



# Clearing Permit Decision Report

## 1. Application details

### 1.1. Permit application details

Permit application No.: 4976/4  
Permit type: Purpose Permit

### 1.2. Proponent details

Proponent's name: Millennium Minerals Limited

### 1.3. Property details

Property: Mining Leases: 46/3, 46/47, 46/98, 46/129, 46/146, 46/163, 46/164, 46/166, 46/186, 46/198, 46/199, 46/200, 46/225, 46/261, 46/262, 46/265, 46/266, 46/272, 46/273, 46/274, 46/277, 46/282, 46/302, 46/431, 46/433, 46/436, 46/441, 46/442, 46/444, 46/446, 46/447;  
Miscellaneous Licences: 46/88, 46/89, 46/90, 46/91, 46/92, 46/98, 46/105.

Local Government Area: Shire of East Pilbara  
Colloquial name: Nullagine Gold Project

### 1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
489.03		Mechanical Removal	Mineral Production and Associated Activities

### 1.5. Decision on application

Decision on Permit Application: Grant  
Decision Date: 16 June 2016

## 2. Site Information

### 2.1. Existing environment and information

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

**Vegetation Description** The application area has been broadly mapped as Beard vegetation association 190: Hummock grasslands, sparse shrub steppe; *Acacia bivenosa* and *A. trachycarpa* over hard spinifex, *Triodia wiseana*; Very poor rocky country on gneiss (GIS Database).

Extensive flora and vegetation surveys of the broader Nullagine Gold Project area were undertaken by Mattiske Consulting Pty Ltd (Mattiske) in July 2005, April 2006, May 2010 and April 2011 (Mattiske, 2012).

Mattiske (2012) defined and mapped 12 plant communities within the original permit area and these are detailed in Decision Report CPS 4976/1. Additional surveys were conducted by Mattiske during 2010 over the All Nations and Little Wonder mining lease areas, and the results of these surveys are outlined in Decision Report CPS 4976/2. Further surveys were conducted by Rapallo Group (Rapallo) during 2014 over the Roscoes Reward, Junction, and Condor satellite ore bodies and a new haulroad route, and these are outlined in Decision Report CPS 4976/3.

Surveys were conducted by Rapallo (2015c) and Mattiske (2015) over the proposed sites of a new tailings storage facility (TSF) and a new road, which are the subject of this amendment application.

Rapallo (2015c) described the vegetation of the proposed road area as: *Triodia longiceps* dominated sloping plain with occasional *Acacia trachycarpa* shrubland with occasional *Acacia bivenosa* and occasional emergent *Eucalyptus leucophloia* subsp. *leucophloia* and *Melaleuca eleuterostachya*.

The following nine vegetation communities were recorded within the area proposed for the new TSF (Mattiske, 2015):

**A1:** Shrubland of *Acacia aptaneura*, *Acacia sclerosperma* subsp. *sclerosperma*, *Acacia trachycarpa* and *Carissa lanceolata* over *Triodia longiceps*, *Triodia pungens* and \**Cenchrus ciliaris* with mixed low shrubs and herbs on loamy soils on flats;

**C2:** Hummock Grassland of *Triodia angusta*, *Triodia pungens* and *Triodia longiceps* with emergent *Eucalyptus leucophloia* subsp. *leucophloia* and *Eucalyptus lucasii* over *Androcalva luteiflora*, *Acacia trachycarpa* and *Acacia bivenosa* over *Corchorus walcottii*, *Eriachne mucronata* and other herbs in broad, shallow drainage lines and depressions;

**C4:** Low Open Woodland of *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia candida* subsp. *dipsodes*, *Corymbia hamersleyana*, *Corymbia opaca* and *Eucalyptus lucasii* over *Acacia holosericea*, *Acacia inaequilatera*, *Acacia trachycarpa* and *Grevillea wickhamii* over *Petalostylis labicheoides* and *Gossypium robinsonii* with *Corchorus walcottii* and *Triodia* spp. on sandy clays on broad flow lines and flats;

**C8:** Hummock grassland of *Triodia longiceps* with patches of *Carissa lanceolata*, *Ptilotus obovatus* and *Indigofera monophylla* with mixed emergent shrubs of *Acacia trachycarpa* and *Acacia sclerosperma* subsp. *sclerosperma* on quartz and sandy clay soils on flood plains;

**HG1:** Hummock Grassland of mixed *Triodia wiseana* and *Triodia* spp. with mixed emergent shrubs of *Acacia aphanoclada*, *Acacia hilliania*, *Acacia arrecta*, *Acacia bivenosa*, *Melaleuca eleuterostachya* and *Senna* spp. over

mixed herbs on shallow gravelly and rocky hills with outcropping;  
**HG2:** Hummock Grassland of *Triodia* spp. with emergent *Eucalyptus leucophloia* subsp. *leucophloia*, *Corymbia hamersleyana*, *Grevillea wickhamii*, *Hakea lorea* subsp. *lorea*, *Dodonaea viscosa* subsp. *mucronata*, *Acacia arrecta*, *Acacia inaequilatera* and *Acacia trachycarpa* on rocky breakaways and gullies;  
**HG4:** Hummock Grassland of *Triodia pungens* and *Triodia wiseana* with patches of tussock grasses and emergent *Grevillea pyramidalis*, *Acacia inaequilatera* and *Eucalyptus leucophloia* subsp. *leucophloia* over *Acacia bivenosa* on low hills and slopes with quartz and gravels on pale brown soils;  
**HG9:** Hummock grassland of *Triodia longiceps* with very few *Pluchea tetranthera*, *Senna symonii* and *Poaceae* spp. on quartz and calcrete soils on flood plains; and  
**S1:** Dense shrubland of *Acacia trachycarpa* and *Petalostylis labicheoides* over *Triodia longiceps* on loamy soils on flats.  
 In addition, some areas were described as:  
**D:** Disturbed Community (Mattiske, 2015):

\* Denotes a weed species

<b>Clearing Description</b>	Nullagine Gold Project. Millennium Minerals Limited proposes to clear up to 489.03 hectares of native vegetation within a total boundary of approximately 804 hectares, for the purpose of several open pit gold mines and mining-related infrastructure. The project is located approximately seven kilometres east of Nullagine, in the Shire of East Pilbara.
<b>Vegetation Condition</b>	Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994);  To  Degraded: Structure severely disturbed; regeneration to good condition requires intensive management (Keighery, 1994).
<b>Comment</b>	The proposed clearing of native vegetation is for mine open pits and mining related infrastructure.  Clearing permit CPS 4976/1 was granted by the Department of Mines and Petroleum on 12 July 2012, and was valid from 4 August 2012 to 28 February 2021. Amended permit CPS 4976/2 was granted on 15 January 2015, increasing the area approved to clear from 190 hectares to 294 hectares, and increasing the permit boundary from approximately 534 hectares to approximately 591 hectares. Amended permit CPS 4976/3 was granted on 21 May 2015, increasing the area approved to clear from 294 hectares to 387.8 hectares, and increasing the permit boundary from approximately 591 hectares to approximately 702 hectares.  On 21 September 2015, the Permit Holder applied to amend CPS 4976/3 to increase the amount of clearing authorised from 387.8 hectares to 489.03 hectares, to increase the permit boundary from approximately 703 hectares to approximately 804 hectares, and to add Mining Lease 46/436 to the permit. The additional clearing is required for the construction of a new tailings storage facility and two new access roads.

### 3. Assessment of application against clearing principles

#### Comments

Millennium Minerals Pty Ltd has applied to increase the amount of clearing authorised and the permit boundary by approximately 101 hectares, to allow for the construction of a new tailings storage facility (TSF) and two new access roads. The amendment comprises two separate areas, located approximately six kilometres apart, and adjoining the existing permit area. The largest of the two amendment areas is approximately 96 hectares in size and is for the new TSF and an associated access road (approximately 400 meters in length), while the second amendment area is approximately five hectares in size and will allow for the construction of an access road (approximately one kilometre in length) connecting two existing haul roads.

Flora and vegetation surveys were conducted over the amendment areas by Rapallo Group (Rapallo) and Mattiske Consulting Pty Ltd (Mattiske). The vegetation associations, landforms, and fauna habitat types occurring within the additional areas are similar to those occurring within the previously approved permit area, and are well represented in the region (Mattiske, 2015; Rapallo, 2015c; GIS Database). The additional areas have suffered previous disturbance from historical mining and grazing activities (Mattiske, 2015; Rapallo, 2015c). The vegetation condition within the amendment application area was described by Rapallo (2015c) and Mattiske (2015) as ranging from Excellent to Degraded on the Keighery scale (Keighery, 1994). One weed species, *Cenchrus ciliaris* was recorded within the proposed TSF area and several other weed species have been previously recorded in surrounding areas (Mattiske, 2015). The amendment area is not likely to represent an area of greater biodiversity than the original permit area or surrounding areas (Mattiske, 2015; Rapallo, 2015c).

Rapallo (2015c) recorded three fauna species of conservation significance (or signs of their presence) within the proposed TSF area, as follows:

- Greater Bilby (*Macrotis lagotis*) (old burrow and diggings);
- Mulgara (recent diggings); and
- Rainbow Bee-eater (observed).

The Rainbow Bee-eater is a migratory species, which has a wide distribution throughout much of Australia. The proposed clearing is unlikely to have any impact on the conservation status of this species.

The Greater Bilby (listed as Vulnerable) is known to occur in the Nullagine region (DPaW, 2016b). The Department of Parks and Wildlife conducted a targeted bilby and mulgara survey over the proposed TSF area in January 2016, to verify the observations made during the Rapallo (2015c) survey (DPaW, 2016b). The area was comprehensively searched for suitable habitat and any signs of the two species, including bilby or mulgara burrows, diggings, tracks or scats (DPaW, 2016b). Some suitable bilby habitat occurs within and around the proposed TSF Area, with approximately 21.2 hectares of potential bilby habitat recorded within the 96 hectare proposed TSF area (DPaW, 2016b). However, no signs (burrows, diggings, scats) of bilbies were found within or in close proximity to the proposed TSF area, and the burrows previously suspected of being bilby burrows were all confirmed as being varanid lizard burrows (DPaW, 2016b).

Remote cameras recorded mulgara within the proposed TSF area and possible mulgara burrows were found to the west of the proposed TSF area (DPaW, 2016b). It was considered likely that mulgara burrows existed under spinifex clumps within the proposed TSF area, although none were observed. DPaW (2016b) concluded that the mulgara were most likely Brush-tailed Mulgara (*Dasyercus blythi*) (Priority 4) and that they are likely to be widespread in the surrounding area. DPaW (2016b) advised that mulgara present within the proposed clearing area could be translocated to surrounding areas prior to the commencement of clearing activities.

The fauna habitats within the amendment areas are all widespread in surrounding areas, and the additional clearing is unlikely to have a significant impact on fauna habitat availability at a local or regional scale.

No Threatened flora have been recorded during the various surveys conducted over the permit area (Mattiske, 2010a, 2010b, 2012, 2014, 2015; Rapallo, 2015a, 2015b, 2015c).

Two Priority One flora species, *Acacia aphanoclada*, and *Euphorbia sarcostemmoides* have been recorded within the amendment area (Mattiske, 2015). One plant of *Euphorbia sarcostemmoides* (P1) was recorded within the proposed TSF area (Mattiske, 2015), and a population of 18 plants was recorded outside of the application area (Millennium Minerals, 2016). The clearing of one individual within the proposed TSF area is unlikely to impact the conservation status of *Euphorbia sarcostemmoides*.

A total of 384 plants of *Acacia aphanoclada* (P1) were recorded at 28 locations high up on a ridge within the northern edge of the proposed TSF area, within the HG1 vegetation community (Mattiske, 2015). *Acacia aphanoclada* is a tall slender shrub which is only known from the Nullagine area and is found sparsely scattered on rocky hills, ridges and rises (Mattiske, 2010a; Western Australian Herbarium, 2014). Mattiske (2012) reviewed the results of several previous flora and vegetation surveys which had been conducted over various sections of the Nullagine Gold Project area between 2005 and 2011. The Nullagine Gold Project area incorporates several minesites and connecting haulroads which stretch over a distance of approximately 40 kilometres from the Golden Eagle minesite at the south-western end to the Golden Gate minesite at the north-eastern end. Mattiske (2012) reported that 38 populations of *Acacia aphanoclada* were recorded in the surveys conducted between 2005 and 2011, although it was noted that records from 2005 could not be confirmed due to the sterile specimen collected. Although several of the records did not specify the size of the population, where plant numbers were provided there were commonly less than 10 plants, with the largest populations recorded as 23 and 60 plants respectively (Mattiske, 2012). Given that these surveys were conducted over potential mining project areas, it is noted that many of these populations may have been impacted by subsequent mining or construction activities since the surveys were undertaken. Although this species is apparently quite widespread in the local area it is sparsely distributed, and appears to be restricted to only four (C6, HG1, HG3 and HG5) out of the 17 plant communities that were mapped across the greater Nullagine Gold Project area (Mattiske, 2012). Considering the small size of previously recorded populations in the wider area, and the restricted distribution, the 384 plants of *Acacia aphanoclada* recorded within the amendment area, on the ridge along the northern edge of the proposed TSF, would appear to represent a significant population for this species. Millennium Minerals (2016) initially stated that the northern ridge area was not intended to be impacted for the proposed TSF construction. However, the proponent subsequently advised that some of the 384 plants of *Acacia aphanoclada* recorded within the proposed TSF area were required to be cleared.

According to Van Vreeswyk *et al.*, (2004), *Acacia aphanoclada* is restricted to the Ridge and Hills landform unit of the Mosquito land system, which makes up approximately 40% (73,600 hectares) of the 184,000 hectare land system. Barker (2007) investigated the distribution of *Acacia aphanoclada* and reported that the species is also found slightly outside of the mapped area of the Mosquito land system and speculated that the distribution may be linked to a preferred rock unit. Barker (2007) surveyed a total of 165 quadrats (50m x 200m) at 1.5 kilometre intervals along roadsides and tracks in the Nullagine area, located within and just outside the mapped boundaries of the Mosquito land system. *Acacia aphanoclada* was recorded from 35% of quadrats surveyed by Barker (2007) within the Mosquito land system, and 14% of quadrats surveyed outside the Mosquito land system. Consistent with the Mattiske (2012) records, the majority of populations recorded by Barker (2007) were of less than 20 plants, while a few quadrats recorded between 76 and 107 plants. Barker (2007) confirmed that the species was confined to the Nullagine area, and noted that the highest plant densities were associated with high rocky ridges. Mattiske (2012) does not discuss the relationship between the Ridge and Hill landform unit of the Mosquito land system and the C6, HG1, HG3 and HG5 vegetation communities within which this species was recorded during the various Mattiske surveys.

Woodgjs (2016) reported that the *Acacia aphanoclada* population adjacent to the proposed TSF extends over the top of the ridge outside the clearing permit application area, and that the total population on the ridge is

approximately 721 plants scattered over an area of approximately 11.22 hectares. Woodgis (2016) contends that, based on extrapolations from the results of previous surveys, the occurrence of *Acacia aphanoclada* within the local area may number in the hundreds of thousands of plants. DPaW (2016a) advised that as this species is not found in dense occurrences, and its occurrence is apparently highly defined by edaphic features, more detailed analysis of the occurrence of the species within the vegetation associations would be required before such broad generalisations can be made.

DPaW (2016a) further advised that, based on the available survey results, the *Acacia aphanoclada* population on the ridgeline adjacent to the proposed TSF is a significant population, although it was acknowledged that the relative significance of this population may decrease if more extensive surveys were undertaken outside of proposed disturbance areas. DPaW (2016a) recommended that the top of the ridgeline should be preserved to protect the portion of the population on the northern side of the ridge, and as much as possible of the population on the southern side of the ridge (adjacent to the TSF) should be retained. Potential impacts to Priority flora as a result of the proposed clearing may be minimised by the implementation of a flora management condition.

No Threatened Ecological Communities have been recorded within the vicinity of the permit area (Mattiske, 2010a, 2010b, 2012, 2015; Rapallo, 2015a, 2015b, 2015c; GIS Database). The original permit area and the amendment area fall within the buffer zone for the Priority Ecological Community (PEC) 'Stony saline plains of the Mosquito Land System' (Priority 3) (DPaW, 2015; GIS Database). The buffer zone is based on mapping of the Mosquito Land System in Van Vreeswyk *et al.* (2004) (DEC, 2012). The PEC represents Unit 4 of the Mosquito Land System, described by Van Vreeswyk *et al.* (2004) as patchy hummock grasslands of *Triodia longiceps* with isolated to scattered shrubs of *Acacia*, *Senna* and *Maireana* spp., on stony saline plains (DEC, 2012). None of the vegetation associations mapped within the amendment area are considered to be representative of this PEC (Mattiske, 2015; Rapallo, 2015c).

The permit area is located within the Chichester subregion of the Pilbara Interim Biogeographic Regionalisation of Australia (IBRA) bioregion (GIS Database). This subregion is characterised by plains supporting a shrub steppe of *Acacia inaequilatera* over *Triodia wiseana* hummock grasslands, while *Eucalyptus leucophloia* tree steppes occur on the ranges (CALM, 2002). The permit area is broadly mapped as Beard vegetation association 190 (GIS Database). Approximately 99% of the pre-European extent of this vegetation association remains uncleared at both the state and bioregional level (Government of Western Australia, 2014). Hence, the vegetation proposed to be cleared does not represent a significant remnant of native vegetation in an area that has been extensively cleared.

The amendment area falls within the same land system as the majority of the original permit area, the Mosquito land system (GIS Database). This land system generally has low susceptibility to erosion (Van Vreeswyk *et al.*, 2004), and the additional area of clearing is unlikely to result in appreciable land degradation.

There are no watercourses or wetlands within the amendment area (GIS Database). The southern end of the original permit area falls within a Public Drinking Water Source Area (Priority 3), the Nullagine Water Reserve (GIS Database). The largest of the two amendment areas is also located within the Water Reserve (GIS Database). To ensure the protection of water resources, all activities within the water reserve should be conducted in accordance with Department of Water (DoW) Water Quality Protection Notes and Guidelines, and any groundwater abstraction in this area is subject to licencing by the DoW (DoW, 2014).

The amendment application has been assessed against the clearing principles, planning instruments and other matters in accordance with s.51O of the *Environmental Protection Act 1986*. Environmental information has been reviewed, and the assessment of the proposed clearing against the clearing principles remains consistent with the assessment contained in decision reports CPS 4976/1, 4976/2 and 4976/3.

**Methodology** Barker (2007)  
CALM (2002)  
DEC (2012)  
DoW (2014)  
DPaW (2015)  
DPaW (2016a)  
DPaW (2016b)  
Government of Western Australia (2014)  
Keighery (1994)  
Mattiske (2010a, 2010b, 2012, 2014, 2015)  
Millennium Minerals (2016)  
Rapallo (2015a, 2015b, 2015c)  
Van Vreeswyk *et al.* (2004)  
Western Australian Herbarium (2014)  
Woodgis (2016)

GIS Database:  
- Geodata, Lakes

- Hydrography, linear
- Nullagine 80cm Orthomosaic - Landgate 2007
- Pre-European Vegetation
- Public Drinking Water Source Areas (PDWSAs)
- Threatened Ecological Sites Buffered
- Topographic Contours, Statewide

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

### Comments

There are two native title claims over the application area (WC1999/008 and WC1999/016) (GIS database). These claims have been registered with the National Native Title Tribunal on behalf of the claimant groups. However, the mining tenements have 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 no registered Aboriginal Sites of Significance within the application area (DAA, 2016; GIS Database). One registered Aboriginal Site of Significance (site 704) occurs within close proximity to the area proposed for the construction of the TSF (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 Golden Eagle Satellite Deposits Development (which included parts of the area covered by CPS 4976/1) was assessed by the then federal Department of Sustainability, Environment, Water, Population and Communities (SEWPAC), (now the Department of the Environment (DotE)), during 2011/2012 under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The project was determined to be a controlled action under the EPBC Act and the development was approved (EPBC 2011/5855) subject to conditions aimed at protecting the Greater Bilby, *Macrotis lagotis*. The conditions of the EPBC Act approval included limiting the disturbance area for the project to 294 hectares (DSEWPaC, 2012). Following subsequent amendments to the clearing permit, the area approved to clear under the clearing permit is greater than 294 hectares, however, much of the footprint of the clearing permit falls outside of the EPBC Act project area where this restricted clearing limit applies. Millennium Minerals (2016) has advised that the clearing limit imposed by the EPBC Act approval has not been exceeded.

It is noted that the proposed clearing may impact on the Greater Bilby (*Macrotis lagotis*) which is a protected matter under the *Environment Protection and Biodiversity Conservation Act 1999* (the EPBC Act). The proponent may be required to refer the additional disturbance areas to the (Federal) Department of the Environment for environmental impact assessment under the EPBC Act. The proponent is advised to contact the Department of the Environment for further information regarding notification and referral responsibilities under the EPBC Act.

It is the proponent's responsibility to liaise with the Department of Environment Regulation, the Department of Parks and Wildlife, 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.

The amendment application was advertised on 5 October 2015 by the Department of Mines and Petroleum inviting submissions from the public. No submissions were received in relation to this application.

### Methodology

DAA (2016)  
DSEWPaC (2012)  
Millennium Minerals (2016)

GIS Database:  
- Aboriginal Sites Register System

## 4. References

- Barker (2007) Distribution of *Acacia aphanoclada* and the Effect of Soil Mineralogy and Water Availability on Habitat Preference. Honours Thesis, University of Notre Dame, June 2007.
- CALM (2002) A Biodiversity Audit of Western Australia's 53 Biogeographic Subregions in 2002. Department of Conservation and Land Management, Western Australia.
- DAA (2016) Aboriginal Heritage Enquiry System. Department of Aboriginal Affairs. <http://maps.dia.wa.gov.au/AHIS2/> (Accessed 11 May 2016).
- DEC (2012) Advice from Species and Communities Branch for Clearing Permit Application CPS 4976/1. Department of Environment and Conservation, June 2012.
- DoW (2014) Advice from DoW for Application to amend Clearing Permit 1011/1. Department of Water, September 2014.
- DPaW (2015) Priority Ecological Communities for Western Australia Version 23. Species and Communities Branch, Department of Parks and Wildlife, 3 December 2015.

- DPaW (2016a) Advice received in relation to Clearing Permit Application CPS 4976/4. Species and Communities Branch, Department of Parks and Wildlife, Western Australia, June 2016.
- DPaW (2016b) Golden Eagle Proposed Tailings Storage Facility Area Targeted Mulgara and Greater Bilby Survey. Department of Parks and Wildlife, Perth, February 2016.
- DSEWPaC (2012) Golden Eagle Satellite Deposits Development, Pilbara, WA (EPBC 2011/5855). Department of Sustainability, Environment, Water, Population and Communities, 17 January 2012.
- Government of Western Australia (2014) 2014 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of June 2014. WA Department of Parks and Wildlife, Perth.
- 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 (2010a) Assessment of Flora and Vegetation of the All Nations Lease Area. Report prepared for Millennium Minerals Limited, by Mattiske Consulting Pty Ltd, August 2010.
- Mattiske (2010b) Assessment of Flora and Vegetation of the Little Wonder Lease Area. Report prepared for Millennium Minerals Limited, by Mattiske Consulting Pty Ltd, December 2010.
- Mattiske (2012) Flora and Vegetation of the Nullagine Project Areas. Report Prepared by Mattiske Consulting Pty Ltd for Millennium Minerals Limited, April 2012.
- Mattiske (2014) Flora and Vegetation of the Junction and Roscoes reward Deposits. Report prepared for Millennium Minerals Limited, by Mattiske Consulting Pty Ltd, September 2014.
- Mattiske (2015) Flora and Vegetation of Proposed Tailings Storage Facility. Report prepared for Millennium Minerals Limited, by Mattiske Consulting Pty Ltd, December 2015.
- Millennium Minerals (2016) Additional information received in relation to Clearing Permit Application CPS 4976/4. Millennium Minerals Ltd, Western Australia.
- Rapallo (2015a) Flora and vertebrate Fauna Desktop Study and general Site Reconnaissance of the Condor Satellite Pit Extension. Prepared for Millennium Minerals Limited, by Rapallo Group, March 2015.
- Rapallo (2015b) Flora and vertebrate Fauna Desktop Study and general Site Reconnaissance of the Proposed Haul Road Route. Report prepared for Millennium Minerals Limited, by Rapallo Group, March 2015.
- Rapallo (2015c) Flora and Vertebrate Fauna Desktop Study and Site Reconnaissance (Fauna Habitat) of the proposed tailings Storage Facility, additional Project Areas and Roadlink. Report prepared for Millennium Minerals Limited, by Rapallo Group, September 2015.
- 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 (2014) FloraBase - the Western Australian Flora. Department of Parks and Wildlife. <https://florabase.dpaw.wa.gov.au/>
- Woodgis (2016) *Acacia aphanoclada* subpopulation at proposed TSF Site. Report prepared for Millennium Minerals Limited, by Woodgis Environmental Assessment and Management, May 2016.

## 5. Glossary

### Acronyms:

<b>BoM</b>	Bureau of Meteorology, Australian Government
<b>DAA</b>	Department of Aboriginal Affairs, Western Australia
<b>DAFWA</b>	Department of Agriculture and Food, Western Australia
<b>DEC</b>	Department of Environment and Conservation, Western Australia (now DPaW and DER)
<b>DER</b>	Department of Environment Regulation, Western Australia
<b>DMP</b>	Department of Mines and Petroleum, Western Australia
<b>DRF</b>	Declared Rare Flora
<b>DotE</b>	Department of the Environment, Australian Government
<b>DoW</b>	Department of Water, Western Australia
<b>DPaW</b>	Department of Parks and Wildlife, Western Australia
<b>DSEWPaC</b>	Department of Sustainability, Environment, Water, Population and Communities (now DotE)
<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 (2015) 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.  
**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.  
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.

**Principles for clearing native vegetation:**

- (a) Native vegetation should not be cleared if it comprises a high level of biological diversity.
- (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.
- (c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.
- (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.
- (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.
- (f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.
- (g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.
- (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.
- (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.
- (j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.