

Clearing Permit Decision Report

1. Application details and outcome

1.1. Permit application details

Permit number:	9315/2
Permit type:	Purpose Permit
Applicant name:	Navigator Mining Pty Ltd
Application received:	1 March 2024
Application area:	400.49 hectares
Purpose of clearing:	Mineral Production and associated activities
Method of clearing:	Mechanical Removal
Tenure:	Mining Leases 37/88, 37/299, 37/317, 37/422, 37/1303, 37/1304, 37/1318, 37/1328, 37/1332
Location (LGA area/s):	Shire of Leonora
Colloquial name:	Cardinia Gold Project

1.2. Description of clearing activities

Navigator Mining Pty Ltd proposes to clear up to 400.49 hectares of native vegetation within an amended boundary of approximately 2,067.49 hectares, for the purpose of mineral production and mining related infrastructure. The project is located approximately 18.5 kilometres in an easterly direction of Leonora, within the Shire of Leonora.

Clearing permit CPS 9315/1 was granted by the Department of Mines, Industry Regulation and Safety (now the Department of Energy, Mines, Industry Regulation and Safety) on 20 January 2022 and was valid from 12 February 2022 to 11 February 2027. The permit authorised the clearing of 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.

On 15 March 2024, the Permit Holder applied to amend CPS 9315/1 to remove miscellaneous licences 37/106, 37/127, 37/242, 37/243 and mining leases 37/86, 37/227, 37/277, 37/300, 37/428, 37/646, 37/1319, 37/1331 as these tenements have been sold. The proposed clearing area of 400.49 hectares remains the same, however the boundary of the application area has been reduced to 2,067.49 hectares. No clearing has taken place to date.

1.3. Decision on application and key considerations

Decision:	Grant
Decision date:	26 June 2025
Decision area:	400.49 hectares of native vegetation

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed, and determined in accordance with sections 51KA(1) and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) advertised the application for a public comment for a period of 7 days, and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics, relevant datasets, supporting information provided by the applicant including the results of a flora and vegetation survey and fauna survey, the clearing principles set out in Schedule 5 of the EP Act, and any other matters considered relevant to the assessment.

The assessment against the clearing principles resulted in Principles (a), (c), (d), (h), (i), and (j) as 'not likely at variance', Principle (e) as 'not at variance', Principles (b) and (g) 'may be at variance' and Principle (f) 'at variance'.

The assessment identified that the proposed clearing may result in:

- the potential introduction and spread of weeds into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values;
- potential impacts on watercourses;
- the loss of native vegetation that is suitable habitat for conservation significant fauna; and
- potential land degradation in the form of erosion.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures, and due to the decrease in size of the clearing area, the Delegated Officer determined the proposed clearing is unlikely to lead to appreciable land degradation and is not likely to lead to an unacceptable risk to environmental values.

The Delegated Officer decided to grant a clearing permit subject to conditions to:

- avoid, minimise to reduce the impacts and extent of clearing;
- take hygiene steps to minimise the risk of the introduction and spread of weeds;
- undertake slow, progressive one-directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity;
- commence construction no later than three months after undertaking clearing to reduce the risk of erosion.

Environmental information has been reviewed, and the assessment of the proposed clearing against the clearing principles remains consistent with the assessment contained in decision report CPS 9315/1.

2. Assessment of application

2.1. Avoidance and mitigation measures

The proposed area to be cleared has been designed by the applicant to minimise the clearing of vegetation. Avoidance and mitigation measures that the applicant committed to implement are listed below (360 Environmental, 2021):

- all processing associated with mine site will be moved off site to a third party which will reduce the clearing footprint of the project;
- roads have been designed to minimise unnecessary vegetation clearing and to optimise safety;
- clearing area will be demarcated prior to the commencement of project activities and prior to the commencement of native vegetation clearing;
- induction of all contractors and/or internal personnel undertaking the clearing in accordance with Navigator Mining's internal procedures and GPS coordinates of clearing application area to be supplied to contractor;
- prior to clearing and earthworks commencing within the clearing application area, the area will be clearly outlined (by barrier tape or star pickets) to ensure that no over clearing occurs beyond the permitted area;
- the construction of a pit-protection diversion bund to divert flood water from Cardinia Creek downstream to its intended destination; and
- prior to clearing activities, areas of native vegetation to be retained will be clearly demarcated by star pickets, coloured tape or bunting and all personnel should be made aware of the requirement to protect native vegetation in these areas.

The Delegated Officer was satisfied that the applicant has made a reasonable effort to avoid and minimise potential impacts of the proposed clearing on environmental values. Additionally, further management conditions have been placed on the clearing permit to mitigate and minimise potential impacts to environmental values.

2.2. Site map

A site map of proposed clearing is provided in Figure 1 below.

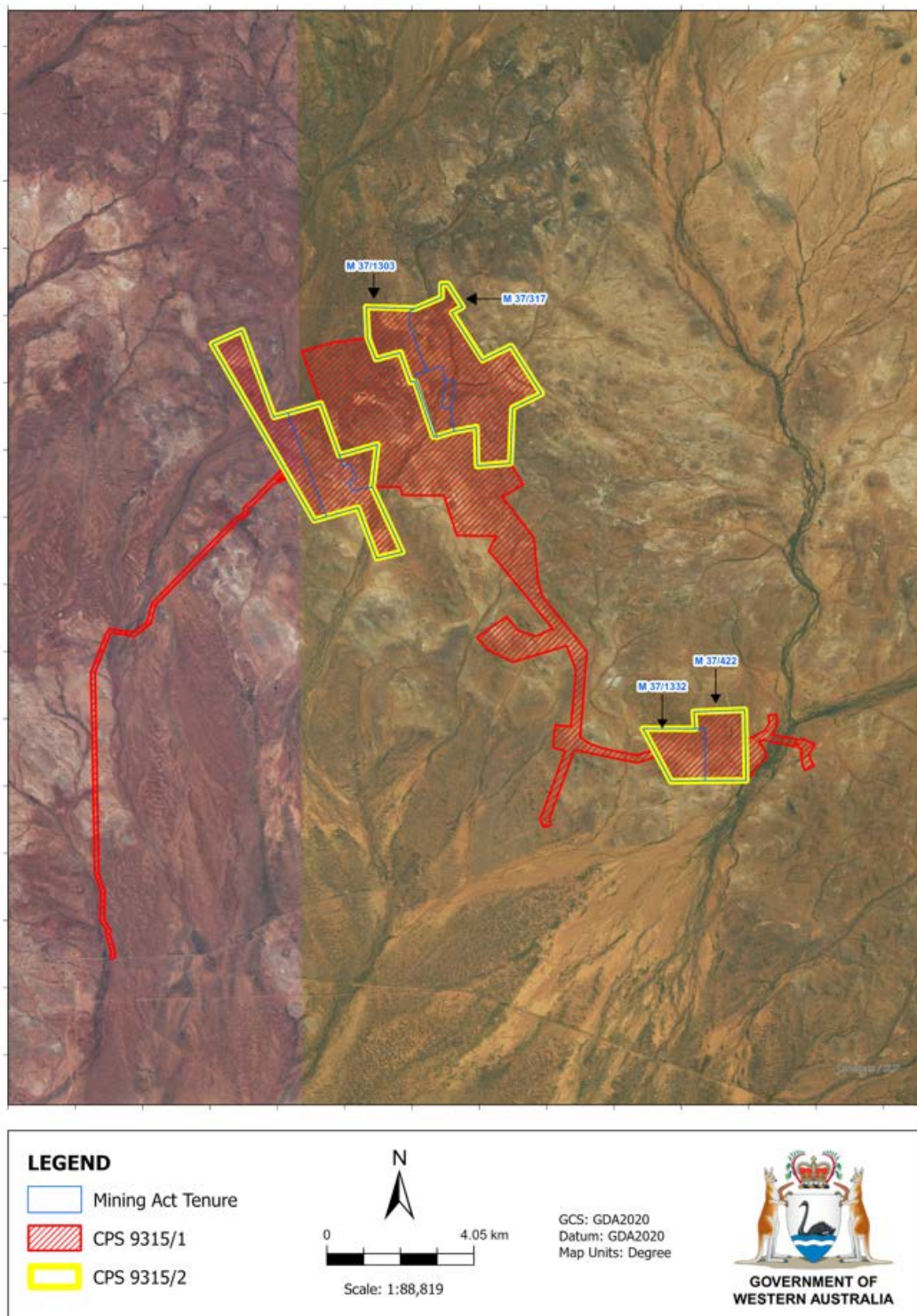


Figure 1. Map of the application area. The yellow area indicates the area within which conditional authorised clearing can occur under the granted clearing permit CPS 9315/2. Red area indicates previous clearing permit CPS 9315/1.

2.3. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix A) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values. As a result of this review, the assessment against the Clearing Principles has not changed significantly from the Clearing Permit Decision Report CPS 9315/1.

The previous assessment against the Clearing Principles identified that the native vegetation proposed to be cleared is 'at variance' with Principle (f); 'may be at variance' with Principle (b) and (g); 'not at variance' with Principle (e) and is 'not likely to be at variance' with the remaining clearing principles. The consideration of the impacts associated with Clearing Principles (b), (f)

and (g), and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, are set out below. Detailed assessment of the remaining Clearing Principles can be found in the decision report for CPS 9315/1.

2.3.1 Biological values (fauna habitat) – Clearing Principle (b)

Assessment

There have been previous records of *Leipoa ocellata* (malleefowl - vulnerable) within 18 kilometres of the application area (GIS Database), however the application area itself is considered to be of low suitability for this species due to lack of leaf litter for nest building. Mulga woodland habitats were seen to have leaf litter, however these areas are of low value for nest construction due to their patchy occurrence and mostly open canopy (360 Environmental, 2021).

Polytelis alexandrae (Princess Parrot - vulnerable) is not present within the study area, however it is considered possible that the Princess Parrot may occur in the study area occasionally when conditions are favourable, particularly following rainfall in its core range in the arid areas east and north of the application area (360 Environmental, 2021).

Conclusion

For the reasons set out above, the proposed clearing is not likely to be at variance with Clearing Principle (b), and to address the above impacts, the following management measure will be required as a condition on the clearing permit:

- undertake slow, progressive one-directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity.

2.3.2 Environmental values (land and water resources) – Clearing Principles (f) and (g)

Assessment

There are no permanent watercourses or wetlands within the area proposed to clear (GIS Database). However, several ephemeral creek lines intersect the application area, with Cardinia Creek being the most prominent (GIS Database). Two vegetation associations were identified as growing in association with these creek lines – *Acacia aneura* and *Acacia burkittii*. Both species are listed as *Not Threatened* (Florabase, 2025). Creek lines in the region are dry for most of the year, only flowing briefly immediately following significant rainfall. The proposed activities within the creek lines are construction of access roads and pit expansion (360 Environmental, 2021). As long as the proposed clearing is unlikely to significantly impact surface water flow, the proposed clearing is unlikely to significantly impact riparian vegetation or local watercourses.

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

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 application area (GIS Database). 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 Jundee land system is also mostly protected from soil erosion by gravelly mantles (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 application area (GIS Database).

Conclusion

For the reasons set out above, the proposed clearing is at variance to Principle (f) and may be at variance with Clearing Principle (g). However given the majority of the land systems within the application area have susceptibility to erosion, the proposed clearing has the potential to cause land degradation, especially when drainage lines are disturbed. Provided that the clearing does not impede water flow, it is not likely to have a significant impact on riparian vegetation and watercourses in the local area.

Conditions

To address the above impacts, the following management measures will be required as conditions on the clearing permit:

- staged clearing to prevent localised erosion;
- avoid the clearing of riparian vegetation, ensuring the existing surface flow is maintained, or reinstated downstream into existing natural drainage lines.

2.4. ; Relevant planning instruments and other matters

The clearing permit amendment application was advertised on 22 March 2024 by the Department of Energy, Mines, Industry Regulation and Safety inviting submissions from the public. No submissions were received in relation to this application.

There are two native title claims over the area under application (DPLH, 2025). 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*.

Other relevant authorisations required for the proposed land use include:

- A Programme of Work approved under the *Mining Act 1978*.
- A Mining Proposal / Mine Closure Plan approved under the *Mining Act 1978*.

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.

Appendix A – Site Characteristics

A.1. Site Characteristics

• Characteristic	Details																												
Local context	The area proposed to be cleared is part of an expansive tract of native vegetation in the intensive / extensive land use zone of Western Australia. It is surrounded by the native vegetation of the Murchinson bioregion.																												
Ecological linkage	According to aerial imagery the application area does not form part of any formal or informal ecological linkages (GIS Database).																												
Conservation areas	The application area does not form part of any known or mapped conservation areas. The closest conservation area recorded as Melita calcrete groundwater assemblage type on Raeside palaeodrainage on Melita (Sons of Gwalia) Station. Located approximately 27 kilometres southwest from the application area (GIS Database).																												
Vegetation description	The vegetation of the application area is broadly mapped as the following Beard vegetation associations (GIS Database): 18: Low woodland; mulga (<i>Acacia aneura</i>); and 39: Shrublands; mulga scrub A flora and vegetation survey was conducted over the application over two seasons (October 2018 and February 2019) by Stantec, and a desktop assessment completed in June 2021 by 360 Environmental. The following vegetation associations were recorded within the application area (360 environmental, 2021): <table> <tr> <th>Vegetation Association</th><th>Description</th></tr> <tr> <td>Mulga Woodlands over Perennial Non Halophytic Shrubs on hills and plains</td><td>aArEpLoU: Grasses: <i>Acacia aneura</i>, <i>A. ramulosa</i>, <i>Eremophila platycalyx</i> subsp. <i>Leonora</i> (Morrissey J. 252), <i>Ptilotus obovatus</i> (Upright form) Shrubland and grasses;</td></tr> <tr> <td></td><td>AaPoUMt: <i>Acacia aneura</i> (forms), <i>Ptilotus obovatus</i> (Upright form), <i>Maireana triptera</i> Shrubland;</td></tr> <tr> <td></td><td>Dead AaPoUMt: Dead vegetation, formerly <i>Acacia aneura</i> (forms), <i>Ptilotus obovatus</i> (Upright form), <i>Maireana triptera</i> Shrubland;</td></tr> <tr> <td></td><td>AaMsSsNPoG: <i>Acacia aneura</i>, <i>Maireana sedifolia</i>, <i>Scaevola spinescens</i> Narrow leaf spiny form <i>Ptilotus obovatus</i> (typical Goldfields form) Shrubland;</td></tr> <tr> <td></td><td>AbSafAmpMt: <i>Acacia burkittii</i>, <i>Senna artemisioides</i> subsp. <i>filifolia</i>, <i>Maireana</i> spp. Shrubland;</td></tr> <tr> <td></td><td>AaEpLSppPoUMt: <i>Acacia aneura</i> (forms) over <i>Eremophila platycalyx</i> subsp. <i>Leonora</i> (Morrissey J. 252) over <i>Senna</i> spp. over <i>Ptilotus obovatus</i> (Upright form) and <i>Maireana triptera</i> Shrubland;</td></tr> <tr> <td></td><td>AaEmp: <i>Acacia aneura</i> (forms) over <i>Eremophila</i> spp. (<i>E. margarethae</i>, <i>E. compacta</i> subsp. <i>compacta</i>, <i>E. simulans</i> subsp. <i>simulans</i> or <i>E. annosicaulis</i> P3) over <i>Ptilotus schwartzii</i> Shrubland;</td></tr> <tr> <td></td><td>SIMS AaEISe: Stony Ironstone Mulga Shrubland <i>Acacia aneura</i>, <i>Eremophila latrobei</i>, <i>Sida ectogama</i> Shrubland on summits of chert, quartz hills and slopes;</td></tr> <tr> <td></td><td>SIMS AaPoUSe: Stony Ironstone Mulga Shrubland <i>Acacia aneura</i>, <i>Ptilotus obovatus</i> (Upright form), 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	AaArAqEp: <i>Acacia aneura</i> (sens. lat.), <i>Acacia ramulosa</i>, <i>Acacia quadrimarginea</i>, <i>Eremophila platycalyx</i> subsp. <i>Leonora</i> (Morrissey J. 252) Shrubland; SAES: Stony Acacia - <i>Eremophila</i> Shrubland; HPDS: Hardpan Plain, deflation zone; HPMS: Hardpan Mulga Shrubland; AaPoGMt: <i>Acacia aneura</i>, <i>Maireana triptera</i>, <i>Ptilotus obovatus</i> Goldfields Form Shrubland over <i>Aristida contorta</i> Mulga Shrublands / Woodlands over Perennial Grasses on Plains MUWA: Mulga-Wanderrie (<i>Acacia aneura</i>, <i>Eragrostis eriopoda</i>) Grassland WABS: Wanderrie Bank Grassy Shrublands (<i>Eragrostis eriopoda</i>) Grassland; Acacia Woodlands over Shrubs and Grasses in Major Drainage Lines and Groves DRMS: Drainage Line Mulga (<i>Acacia aneura</i> sens. lat.) Woodland; DRAbS: Drainage line <i>Acacia burkittii</i> Woodland; GRMU: Groved Mulga Woodland; Acacia (other than Mulga) Shrublands on Stony Hills Amp: <i>Acacia</i> sp. Marshall Pool (G. Cockerton 3024) Shrubland; AmpAsAa: <i>Acacia</i> sp. Marshall Pool (G. Cockerton 3024), <i>A. sibirica</i>, <i>Acacia aneura</i>, <i>A. burkittii</i> Shrubland; AdAspMPPoG: <i>Acacia doreta</i> short phyllode form (M. Stone & S. Colwill WB34381), <i>Acacia</i> sp. Marshall Pool (G. Cockerton 3024) Open Woodland <i>Ptilotus obovatus</i> (Goldfields form) Shrubland; AbPoG: <i>Acacia burkittii</i>, <i>Ptilotus obovatus</i> (Goldfields form) Shrubland; Acacia papyrocarpa Woodlands ApTdS: <i>Acacia papyrocarpa</i> Open Low Woodland, <i>Tecticornia disarticulata</i> Shrubland; ApEsMssp: <i>Acacia papyrocarpa</i> Open Low Woodland, <i>Eremophila scoparia</i> and <i>Maireana</i> spp. Shrubland; ApPoUMt: <i>Acacia papyrocarpa</i> Open Low Woodland, <i>Ptilotus obovatus</i> (Upright form), <i>Maireana triptera</i> Shrubland and grasses; ApMt: <i>Acacia papyrocarpa</i> Open Low Woodland, <i>Maireana pyramidata</i> Shrubland; Acacia victoriae Shrubland over Chenopods on Calcrete Plains AvS: <i>Acacia victoriae</i> Shrubland; Perennial Grasslands EyC: <i>Eragrostis</i> sp. Yeelirrie Calcrete (S. Regan LCH 26770) Hummock Grassland on Calcrete; NmHG: <i>Neurachne munroi</i> Hummock Grassland on Mudstone; Hakea preissii and/or Halophytic Chenopod Shrublands HpTdMpS: <i>Hakea preissii</i>, <i>Maireana pyramidata</i>, <i>Tecticornia disarticulata</i> Shrubland; HpMpCs: <i>Hakea preissii</i>, <i>Maireana pyramidata</i>, <i>Cratystylis subspinescens</i> Shrubland HpMpEs: <i>Hakea preissii</i>, <i>Maireana pyramidata</i>, <i>Eremophila scoparia</i> Shrubland; HpPoGMt: <i>Hakea preissii</i>, <i>Ptilotus obovatus</i> (Goldfields form), <i>Maireana triptera</i> Shrubland; HpMpMsp59: <i>Hakea preissii</i>, <i>Maireana pyramidata</i>, <i>Maireana tomentosa</i> (type 1 WB38650) complex Shrubland and grasses; HpEsMt: <i>Hakea preissii</i>, <i>Eremophila scoparia</i>, <i>Maireana triptera</i> Shrubland MtFsp: <i>Maireana triptera</i>, <i>Frankenia</i> spp. Low Open Shrubland; MpMg: <i>Maireana pyramidata</i>, <i>M. georgei</i> Shrubland; TdFsppMt: <i>Tecticornia disarticulata</i>, <i>Surreya diandra</i>, <i>Frankenia setosa</i>, <i>Maireana tomentosa</i> (type 1 WB38650) complex Shrubland;

• Characteristic	Details
	Mt, Td: <i>Maireana tomentosa</i> (type 1 WB38650) <i>Tecticornia disarticulata</i> Shrubland; Fspp: <i>Frankenia spp.</i> Shrubland; AmCs: <i>Acacia masliniana</i>, <i>Cratystylis subspinescens</i> Shrubland; Cpn-B: Bare claypan, no vegetation; Casuarina pauper Woodland on Calcrete Outcrops CpW: <i>Casuarina pauper</i> Woodland over Chenopods on Calcrete outcrops; Claypans CPN-G: Grassy Claypan (<i>Eragrostis xerophila</i> Grassland); Gilgai: <i>Pittosporum angustifolium</i>, <i>Acacia tetragonophylla</i> and <i>A. victoriae</i> Shrubland over Claypan Grasses; Breakaway Complex EsFsppSspp: <i>Eremophila scoparia</i>, <i>Frankenia spp.</i> Shrubland with <i>Sclerolaena diacantha</i>
Vegetation condition	The vegetation survey (360 Environmental, 2021) indicated the vegetation within the proposed clearing area ranges from excellent to completely degraded (Keighery, 1994).
Climate and landform	The application area is located in an arid zone with an annual average rainfall (Shire of Leonora) of approximately 221.1 millimetres (BoM, 2025).
Soil description	The soil in the application area is mapped as calcareous stony plains, sand plains with red shallow loams, hardpan plains with variable gravelly mantles and sandy banks (DPIRD, 2025).
Land degradation risk	The application area falls within the below mentioned land soil systems, as described by Pringle et al., (1994): Jundee system: hardpan plains with variable gravelly mantles and minor sandy branks supporting weakly groved mulga bushes (360 Environmental, 2021). An increase in disturbance can cause soil erosion in sensitive areas (Pringle et al., 1994). Nubev System: gently undulating stony plains, minor mylonitic low rises and drainage floors supporting mulga and halophytic shrublands (360 Environmental, 2021). Stony mantles usually protect soils on hills, ridges and erosional plains but increased disturbance can cause erosion on sensitive areas (Pringle et al., 1994). Gundockerta System: extensive, gently undulating calcareous stony plains supporting bluebush shrublands (360 Environmental, 2021). A decline in perennial shrub cover and water erosion are the primary causes of serious soil degradation (Waddell et al., 2023). Laverton System: greenstone hills and ridges with acacia shrublands (360 Environmental, 2021). Leonora System: low greenstone hills and stony plains supporting mixed chenopod shrublands (360 Environmental, 2021). Both the Laverton and Leonora systems are susceptible to erosion when in poor condition (Waddell et al., 2023). Overgrazing can result in bush mounds being lost through wind and water erosion (Waddell et al., 2023).
Waterbodies	The desktop assessment and aerial imagery indicated that there are several minor, non-perennial creek lines that run through the application area. Cardinia Creek runs through the application area and is considered a minor, non-perennial creek line.
Hydrogeography	The application area is not located within any Surface Water Areas (GIS Database). GIS Database records indicate that the application area is located within the Goldfields Groundwater Area and within the Raeside Subarea (360 Environmental, 2021). Leonora Water Reserve, is the closest Public Drinking Water Source Area, and is situated approximately 9.22 kilometres from the application area (GIS Database).
Flora	No Threatened flora species have been identified within the application area (GIS Database). Three Priority Three species were recorded during the flora survey; <i>Acacia</i> sp. Marshall Pool, <i>Eremophila annosocaulis</i> and <i>Cratystylis centralis</i> (Western Botanical, 2019).
Ecological communities	No Threatened Ecological Communities or Priority Ecological Communities were found within the application area (360 Environmental, 2021). The nearest recorded Priority Ecological Community is located approximately 30 kilometres in a south westerly direction of the application area (GIS Database).
Fauna	During a field survey conducted in April 2019, no conservation significant species were identified however, three were recorded on secondary evidence (360 Environmental, 2021), these species included the Long- tailed Dunnart, <i>Bettongia lesueur</i> subsp (Burrowing Bettong), and the <i>wopilkara</i> – <i>Leporillus conditor</i> (Greater Stick-nest Rat).
Fauna habitat	The following fauna habitat types were identified within the application area (360 Environmental, 2021):

• Characteristic	Details																
	<table> <tr> <th>Fauna Habitat</th><th>Description</th></tr> <tr> <td>Mulga woodland on plain</td><td>Open to sparse woodland or shrubland of Mulga (<i>Acacia aneura</i> group) or Bastard Mulga (<i>A. papyrocarpa</i>) over varying mid- and understorey of lower shrubs and/or grasses.</td></tr> <tr> <td>Shrubland on plain</td><td>Open to sparse shrubland dominated by shrub Mulga, other <i>Acacia</i> species, <i>Hakea</i>, chenopods, or hummock grasses on a range of substrates.</td></tr> <tr> <td>Acacia shrubland on stony hills</td><td>Rolling hills with gravel or cobble substrate, with shrubland vegetation dominated by <i>Acacia</i> other than Mulga.</td></tr> <tr> <td>Acacia woodland in drainage lines and groves</td><td>Drainage lines with associated riparian vegetation, usually, Mulga or other <i>Acacia</i> over variable understorey cover, often dominated by dense grass cover nearer to drainage line.</td></tr> <tr> <td>Mulga woodland on stony hills</td><td>Mulga (<i>Acacia aneura</i> group) woodland on hill slopes and tops; also includes patches of <i>Casuarina pauper</i> woodland on calcrete outcrop.</td></tr> <tr> <td>Outcropping and breakaway</td><td>Outcrop of calcrete, basalt, or other rock types with boulder piles, small caves, or crevices on hilltops, slopes, and breakaways; woodland or shrubland vegetation.</td></tr> <tr> <td>Vegetated gilgai/claypan</td><td>Vegetated gilgai/claypan: Drainage foci with clay soils and perennial grasses, and with or without shrub vegetation.</td></tr> </table>	Fauna Habitat	Description	Mulga woodland on plain	Open to sparse woodland or shrubland of Mulga (<i>Acacia aneura</i> group) or Bastard Mulga (<i>A. papyrocarpa</i>) over varying mid- and understorey of lower shrubs and/or grasses.	Shrubland on plain	Open to sparse shrubland dominated by shrub Mulga, other <i>Acacia</i> species, <i>Hakea</i> , chenopods, or hummock grasses on a range of substrates.	Acacia shrubland on stony hills	Rolling hills with gravel or cobble substrate, with shrubland vegetation dominated by <i>Acacia</i> other than Mulga.	Acacia woodland in drainage lines and groves	Drainage lines with associated riparian vegetation, usually, Mulga or other <i>Acacia</i> over variable understorey cover, often dominated by dense grass cover nearer to drainage line.	Mulga woodland on stony hills	Mulga (<i>Acacia aneura</i> group) woodland on hill slopes and tops; also includes patches of <i>Casuarina pauper</i> woodland on calcrete outcrop.	Outcropping and breakaway	Outcrop of calcrete, basalt, or other rock types with boulder piles, small caves, or crevices on hilltops, slopes, and breakaways; woodland or shrubland vegetation.	Vegetated gilgai/claypan	Vegetated gilgai/claypan: Drainage foci with clay soils and perennial grasses, and with or without shrub vegetation.
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Vegetated gilgai/claypan	Vegetated gilgai/claypan: Drainage foci with clay soils and perennial grasses, and with or without shrub vegetation.																

Appendix B - References and databases

B.1. GIS datasets

Publicly available GIS Databases used (sourced from www.data.wa.gov.au):

- Aboriginal Heritage Places (DPLH-001)
- Clearing Regulations - Environmentally Sensitive Areas (DWER-046)
- Clearing Regulations - Schedule One Areas (DWER-057)
- DBCA - Legislated Lands and Waters (DBCA-011)
- IBRA Vegetation Statistics
- Native Vegetation Extent (DPIRD-005)
- Pre-European Vegetation (DPIRD-006)
- Soil Landscape Mapping - Best Available (DPIRD-027)
- Soil Landscape Mapping - Rangelands (DPIRD-063)
- Townsites (LGATE-248)
- WA Now Aerial Imagery

Restricted GIS Databases used:

- Threatened and Priority Flora (TPFL)
- Threatened and Priority Flora (WAHerb)
- Threatened and Priority Fauna
- Threatened and Priority Ecological Communities
- Threatened and Priority Ecological Communities (Buffers)

2. References

360 Environmental (2021) Native Vegetation Clearing (Purpose) Permit: Supporting Documentation. Report prepared for Navigator Mining Pty Ltd by 360 Environmental, June 2021.

Bureau of Meteorology (BoM) (2025) Bureau of Meteorology Website – Climate Data Online, Weather Station. Bureau of Meteorology. <https://reg.bom.gov.au/climate/data/> (Accessed 1 May 2025).

Department of Primary Industries and Regional Development (DPIRD) (2025) NRInfo Digital Mapping. Department of Primary Industries and Regional Development. Government of Western Australia. <https://dpiird.maps.arcgis.com/apps/webappviewer/index.html?id=662e8cbf2def492381fc915aaf3c6a0f> (Accessed 25 March 2025).

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- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- Pringle, H J, Gilligan, S A, and van Vreeswyk, A M. (1994) *An inventory and condition survey of rangelands in the north-eastern Goldfields, Western Australia*. Department of Primary Industries and Regional Development, Western Australia, Perth. Technical Bulletin 87 part 2.1. https://library.dpird.wa.gov.au/tech_bull/5
- Waddell, P.A., Thomas, P.W.E., Fletcher, W.J., Ryan, K.G., Foster, J.E., Stretch, J.K., and Addison, J.S., (2023) 'Pasture condition guides for the southern rangelands, including the Gascoyne, Murchison and Goldfields-Nullarbor', Bulletin 4913, Department of Primary Industries and Regional Development, Western Australian Government.
- Western Australian Herbarium (2025-) FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions, Western Australia. <https://florabase.dpaw.wa.gov.au/> (Accessed 16 April 2025).
- Western Botanical (2019) Flora and Vegetation Assessment, Leonora Gold Project. Report prepared for Kin Mining Pty Ltd, by Western Botanical, June 2019.

3. 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
DEMIRS	Department of Energy, Mines, Industry Regulation and Safety ²⁰²
DER	Department of Environment Regulation, Western Australia (now DWER)
DMIRS	Department of Mines, Industry Regulation and Safety, Western Australia (now DEMIRS)
DMP	Department of Mines and Petroleum, Western Australia (now DEMIRS)
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.

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.
- (c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened 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 the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.