania obovata*, *Bauhinia cunninghamii* and *Eucalyptus brevifolia* over patches of *Typha domingensis*, *Heteropogon contortus*, *Cenchrus elymoides* and *Chloris truncata*;

W6: Low open woodland of *Melaleuca minutifolia* over patches of *Typha domingensis*; and

S1: Sedgeland of *Typha domingensis* with emergent *Adansonia gregorii*, *Melaleuca viridiflora* and *Lophostemon grandiflorus* subsp. *riparius* (Mattiske Consulting Pty Ltd, 2004).

Woodlands on the creek systems are dominated by mixed over storey species including *Adansonia gregorii*, *Buchanania obovata* and *Terminalia platyptera*, over understorey species including *Typha domingensis* and *Heteropogon contortus* (Mattiske Consulting Pty Ltd, 2004). The woodland associations W4 and W5 have both suffered previous disturbance due to stock grazing in the area. While the sedgeland association S1 is entirely dominated by *Typha domingensis*, which is an invasive sedge (Mattiske Consulting Pty Ltd, 2004). The branch of Limestone Creek where the vegetation community S1 was recorded is artificially watered by the mine, which has resulted in the prolific growth of *Typha domingensis*.

The proposed clearing for pipeline replacement works is not likely to significantly impact on the conservation of vegetation growing in association with watercourses. The Department of Water (DoW) advised that while the clearing may impact on Smoke Creek it is unlikely to have a significant impact (DoW, 2010). However, DoW advised that the clearing of riparian vegetation should be minimised and where possible disturbed areas should be rehabilitated prior to the onset of the wet season (DoW, 2010).

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

Methodology DoW (2010)
Mattiske Consulting Pty Ltd (2004)
GIS Database:
- Hydrography - Linear
- Natmap 250K Series Mapping

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

Comments Proposal may be at variance to this Principle

The landscape around the mine is hilly, with gentle foothills and well-defined drainage lines (Argyle Diamonds Ltd, 2010). Mountain and strike ridges dominate the topography across the Lease Areas and the plains are incised with numerous watercourses (Argyle Diamonds Ltd, 2010).

The soils in the lease area vary from skeletal to extensive silt and sandy flats. The area of proposed disturbance can be characterised as lithosols, the soils of this unit being predominantly coarse textured (stoney and rocky), weakly coherent in the moderately moist state and non-calcareous (Argyle Diamonds Ltd, 2010).

According to available GIS Databases, the soils of the application area can be characterised as red and brown shallow porous loamy soils, shallow sandy soils and neutral hard red to alkaline hard yellow mottled soils (GIS Database). These soils have a low to high risk of erosion (Schoknecht, 2002).

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

Methodology Argyle Diamonds Ltd (2010)
Schoknecht (2002)
GIS Database:
- 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 proposed clearing is not located within a conservation reserve (GIS Database). According to available databases the nearest known conservation reserve is located approximately 41.5 kilometres south-east of the application area (GIS Database).

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

Methodology GIS Database:
- DEC Tenure

(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 500-1,000 milligrams/Litre Total Dissolved Solids (TDS) (GIS Database). This is considered to be potable water. Given the size of the area to be cleared (35 hectares) compared to the size of the Halls Creek Groundwater Province (4,600,599 hectares) (GIS Database), the proposed clearing is not likely to cause groundwater salinity levels within the application area to alter significantly.

The application area lies within the Ord River catchment, upstream of Lake Argyle (GIS Database; Argyle Diamonds Ltd, 2010). The application area is traversed by numerous drainage lines which provide for the shedding of water from the hill slopes in the wet season. During the wet season the majority of the drainage empties into the AK1 Tailings Storage Facility or into Gap Creek where any sediments are captured by the sedimentation ponds and is not released into the surrounding environment (Argyle Diamonds Ltd, 2010).

The size and linear nature of the proposed clearing is unlikely to result in significant changes to surface water flows.

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

Methodology Argyle Diamonds Ltd (2010)
GIS Database:
- Groundwater Provinces
- Groundwater Salinity, Statewide
- Hydrographic Catchments - Catchments
- Public Drinking Water Source Areas (PDWSA)

(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 lies within the Ord River catchment, upstream of Lake Argyle (GIS Database; Argyle Diamonds Ltd, 2010). The application area is traversed by numerous drainage lines which provide for the shedding of water from the hill slopes in the wet season. During the wet season the majority of the drainage empties into the AK1 TSF or into Gap Creek where any sediments are captured by the sedimentation ponds and is not released into the surrounding environment (Argyle Diamonds Ltd, 2010).

The size of the area to be cleared (35 hectares) in relation to the size of the Ord River catchment area (4,526,028 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 Argyle Diamonds Ltd (2010)
GIS Database:
- Hydrographic Catchments - Catchments

Planning instrument, Native Title, Previous EPA decision or other matter.

Comments

There are no Native Title Claims over the area under application (GIS Database). 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 numerous registered Aboriginal Sites of Significance within and in close proximity to the application area (GIS Database). 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.

The application area is located within a *Rights in Water and Irrigation Act 1914* (RIWI Act) Groundwater Area (GIS Database). DoW advised the assessing officer that the clearing of 35 hectares is unlikely to have a significant impact on the groundwater area (DoW, 2010).

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

Clearing permit CPS 3748/1 was granted by the Department of Mines and Petroleum on 22 July 2010, and is valid from 21 August 2010 to 31 May 2015. The clearing permit authorised the clearing of 35 hectares of native vegetation. An application for an amendment to clearing permit CPS 3748/1 was submitted by Argyle Diamonds Ltd on 25 January 2011. The proponent has requested to change the reporting due date to 30 September. There were no additional environmental impacts as a result of this amendment.

Methodology DoW (2010)
GIS Database:
- Aboriginal Sites of Significance
- Native Title NNTT
- RIWI - Groundwater Areas

4. References

- Argyle Diamonds Ltd (2006) Clearing Permit Application Supporting Documentation. Unpublished report to DoIR (now DMP). January 2006.
- Argyle Diamonds Ltd (2008) East Ridge Area for New Haul Road: Clearing Application Supporting Documentation. Clearing Permit 2675. September 2008. Unpublished report.
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- Bamford Consulting Ecologists (2005) Review of Terrestrial Vertebrate Fauna of the Argyle Diamond Lease and East Kimberley (including impacts of proposed mine expansion near Limestone Creek). Prepared for Argyle Diamond Mine Pty Ltd. Unpublished report dated January 2005.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographical Subregions. Ord Victoria Plains 1 (OVP1 - Ord Victoria Plains subregion) Department of Conservation and Land Management, 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.
- DoW (2010) Water Quality Advice. Advice to assessing officer, Native Vegetation Assessment Branch, Department of Mines and Petroleum (DMP), received (30 June 2010). Department of Water, Western Australia.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Mattiske Consulting Pty Ltd (2004) Flora and Vegetation Survey Expansion of Waste Dumps and Area Associated with Underground Expansion near Limestone Creek. Prepared for Argyle Diamond Mines Pty Ltd. Unpublished report dated March 2004.
- Schoknecht (2002) Soil Groups of Western Australia: A simple guide to the main soils of Western Australia. Resource Management Technical Report 246.
- Shepherd, D.P. (2009) Adapted from: Shepherd, D.P., Beeston, G.R., and Hopkins, A.J.M. (2001), Native Vegetation in Western Australia. Technical Report 249. Department of Agriculture Western Australia, South Perth.

5. Glossary

Acronyms:

BoM	Bureau of Meteorology, Australian Government
CALM	Department of Conservation and Land Management (now DEC), Western Australia
DAFWA	Department of Agriculture and Food, Western Australia
DEC	Department of Environment and Conservation, Western Australia
DEH	Department of Environment and Heritage (federal based in Canberra) previously Environment Australia
DEP	Department of Environment Protection (now DEC), Western Australia
DIA	Department of Indigenous Affairs
DLI	Department of Land Information, Western Australia
DMP	Department of Mines and Petroleum, Western Australia
DoE	Department of Environment (now DEC), Western Australia
DoIR	Department of Industry and Resources (now DMP), Western Australia
DOLA	Department of Land Administration, Western Australia
DoW	Department of Water
EP Act	Environmental Protection Act 1986, Western Australia
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999 (Federal Act)
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature and Natural Resources – commonly known as the World Conservation Union
RIWI Act	Rights in Water and Irrigation Act 1914, Western Australia
s.17	Section 17 of the Environment Protection Act 1986, Western Australia
TEC	Threatened Ecological Community

Definitions:

{Atkins, K (2005). *Declared rare and priority flora list for Western Australia, 22 February 2005*. Department of Conservation and Land Management, Como, Western Australia} :-

P1	Priority One - Poorly Known taxa: taxa which are known from one or a few (generally <5) populations which are under threat, either due to small population size, or being on lands under immediate threat, e.g. road verges, urban areas, farmland, active mineral leases, etc., or the plants are under threat, e.g. from disease, grazing by feral animals, etc. May include taxa with threatened populations on protected lands. Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P2	Priority Two - Poorly Known taxa: taxa which are known from one or a few (generally <5) populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in urgent need of further survey.
P3	Priority Three - Poorly Known taxa: taxa which are known from several populations, at least some of which are not believed to be under immediate threat (i.e. not currently endangered). Such taxa are under consideration for declaration as 'rare flora', but are in need of further survey.
P4	Priority Four – Rare taxa: taxa which are considered to have been adequately surveyed and which, whilst being rare (in Australia), are not currently threatened by any identifiable factors. These taxa require monitoring every 5–10 years.
R	Declared Rare Flora – Extant taxa (= Threatened Flora = Endangered + Vulnerable): taxa which have been adequately searched for, and are deemed to be in the wild either rare, in danger of extinction, or otherwise in need of special protection, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.
X	Declared Rare Flora - Presumed Extinct taxa: taxa which have not been collected, or otherwise verified, over the past 50 years despite thorough searching, or of which all known wild populations have been destroyed more recently, and have been gazetted as such, following approval by the Minister for the Environment, after recommendation by the State's Endangered Flora Consultative Committee.

{Wildlife Conservation (Specially Protected Fauna) Notice 2005} [Wildlife Conservation Act 1950] :-

Schedule 1	Schedule 1 – Fauna that is rare or likely to become extinct: being fauna that is rare or likely to become extinct, are declared to be fauna that is need of special protection.
Schedule 2	Schedule 2 – Fauna that is presumed to be extinct: being fauna that is presumed to be extinct, are declared to be fauna that is need of special protection.
Schedule 3	Schedule 3 – Birds protected under an international agreement: being birds that are subject to an agreement between the governments of Australia and Japan relating to the protection of migratory birds and birds in danger of extinction, are declared to be fauna that is need of special protection.
Schedule 4	Schedule 4 – Other specially protected fauna: being fauna that is declared to be fauna that is in need of

special protection, otherwise than for the reasons mentioned in Schedules 1, 2 or 3.

{CALM (2005). *Priority Codes for Fauna*. Department of Conservation and Land Management, Como, Western Australia} :-

- P1** **Priority One: Taxa with few, poorly known populations on threatened lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not managed for conservation, e.g. agricultural or pastoral lands, urban areas, active mineral leases. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P2** **Priority Two: Taxa with few, poorly known populations on conservation lands:** Taxa which are known from few specimens or sight records from one or a few localities on lands not under immediate threat of habitat destruction or degradation, e.g. national parks, conservation parks, nature reserves, State forest, vacant Crown land, water reserves, etc. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P3** **Priority Three: Taxa with several, poorly known populations, some on conservation lands:** Taxa which are known from few specimens or sight records from several localities, some of which are on lands not under immediate threat of habitat destruction or degradation. The taxon needs urgent survey and evaluation of conservation status before consideration can be given to declaration as threatened fauna.
- P4** **Priority Four: Taxa in need of monitoring:** Taxa which are considered to have been adequately surveyed, or for which sufficient knowledge is available, and which are considered not currently threatened or in need of special protection, but could be if present circumstances change. These taxa are usually represented on conservation lands.
- P5** **Priority Five: Taxa in need of monitoring:** Taxa which are not considered threatened but are subject to a specific conservation program, the cessation of which would result in the species becoming threatened within five years.

Categories of threatened species (*Environment Protection and Biodiversity Conservation Act 1999*)

- EX** **Extinct:** A native species for which there is no reasonable doubt that the last member of the species has died.
- EX(W)** **Extinct in the wild:** A native species which:
(a) is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; or
(b) has not been recorded in its known and/or expected habitat, at appropriate seasons, anywhere in its past range, despite exhaustive surveys over a time frame appropriate to its life cycle and form.
- CR** **Critically Endangered:** A native species which is facing an extremely high risk of extinction in the wild in the immediate future, as determined in accordance with the prescribed criteria.
- EN** **Endangered:** A native species which:
(a) is not critically endangered; and
(b) is facing a very high risk of extinction in the wild in the near future, as determined in accordance with the prescribed criteria.
- VU** **Vulnerable:** A native species which:
(a) is not critically endangered or endangered; and
(b) is facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with the prescribed criteria.
- CD** **Conservation Dependent:** A native species which is the focus of a specific conservation program, the cessation of which would result in the species becoming vulnerable, endangered or critically endangered within a period of 5 years.