



Clearing Permit Decision Report

1. Application details

1.1. Permit application details

Permit application No.: 9315/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Navigator Mining Pty Ltd

1.3. Property details

Property: Mining Leases 37/86, 37/88, 37/227, 37/277, 37/299, 37/300, 37/317, 37/422, 37/428, 37/646, 37/1303, 37/1304, 37/1318, 37/1319, 37/1328, 37/1331, 37/1332, Miscellaneous Licences 37/106, 37/127, 37/242, 37/243
Local Government Area: Shire of Leonora
Colloquial name: Cardinia Project

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
400.49		Mechanical removal	Mineral production and associated activities

1.5. Decision on application

Decision on Permit Application: Grant
Decision Date: 20 January 2022

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 associations (GIS Database):
18: Low woodland; mulga (*Acacia aneura*);
28: Open woodland; mulga; and
39: Shrublands; mulga scrub.

Several flora and vegetation surveys were conducted over the larger Leonora Gold project area by Western Botanical which the permit area forms a large part of (360 Environmental, 2021). The following vegetation associations were recorded within the larger flora survey area (Western Botanical, 2019):

Mulga Woodlands over Perennial Non Halophytic Shrubs on hills and plains

AaArEpLoU, Grasses: *Acacia aneura*, *A. ramulosa*, *Eremophila platycalyx* subsp. Leonora (Morrisey J. 252), *Ptilotus obovatus* (Upright form) Shrubland and grasses;

AaPoUMt: *Acacia aneura* (forms), *Ptilotus obovatus* (Upright form), *Maireana triptera* Shrubland;

Dead AaPoUMt: Dead vegetation, formerly *Acacia aneura* (forms), *Ptilotus obovatus* (Upright form), *Maireana triptera* Shrubland;

AaMsSsNPoG: *Acacia aneura*, *Maireana sedifolia*, *Scaevola spinescens* Narrow leaf spiny form *Ptilotus obovatus* (typical Goldfields form) Shrubland;

AbSafAmpMt: *Acacia burkittii*, *Senna artemisioides* subsp. *filifolia*, *Maireana* spp. Shrubland;

AaEpLSppPoUMt: *Acacia aneura* (forms) over *Eremophila platycalyx* subsp. Leonora (Morrisey J. 252) over *Senna* spp. over *Ptilotus obovatus* (Upright form) and *Maireana triptera* Shrubland;

AaEmP: *Acacia aneura* (forms) over *Eremophila* spp. (*E. margarethae*, *E. compacta* subsp. *compacta*, *E. simulans* subsp. *simulans* or *E. annoscaulis* P3) over *Ptilotus schwartzii* Shrubland;

SIMS AaEiSe: Stony Ironstone Mulga Shrubland *Acacia aneura*, *Eremophila latrobei*, *Sida ectogamma* Shrubland on summits of chert, quartz hills and slopes;

SIMS AaPoUSe: Stony Ironstone Mulga Shrubland *Acacia aneura*, *Ptilotus obovatus* (Upright form), *Ptilotus schwartzii* Shrubland on midslopes of chert, quartz hills and slopes;

SIMS AaEcEf: Stony Ironstone Mulga Shrubland *Acacia aneura* (forms) over *Eremophila clarkei*, *Eremophila forrestii* Shrubland on summit of low ferricrete hills;

AaMsPoUMt: *Acacia aneura* over *Maireana sedifolia* over *Ptilotus obovatus* (Upright form) Shrubland over *Maireana triptera* Shrubland and grasses;

MpMsFspp: *Maireana pyramidata*, *Maireana sedifolia*, *Frankenia* spp. Open Low Shrubland and grasses;

AaEpLEm: *Acacia aneura* (sens. lat.), *Eremophila platycalyx* subsp. Leonora (Morrisey J. 252) over *Eremophila compacta* and *Ptilotus obovatus* (Upright form) Shrubland;

AaArAqEp: *Acacia aneura* (sens. lat.), *Acacia ramulosa*, *Acacia quadrimarginea*, *Eremophila platycalyx* subsp. Leonora (Morrisey J. 252) Shrubland;

SAES: Stony Acacia - Eremophila Shrubland;

HPDS: Hardpan Plain, deflation zone;

HPMS: Hardpan Mulga Shrubland;

AaPoGMt: *Acacia aneura*, *Maireana triptera*, *Ptilotus obovatus* Goldfields Form Shrubland over *Aristida contorta*

Mulga Shrublands / Woodlands over Perennial Grasses on Plains

MUWA: Mulga-Wanderrie (*Acacia aneura*, *Eragrostis eriopoda*) Grassland;

WABS: Wanderrie Bank Grassy Shrublands (*Eragrostis eriopoda*) Grassland;

Acacia Woodlands over Shrubs and Grasses in Major Drainage Lines and Groves

DRMS: Drainage Line Mulga (*Acacia aneura* sens. lat.) Woodland;

DRAbS: Drainage line *Acacia burkittii* Woodland;

GRMU: Groved Mulga Woodland;

Acacia (other than Mulga) Shrublands on Stony Hills

Amp: *Acacia* sp. Marshall Pool (G. Cockerton 3024) Shrubland;

AmpAsAa: *Acacia* sp. Marshall Pool (G. Cockerton 3024), *A. sibirica*, *Acacia aneura*, *A. burkittii* Shrubland;

AdAspMPPoG: *Acacia doreta* short phyllode form (M. Stone & S. Colwill WB34381), *Acacia* sp. Marshall Pool (G. Cockerton 3024) Open Woodland *Ptilotus obovatus* (Goldfields form) Shrubland;

AbPoG: *Acacia burkittii*, *Ptilotus obovatus* (Goldfields form) Shrubland;

Acacia papyrocarpa Woodlands

ApTdS: *Acacia papyrocarpa* Open Low Woodland, *Tecticornia disarticulata* Shrubland;

ApEsMspp: *Acacia papyrocarpa* Open Low Woodland, *Eremophila scoparia* and *Maireana* spp. Shrubland;

ApPoUMt: *Acacia papyrocarpa* Open Low Woodland, *Ptilotus obovatus* (Upright form), *Maireana triptera* Shrubland and grasses;

ApMt: *Acacia papyrocarpa* Open Low Woodland, *Maireana pyramidata* Shrubland;

Acacia victoriae Shrubland over Chenopods on Calcrete Plains

AvS: *Acacia victoriae* Shrubland;

Perennial Grasslands

EyC: *Eragrostis* sp. Yeelirrie Calcrete (S. Regan LCH 26770) Hummock Grassland on Calcrete;

NmHG: *Neurachne munroi* Hummock Grassland on Mudstone;

Hakea preissii and/or Halophytic Chenopod Shrublands

HpTdMpS: *Hakea preissii*, *Maireana pyramidata*, *Tecticornia disarticulata* Shrubland;

HpMpCs: *Hakea preissii*, *Maireana pyramidata*, *Cratystylis subspinescens* Shrubland;

HpMpEs: *Hakea preissii*, *Maireana pyramidata*, *Eremophila scoparia* Shrubland;

HpPoGMt: *Hakea preissii*, *Ptilotus obovatus* (Goldfields form), *Maireana triptera* Shrubland;

HpMpMsp59: *Hakea preissii*, *Maireana pyramidata*, *Maireana tomentosa* (type 1 WB38650) complex Shrubland and grasses;

HpEsMt: *Hakea preissii*, *Eremophila scoparia*, *Maireana triptera* Shrubland;

MtFsp: *Maireana triptera*, *Frankenia* spp. Low Open Shrubland;

MpMg: *Maireana pyramidata*, *M. georgei* Shrubland;

TdFspMt: *Tecticornia disarticulata*, *Surreya diandra*, *Frankenia setosa*, *Maireana tomentosa* (type 1 WB38650) complex Shrubland;

Mt, Td: *Maireana tomentosa* (type 1 WB38650) *Tecticornia disarticulata* Shrubland;

Fsp: *Frankenia* spp. Shrubland;

AmCs: *Acacia masliniana*, *Cratystylis subspinescens* Shrubland;

Cpn-B: Bare claypan, no vegetation;

Casuarina pauper Woodland on Calcrete Outcrops

CpW: *Casuarina pauper* Woodland over Chenopods on Calcrete outcrops;

Claypans

CPN-G: Grassy Claypan (*Eragrostis xerophila* Grassland);

Gilgai: *Pittosporum angustifolium*, *Acacia tetragonophylla* and *A. victoriae* Shrubland over Claypan Grasses;

Breakaway Complex

EsFspSsp: *Eremophila scoparia*, *Frankenia* spp. Shrubland with *Sclerolaena diacantha*.

Clearing Description	Cardinia Project. Navigator Mining Pty Ltd proposes to clear up to 400.49 hectares of native vegetation within a boundary of approximately 4,108.2 hectares, for the purpose of mineral production and associated activities. The project is located approximately 18.5 kilometres east of Leonora, within the Shire of Leonora.
Vegetation Condition	Excellent: Vegetation structure intact; disturbance affecting individual species, weeds non-aggressive (Keighery, 1994); to Completely Degraded: No longer intact; completely/almost completely without native species (Keighery, 1994).
Comment	The vegetation condition was derived from vegetation surveys conducted by Western Botanical (2019) and Stantec (2018). At the time of the Stantec survey there was good rainfall preceding the survey and there were large numbers of annual species recorded. The conditions during the Western Botanical survey were relatively dry and few annuals were recorded. The proposed clearing is for mining at the Cardinia project. Specifically this permit will cover the mining of the Kyte and Lewis Phase 4 pits, accommodation camp, access roads, water supply borefield, magazine and laydown areas (360 Environmental, 2021).

3. Assessment of application against Clearing Principles

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

Comments	<p>Proposal is not likely to be at variance to this Principle</p> <p>The flora and vegetation surveys which covered the permit area and other areas adjacent to the permit boundary, identified a total of 51 vegetation associations (Western Botanical, 2019). The relatively high number of communities is likely due several factors including the detail of the mapping, the elongated nature of the survey area and the interplay between geological, topographic, hydrological and salinity factors within the survey area (Western Botanical, 2019). None of the vegetation communities within the permit area have been identified as a Threatened or Priority Ecological Community (Western Botanical, 2019; GIS Database).</p> <p>There was 321 flora species from 44 families and 132 genera recorded from the larger survey boundary (Western Botanical, 2019). The number of species recorded is considered to be representative of flora of similar landforms in the north-eastern Goldfields (Western Botanical, 2019). No species of Threatened flora have been recorded within the permit area (Western Botanical, 2019; GIS Database). There was three species of Priority flora recorded during the flora surveys; <i>Acacia</i> sp. Marshall Pool (Priority 3), <i>Eremophila annosocaulis</i> (Priority 3) and <i>Cratystylis centralis</i> (Priority 3) (Western Botanical, 2019).</p> <p><i>Acacia</i> sp. Marshall Pool is a small tree which was recorded from low to high rounded hills of weathered gabbro and basalt with infiltrated paleo groundwater calcrete (Western Botanical, 2019). This habitat is generally associated with the Leonora land system as mapped by Department of Agriculture (Western Botanical, 2019). Western Botanical has estimated the total population for this species to be 37,266 plants across three population centres (Western Botanical, 2019). The permit area is located within the largest population of plants (estimated at approximately 31,364 individuals) however, of this population there are approximately 8,050 within the permit area (360 Environmental, 2021; Western Botanical, 2019). Almost all of these individuals (7,500) are located in the southeast corner of the permit area. Only approximately 500 plants</p>
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are proposed to be impacted by the proposed clearing and the proposed road in the southeast of the permit area will avoid the large populations of plants recorded there (360 Environmental, 2021).

Both *Eremophila annosicaulis* and *Cratystylis centralis* were recorded during the flora survey however, none of the locations were within the clearing permit boundary. There was also records within the permit area of *Gunniopsis propinqua*, which at the time of the survey was listed as a Priority 3 species but has since been reclassified to no longer have any Priority listing (Western Australian Herbarium, 1998-; Western Botanical, 2019). Individuals were also recorded of *Hibiscus* sp. Perrinvale Station which is a potential new species. It has only previously been collected from a low banded ironstone range on Perrinvale Station approximately 160 kilometres west of the permit area (Western Australian Herbarium, 1998-; Western Botanical, 2019). This plant was recorded at five locations within the greater survey area with an additional four locations where only vegetative material was recorded and may also be potential locations (Western Botanical, 2019). All of the plants were found on stony ground or hills with either ironstone or basalt rocks at the surface (Western Botanical, 2019). This species has since been listed as a Priority 3 species (Western Australian Herbarium, 1998-). There are three of the potential locations situated within the permit area (Western Botanical, 2019). Given this species is only known from very few records, any known or potential locations of this plant should be avoided until further investigations are completed to determine its proper extent. Potential impacts to this species may be minimised by a flora management condition requiring any potential locations to be avoided during clearing.

There were 20 species of weeds recorded in the larger flora survey area (Western Botanical, 2019). Weeds have the potential to out-compete native flora and reduce the biodiversity of an area. Potential impacts to biodiversity as a result of the introduction of weeds may be minimised by the implementation of a weed management condition.

There were eight broad fauna habitats mapped during fauna surveys of the greater Leonora Gold project (Phoenix Environmental Sciences, 2019). All of the habitats present in the permit area were considered to be well represented in the Eastern Murchison subregion (Phoenix Environmental Sciences, 2019). There was generally a low diversity of fauna habitats and a lack of significant habitat features (e.g. caves, perennial watercourses, major rock outcrops) (Phoenix Environmental Sciences, 2019). Based on the habitats present, the permit area is not likely to support a high level of faunal diversity and the faunal assemblage is likely to be similar to surrounding areas in the local area.

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

Methodology 360 Environmental (2021)
Phoenix Environmental Sciences (2019)
Western Australian Herbarium (1998-)
Western Botanical (2019)

GIS Database:

- Pre-European Vegetation
- Threatened and Priority Ecological Communities Boundaries
- Threatened and Priority Ecological Communities Buffers
- Threatened and Priority Flora
- 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.

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

A reconnaissance fauna survey was conducted of the greater Leonora Gold project (which includes the permit area) in April 2019. The survey identified the following fauna habitats (Phoenix Environmental Sciences, 2019):

- Mulga woodland on plain
- Shrubland on plain
- Acacia shrubland on plain
- Acacia woodland in drainage lines and groves
- Mulga woodland on stony hills
- Outcropping and breakaway
- Vegetated gilgai/claypan
- Cleared

The 'mulga woodland on plain' and 'shrubland on plain' were the most dominant habitats covering approximately 67% of the greater survey area (Phoenix Environmental Sciences, 2019). Whilst it only occupied a small area within the boundary of the fauna survey (40.22 hectares), the 'outcropping and breakaway' habitat is likely to have important ecological functions for local fauna (Phoenix Environmental Sciences, 2019). The habitat is described as outcrops of calcrete, basalt or other rock types with boulder piles,

small caves or crevices on hilltops, slopes and breakaways; woodland or shrubland vegetation (Phoenix Environmental Sciences, 2019). The habitat provides refuges such as crevices for smaller animals and dens and hunting perches for larger predators such as dingos and wedge-tailed eagles (Phoenix Environmental Sciences, 2019). Only a small amount of the habitat identified during the survey is present within the permit area (Phoenix Environmental Sciences, 2019).

A desktop review identified 30 species of conservation significant fauna which have the potential to be present within the permit area (Phoenix Environmental Sciences, 2019). The reconnaissance survey identified secondary evidence of three conservation significant fauna; Long-tailed Dunnart (*Sminthopsis longicaudata* – Priority 4), Burrowing Bettong (*Bettongia lesueur graii* – Extinct) and Greater Stick-nest Rat (*Leporillus conditor* – Conservation Dependent) (Phoenix Environmental Sciences, 2019). Historic warrens and nests of the Burrowing Bettong and Greater Stick-nest Rat were identified in the survey area, however these species are both extinct from the local area (Phoenix Environmental Sciences, 2019). Scats of the Long-tailed Dunnart were also recorded within the permit area (Phoenix Environmental Sciences, 2019). These scats were associated with crevices on rocky hills and breakaways (Phoenix Environmental Sciences, 2019). Only a small amount of this habitat was recorded in the permit area and the other habitats which this species uses for foraging and dispersal are well represented in the region (Phoenix Environmental Sciences, 2019).

There are previous records of Malleefowl (*Leipoa ocellata* – Vulnerable) within 20 kilometres of the permit area (Phoenix Environmental Sciences, 2019). The habitat within the permit area was considered to generally be of low suitability for this species given the lack of leaf litter for nest building due to the open and sparse vegetation cover through the area (Phoenix Environmental Sciences, 2019). Some areas of leaf litter were observed in Mulga woodland habitats however, these areas are of relatively low value for nest construction due to their patchy occurrence and mostly open canopy (Phoenix Environmental Sciences, 2019).

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

Methodology Phoenix Environmental Sciences (2019)

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

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

There are no known records of Threatened flora within the permit area (GIS Database). Flora surveys of the permit area did not record any species of Threatened flora (Western Botanical, 2019).

Based on the known distributions and habitats of Threatened flora species in the Murchison bioregion, the vegetation proposed to be cleared is unlikely to be necessary for the continued existence of any species of Threatened flora.

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

Methodology Western Botanical (2019)

GIS Database:
- Threatened and Priority 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.

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

There are no known Threatened Ecological Communities (TECs) located within or in close proximity to the permit area (GIS Database).

A flora and vegetation survey of the permit area did not identify any TECs (Western Botanical, 2019).

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

Methodology Western Botanical (2019)

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 permit area falls within the Murchison Bioregion of the Interim Biogeographic Regionalisation for Australia (IBRA) (GIS Database). Approximately 99.73% of the pre-European vegetation still exists in the IBRA Murchison Bioregion (Government of Western Australia, 2019). The permit area is broadly mapped as Beard vegetation associations 18, 28 and 39 (GIS Database). Over 98% of the pre-European extent of each of these vegetation associations remains uncleared at both the state and bioregional level (Government of Western Australia, 2019). The permit area does not contain any remnants nor does it form part of any remnants in the local area (GIS Database).

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

Methodology Government of Western Australia (2019)

GIS Database:

- IBRA Australia
- Imagery
- 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

There are no permanent watercourses or wetlands within the area proposed to clear (GIS Database). There are several ephemeral creeklines which intersect the permit area, the most significant of which are Bummer Creek and Cardinia Creek (see Figure 1 below) (GIS Database). Creek lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall.



Figure 1: Significant creeks within the permit area.

There were two vegetation associations identified as growing in association with drainage lines; 'drainage line mulga (*Acacia aneura* sens. Lat.) woodland' and 'drainage line *Acacia burkittii* woodland' (Western Botanical, 2019). The majority of these vegetation associations are associated with Cardinia and Bummer creeks. The only proposed activities within these creeklines is for access roads (360 Environmental, 2021). Provided that these tracks do not impede water flow, the proposed clearing is not likely to have a significant impact on riparian vegetation and watercourses in the local area. Potential impacts to vegetation growing in association with the watercourses may be minimised by the implementation of a watercourse management condition requiring the maintenance of existing surface water flow.

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

Methodology 360 Environmental (2021)
Western Botanical (2019)

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 may be at variance to this Principle

The application area lies within the Felix, Gundockerta, Hootanui, Jundee, Laverton, Leonora, Monitor, Nubev and Tiger land systems (GIS Database). These land systems have been mapped and described in technical bulletins produced by the former Department of Agriculture (now the Department of Primary Industries and Regional Development).

Both the Felix and Tiger land systems are generally not susceptible to erosion (Pringle et al., 1994). The Jundee land system is also mostly protected from soil erosion by gravelly mantles (Pringle et al., 1994).

Several land systems have an increased risk of erosion when areas of drainage are disturbed (Pringle et al., 1994). Where not protected by a stony mantle, saline plains and adjacent lower alluvial tracts within the Gundockerta land system are susceptible to water erosion (Pringle et al., 1994). Drainage tracts within the Nubev land system are moderately susceptible to erosion when vegetative or soil cover is removed (Pringle et al., 1994). The Gundockerta and Nubev land systems are the two largest land systems within the permit area (GIS Database). Narrow drainage tracts and breakaway footslopes within the Hootanui land system are susceptible to water erosion where perennial shrub cover is reduced or the soil surface is disturbed (Pringle et al., 1994). The Laverton land system is generally protected from soil erosion by stony mantles, except for narrow drainage tracts which are mildly susceptible to water erosion (Pringle et al., 1994). The drainage tracts within the Leonora land system are highly susceptible to water erosion (Pringle et al., 1994). There are drainage tracts present within this land system in the permit area (GIS Database). The drainage tracts, alluvial fans and hardpan plains within the Monitor land system are also highly susceptible to soil erosion (Pringle et al., 1994). Within the permit area, the Monitor land system is associated with Bummer Creek (GIS Database).

Given the majority of the land systems within the permit area have susceptibility to erosion, the proposed clearing has the potential to cause land degradation. This is particularly the case when drainage lines are disturbed. Potential impacts from soil erosion may be minimised by the implementation of a staged clearing condition. The intent of the condition is to require any areas that are cleared are utilised within 3 months of the clearing, which will minimise the amount of areas cleared which do not have mining activities occurring. A watercourse management condition may also reduce the potential for erosion by minimising disturbance within watercourses.

Based on the above, the proposed clearing may be at variance to this Principle.

Methodology Pringle et al. (1994)

GIS Database:
- Hydrography, linear
- Landsystem Rangelands

(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

There are no conservation areas in the vicinity of the application area. The nearest DBCA (formerly DPaW) managed land is an unnamed nature reserve which is located approximately 52 kilometres south of the permit area (GIS Database). The proposed clearing is unlikely to impact on the environmental values of any conservation area and does not form part of any linkages to conservation areas.

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

Methodology GIS Database:
- DPaW 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

There are no permanent watercourses or wetlands within the area proposed to clear (GIS Database). Creek

lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall. There are numerous ephemeral drainage lines which intersect the permit area, the most significant being Cardina Creek and Bummer Creek. The only proposed activities within these creeklines is for access roads (360 Environmental, 2021). Potential impacts to surface water flows and water quality may be minimised by the implementation of a watercourse management condition requiring the maintenance of existing surface water flow.

There are no Public Drinking Water Source Areas within or in close proximity to the application area (GIS Database). Generally, groundwater within the application area is 1,000 to 3,000 milligrams per litre of total dissolved solids which is considered to be brackish (GIS Database). The broader region remains largely uncleared and it is not likely that the proposed clearing will have an impact on groundwater quality in the local area.

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

Methodology 360 Environmental (2021)

GIS Database:

- Groundwater salinity, Statewide
- 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 climate of the region is semi-arid, with a low average rainfall of approximately 236.4 millimetres per year (BoM, 2022). Drainage lines in the area are dry for most of the year, only flowing briefly immediately following significant rainfall.

There are no permanent water courses or waterbodies within the application area (GIS Database). Seasonal drainage lines are common in the region and temporary localised flooding may occur briefly following heavy rainfall events. However, the proposed clearing is unlikely to increase the incidence or intensity of natural flooding events.

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

Methodology BoM (2022)

GIS Database:

- Hydrography, linear

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

Comments

The clearing permit application was advertised on 21 June 2021 by the Department of Mines, Industry Regulation and Safety (DMIRS), inviting submissions from the public. No submissions were received in relation to this application.

There are three native title claims over the area under application (DPLH, 2022). 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 is one registered Aboriginal Site of Significance within the application area (DPLH, 2022). 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 (2022)

4. References

- 360 Environmental (2021) Mining Proposal – Cardinia Gold Project. Report prepared for Navigator Mining Pty Ltd by 360 Environmental, 2 November 2021.
- BoM (2022) Bureau of Meteorology Website – Climate Data Online, Leonora. Bureau of Meteorology. <http://www.bom.gov.au/climate/data/> (Accessed 14 January 2022).
- 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.
- DPLH (2022) Aboriginal Heritage Inquiry System. Department of Planning, Lands and Heritage. <https://espatial.dplh.wa.gov.au/AHIS/index.html?viewer=AHIS> (Accessed 14 January 2022).
- Government of Western Australia (2019) 2018 Statewide Vegetation Statistics incorporating the CAR Reserve Analysis (Full Report). Current as of March 2019. WA Department of Biodiversity, Conservation and Attractions, Perth. <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.
- Phoenix Environmental Sciences (2019) Terrestrial Fauna Survey for the Leonora Gold Project. Report prepared for Kin Mining Ltd, by Phoenix Environmental Sciences, September 2019.
- Pringle, H.J.R., Van Vreeswyk, A.M.E., and Gilligan, S.A. (1994) An Inventory and Condition Survey of the north-eastern Goldfields, Western Australia. Department of Agriculture, Western Australia.
- Stantec (2018) Leonora Gold Project, Flora and Fauna Extrapolation Exercise Report. Report prepared for Kin Mining NL, by Stantec, September 2018.
- Western Australian Herbarium (1998-) FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions. <https://florabase.dpaw.wa.gov.au/> (Accessed 14 January 2022).
- Western Botanical (2019) Flora and Vegetation Assessment, Leonora Gold Project. Report prepared for Kin Mining Pty Ltd, by Western Botanical, June 2019.

5. Glossary

Acronyms:

BC Act	<i>Biodiversity Conservation Act 2016</i> , Western Australia
BoM	Bureau of Meteorology, Australian Government
DAA	Department of Aboriginal Affairs, Western Australia (now DPLH)
DAFWA	Department of Agriculture and Food, Western Australia (now DPIRD)
DAWE	Department of Agriculture, Water and the Environment, Australian Government
DBCA	Department of Biodiversity, Conservation and Attractions, Western Australia
DER	Department of Environment Regulation, Western Australia (now DWER)
DMIRS	Department of Mines, Industry Regulation and Safety, Western Australia
DMP	Department of Mines and Petroleum, Western Australia (now DMIRS)
DoEE	Department of the Environment and Energy (now DAWE)
DoW	Department of Water, Western Australia (now DWER)
DPaW	Department of Parks and Wildlife, Western Australia (now DBCA)
DPIRD	Department of Primary Industries and Regional Development, Western Australia
DPLH	Department of Planning, Lands and Heritage, Western Australia
DRF	Declared Rare Flora (now known as Threatened Flora)
DWER	Department of Water and Environmental Regulation, Western Australia
EP Act	<i>Environmental Protection Act 1986</i> , Western Australia
EPA	Environmental Protection Authority, Western Australia
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (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
PEC	Priority Ecological Community, Western Australia
RIWI Act	<i>Rights in Water and Irrigation Act 1914</i> , Western Australia
TEC	Threatened Ecological Community

Definitions:

{DBCA (2019) Conservation Codes for Western Australian Flora and Fauna. Department of Biodiversity, Conservation and Attractions, Western Australia}:-

T Threatened species:

Listed by order of the Minister as Threatened in the category of critically endangered, endangered or vulnerable under section 19(1), or is a rediscovered species to be regarded as threatened

species under section 26(2) of the *Biodiversity Conservation Act 2016* (BC Act).

Threatened fauna is that subset of 'Specially Protected Fauna' listed under schedules 1 to 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for Threatened Fauna.

Threatened flora is that subset of 'Rare Flora' listed under schedules 1 to 3 of the *Wildlife Conservation (Rare Flora) Notice 2018* for Threatened Flora.

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 in the immediate future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as critically endangered under section 19(1)(a) of the BC Act in accordance with the criteria set out in section 20 and the ministerial guidelines. Published under schedule 1 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for critically endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for critically endangered flora.

EN Endangered species

Threatened species considered to be "*facing a very high risk of extinction in the wild in the near future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as endangered under section 19(1)(b) of the BC Act in accordance with the criteria set out in section 21 and the ministerial guidelines. Published under schedule 2 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for endangered fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for endangered flora.

VU Vulnerable species

Threatened species considered to be "*facing a high risk of extinction in the wild in the medium-term future, as determined in accordance with criteria set out in the ministerial guidelines*".

Listed as vulnerable under section 19(1)(c) of the BC Act in accordance with the criteria set out in section 22 and the ministerial guidelines. Published under schedule 3 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for vulnerable fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for vulnerable flora.

Extinct Species:

EX Extinct species

Species where "*there is no reasonable doubt that the last member of the species has died*", and listing is otherwise in accordance with the ministerial guidelines (section 24 of the BC Act).

Published as presumed extinct under schedule 4 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018* for extinct fauna or the *Wildlife Conservation (Rare Flora) Notice 2018* for extinct flora.

EW Extinct in the wild species

Species that "*is known only to survive in cultivation, in captivity or as a naturalised population well outside its past range; and it has not been recorded in its known habitat or expected habitat, at appropriate seasons, anywhere in its past range, despite surveys over a time frame appropriate to its life cycle and form*", and listing is otherwise in accordance with the ministerial guidelines (section 25 of the BC Act).

Currently there are no threatened fauna or threatened flora species listed as extinct in the wild. If listing of a species as extinct in the wild occurs, then a schedule will be added to the applicable notice.

Specially protected species:

Listed by order of the Minister as specially protected under section 13(1) of the BC Act. Meeting one or more of the following categories: species of special conservation interest; migratory species; cetaceans; species subject to international agreement; or species otherwise in need of special protection.

Species that are listed as threatened species (critically endangered, endangered or vulnerable) or extinct species under the BC Act cannot also be listed as Specially Protected species.

MI Migratory species

Fauna that periodically or occasionally visit Australia or an external Territory or the exclusive economic zone; or the species is subject of an international agreement that relates to the protection of migratory species and that binds the Commonwealth; and listing is otherwise in accordance with the ministerial guidelines (section 15 of the BC Act).

Includes 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 fauna subject to the *Convention on the Conservation of Migratory Species of Wild Animals* (Bonn Convention), an environmental treaty under the United Nations Environment Program. Migratory species listed under the BC Act are a subset of the migratory animals, that are known to visit Western Australia, protected under the international agreements or treaties, excluding species that are listed as Threatened species.

Published as migratory birds protected under an international agreement under schedule 5 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

CD Species of special conservation interest (conservation dependent fauna)

Fauna of special conservation need being species dependent on ongoing conservation intervention to prevent it becoming eligible for listing as threatened, and listing is otherwise in accordance with the ministerial guidelines (section 14 of the BC Act).

Published as conservation dependent fauna under schedule 6 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

OS Other specially protected species

Fauna otherwise in need of special protection to ensure their conservation, and listing is otherwise in accordance with the ministerial guidelines (section 18 of the BC Act).

Published as other specially protected fauna under schedule 7 of the *Wildlife Conservation (Specially Protected Fauna) Notice 2018*.

P Priority species:

Possibly threatened species that do not meet survey criteria, or are otherwise data deficient, are added to the Priority Fauna or Priority Flora Lists under Priorities 1, 2 or 3. These three categories are ranked in order of priority for survey and evaluation of conservation status so that consideration can be given to their declaration as threatened fauna or flora.

Species that are adequately known, are rare but not threatened, or meet criteria for near threatened, or that have been recently removed from the threatened species or other specially protected fauna lists for other than taxonomic reasons, are placed in Priority 4. These species 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.