



Clearing Permit Decision Report

1. Application details and outcomes

1.1. Permit application details

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|-------------------------------|--|
| Permit number: | 9506/1 |
| Permit type: | Purpose Permit |
| Applicant name: | Kumarina Resources Pty Ltd |
| Application received: | 24 November 2021 |
| Application area: | 100 hectares |
| Purpose of clearing: | Mineral Production |
| Method of clearing: | Mechanical Removal |
| Tenure: | Mining Lease 39/399 Mining Lease 39/400 Mining Lease 39/1068 |
| Location (LGA area/s): | Shire of Leonora |
| Colloquial name: | Malcolm Challenger Project |

1.2. Description of clearing activities

Kumarina Resources Pty Ltd proposes to clear up to 100 hectares of native vegetation within a boundary of approximately 177 hectares, for the purpose of mining related infrastructure. The project is located approximately 46 kilometres east of Leonora, within the Shire of Leonora.

The application is to allow for mining operations in the Malcolm Challenger Mine site. The application area has been disturbed since 2008 by exploration and mining activities. After the mining activities, the land was rehabilitated for pastoral activities, some of these rehabilitation efforts included revegetation of the site.

1.3. Decision on application and key considerations

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|-----------------------|-----------------------------------|
| Decision: | Grant |
| Decision date: | 23 June 2022 |
| Decision area: | 100 hectares of native vegetation |

1.4. Reasons for decision

This clearing permit application was made in accordance with section 51E of the *Environmental Protection Act 1986* (EP Act) and was received by the Department of Mines, Industry Regulation and Safety (DMIRS) on 24 November 2021. DMIRS advertised the application for a public comment for a period of 21 days, and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (Appendix B), relevant datasets (Appendix F), supporting information provided by the applicant (Appendix A) including the results of a flora and vegetation survey (Appendix E), the clearing principles set out in Schedule 5 of the EP Act (Appendix C), proposed avoidance and minimisation measures (Section 3.1), relevant planning instruments and any other matters considered relevant to the assessment (Section 3.3).

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;
- loss of riparian vegetation; and
- potential land degradation in the form of water erosion.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined the proposed clearing can be minimised and managed to be unlikely 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;
- staged clearing to minimise erosion; and
- avoid impacts to riparian vegetation and maintain surface water flow.

2. Legislative context

The clearing of native vegetation in Western Australia is regulated under the EP Act and the Environmental Protection (Clearing of Native Vegetation) Regulations 2004 (Clearing Regulations).

In addition to the matters considered in accordance with section 51O of the EP Act (see Section 1.4), the Delegated Officer has also had regard to the objects and principles under section 4A of the EP Act, particularly:

- the precautionary principle
- the principle of intergenerational equity
- the principle of the conservation of biological diversity and ecological integrity.

Other legislation of relevance for this assessment includes:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Mining Act 1978* (WA)

The key guidance documents which inform this assessment are:

- *A guide to the assessment of applications to clear native vegetation* (DER, December 2013)
- *Procedure: Native vegetation clearing permits* (DWER, October 2021)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)
- Technical guidance – *Terrestrial Fauna Surveys for Environmental Impact Assessment* (EPA, 2016)

3. Detailed assessment of application

3.1. Avoidance and mitigation measures

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. Although a drainage line transects across the application area, the proponent has provided maps of the intended clearing footprint, which will largely avoid the drainage line and only affect a small amount of riparian vegetation. In order to ensure this avoidance occurs, a vegetation management condition will be placed on the clearing permit.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix B) and the extent to which the impacts of the proposed clearing present a risk to biological, conservation, or land and water resource values.

The assessment against the clearing principles identified that the impacts of the proposed clearing present a risk to biological values (Priority flora, conservation significant fauna), land and water resources. The consideration of these impacts, and the extent to which they can be managed through conditions applied in line with sections 51H and 51I of the EP Act, is set out below.

3.2.1. Biological values (flora) – Clearing Principle (a)

Assessment

The field assessment conducted by Botanica Consulting did not record any Priority flora within the area. However, two Priority flora species are considered likely to occur within the application area (see section B.2). These two species have several records outside the application area. (GIS Database; Western Australian Herbarium, 1998-). *Hemigenia exilis* (Priority 4) has approximately 23 records across six local government areas two IBRA subregions, while *Hybanthus floribundus* subsp. *chloroxanthus* (Priority 3) has approximately 13 records across three local government areas (Western Australian Herbarium, 1998-). Even though a targeted survey was not conducted for these species, they are both well represented outside the application area, and it is unlikely that any individuals found within the application area would represent a significant population for these flora species.

The field assessment by Botanica Consulting did not identify any weeds within the application area but it identified eight introduced species likely to occur in the vicinity of the application area. None of these species are Declared Pests or Weeds of National Significance (WONS). Weeds have the potential to alter the biodiversity of an area, competing with native vegetation for available resources and making areas more fire prone. Care should be taken to ensure that weeds are not introduced into the area as the result of clearing activities.

Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing on habitat for Priority flora is not likely to be significant. There is potential for weeds being present in the vicinity of the application area and the proposed clearing has the potential to exacerbate the spread of weeds.

Conditions

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

- Take hygiene steps to minimise the risk of the introduction and spread of weeds.

3.2.2. *Biological values (fauna) – Clearing Principle (b)*

Assessment

The field assessment conducted by Botanica Consulting did not record any conservation significant fauna within the application area. However, the following conservation significant species are considered to be possibly occurring within the application area:

- *Leipoa ocellata* (Mallefowl) - Vulnerable
- *Falco hypoleucos* (Grey Falcon) – Vulnerable
- *Falco peregrinus* (Peregrine Falcon) – Specially Protected

Although these three conservation significant fauna species are considered to be possibly occurring within the application area, the habitats in the application area are marginal in extent and quality, and they are unsuitable for breeding or foraging for these species (Botanica Consulting, 2021, GIS Database). The occurrence of these fauna species is likely to be only for short periods of time as infrequent vagrants, therefore the habitats found within the application area is unlikely to represent significant habitat for fauna (Botanica Consulting, 2021).

Conclusion

For the reasons set out above, it is considered that the impacts of the proposed clearing on habitat for fauna is not likely to be significant.

Conditions

No conditions are required

3.2.3. *Water and land resources – Clearing Principles (f) and (g)*

Assessment

There are three ephemeral drainage lines intersecting the northern side of the application area. Vegetation type DD-AS1 (refer to section B.1) grows in association with these drainage lines. Clearing within the application area will impact riparian vegetation.

Within the Hootanui land system, narrow drainage tracts and breakaway footslopes are susceptible to water erosion in areas where perennial shrub cover is substantially reduced or the soil surface is disturbed (Pringle et al., 1994). Within the Nubev land system, drainage zones are moderately susceptible to soil erosion, particularly where perennial shrub cover is substantially reduced or the soil surface is disturbed (Pringle et al., 1994). Clearing within the application area may lead to land degradation in the form of water erosion

Conclusion

Based on the above assessment, the proposed clearing will have an impact on riparian vegetation and drainage lines are susceptible to water erosion. However, drainage lines are common throughout the region and the vegetation associated with them is well represented outside of the application area. In addition to this, the proponent intends to avoid clearing within the drainage line (see section 3.1). These impacts can be appropriately managed by the permit conditions.

Conditions

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

- A vegetation management condition requiring the avoidance of impacts to riparian vegetation and the maintenance of surface water flows.
- A staged clearing condition which requires areas are utilised within 3 months of clearing being undertaken.

3.3. **Relevant planning instruments and other matters**

The clearing permit application was advertised on 14 December 2021 by the Department of Mines, Industry Regulation and Safety inviting submissions from the public. No submissions were received in relation to this application.

There is one native title claim (WC2019/002) over the area under application (DPLH, 2022). This claim has been registered with the National Native Title Tribunal on behalf of the claimant group. However, the mining tenures 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 (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.

Other relevant authorisations required for the proposed land use include:

- 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.

End

Appendix A. Additional information provided by applicant

| Summary of comments | Consideration of comment |
|--|--|
| Reconnaissance Flora and Basic Fauna Survey conducted by Botanica Consulting in 2021 | This document was used for the assessment of clearing principles a, b, c, d and e. |

Appendix B. Site characteristics

B.1. Site characteristics

| Characteristic | Details |
|------------------------|--|
| Local context | The area proposed to be cleared is part of an expansive tract of native vegetation in the extensive land use zone of Western Australia. It is surrounded by sparse native vegetation and the southern boundary of the application area is adjacent to Old Laverton Road (GIS Database). The dominant land use of the subregion is for grazing native pastures and the survey area is located within the Minara Pastoral Lease (Botanica Consulting, 2021). |
| Ecological linkage | According to available databases, the application area does not contain of any known or mapped ecological linkages. |
| Conservation areas | There are no conservation areas within or near the application area (Botanica Consulting, 2021; GIS Database). |
| Vegetation description | <p>The vegetation of the application area is broadly mapped as the following Beard vegetation association: 39: Shrublands; mulga scrub (GIS Database).</p> <p>A flora and vegetation survey was conducted over the application area by Botanica Consulting during May, 2021. The following vegetation communities were recorded within the application area (Botanica Consulting, 2021):</p> <p>RP-AS1: <i>Acacia aneura</i>, <i>Hakea preissii</i> and <i>Santalum acuminatum</i> sparse tall shrubland over <i>Atriplex bunburyana</i> and <i>Cratystylis subspinescens</i> sparse shrubland over <i>Maireana triptera</i>, <i>M. georgei</i> and <i>Ptilotus obovatus</i> var. <i>obovatus</i> low sparse shrubland. On rocky plain.</p> <p>RP-AS2: <i>Acacia aneura</i> sparse tall shrubland over <i>Eremophila platycalyx</i> subsp. <i>leonora</i> and <i>Cratystylis subspinescens</i> sparse shrubland over <i>Maireana triptera</i>, <i>M. georgei</i> and <i>Tecticornia disarticulata</i> low sparse chenopod shrubland. On rocky plain.</p> <p>DD-AS1: <i>Acacia incurvaneura</i>, <i>A. aneura</i> and <i>A. caesaneura</i> tall shrubland over <i>Acacia tetragonophylla</i>, <i>Teucrium teucriiflorum</i> and <i>Senna artemisioides</i> subsp. <i>artemisioides</i> open shrubland over <i>Maireana triptera</i>, <i>M. georgei</i> and <i>Ptilotus obovatus</i> var. <i>obovatus</i> low open shrubland. On drainage depression.</p> |
| Vegetation condition | <p>The vegetation survey (Botanica Consulting, 2021) and aerial imagery indicate the vegetation within the proposed clearing area is in Good to Completely degraded (Keighery, 1994) condition.</p> <p>The full Keighery (1994) condition rating scale is provided in Appendix D.</p> <p>Botanica Consulting's mapping of the vegetation condition within the survey area is available in Appendix E.</p> |
| Climate and landform | The application area is located in an arid region with a low average rainfall of 236.4 millimetres per year (BoM, 2022). The landforms found within the application area are rocky plains and drainage depressions (Botanica Consulting, 2021). |
| Soil description | The soil within the application area is mapped as soil unit BE15 (GIS Database). This soil unit is described as gently undulating to low hilly pediments with stony and gravelly pavements, and traversed by numerous seasonal streams: chief soils seem to be shallow earthy loams with shallow red earths, both underlain by red-brown hardpan (Northcote et al, 1960-68). |
| Land degradation risk | The application area falls within the Hootanui and Nubev land systems (Botanica Consulting, 2021; GIS Database) The Hootanui land system is described as breakaways, hills and ridges with saline gravelly and stony lower plains supporting scattered halophytic low shrublands (DPIRD, 2022). The Nubev land system is described as gently undulating stony plains, minor |

| Characteristic | Details |
|------------------------|--|
| | limonitic low rises and drainage floors supporting mulga and halophytic shrublands (DPIRD, 2022). |
| Waterbodies | The desktop assessment and aerial imagery indicate that there are no permanent or ephemeral waterbodies within the application area. However, three minor, ephemeral watercourses transect the northern section of the area proposed to be cleared (Botanica Consulting, 2021; GIS Database). |
| Hydrogeography | The application area is located within the Goldfields Groundwater Area which is legislated by the RIWI Act 1914 (GIS Database). The groundwater salinity within the application area is of 1000-3000 milligrams per litre total dissolved solids which is described as brackish to saline (GIS Database). |
| Flora | The desktop review from Botanica Consulting recorded 372 flora species within a 40 kilometres radius of the survey area. There are records of 16 conservation significant flora species recorded within a 40 kilometres radius of the survey area (Botanica Consulting, 2021). Two of these species are considered likely to occur in the application area (Botanica Consulting, 2021). The reconnaissance flora survey conducted by Botanica Consulting in May 2021 did not record any conservation significant flora within the survey area. |
| Ecological communities | The application area does not fall within any known Threatened Ecological Community (TEC) or a Priority Ecological Community (PEC) (Botanica Consulting, 2021; GIS Database). The nearest record is a Priority 1 PEC located approximately 34 kilometres northeast of the application area (GIS Database). |
| Fauna | The desktop review from Botanica Consulting recorded 203 terrestrial vertebrate fauna species within 40 kilometres of the survey area. There are records of 11 conservation significant fauna species in the regional area. Three of these species are considered as possibly to occurring within the application area (Botanica Consulting, 2021). The reconnaissance fauna survey conducted by Botanica Consulting in May 2021 did not record any conservation significant fauna within the survey area. |

B.2. Flora analysis table

Relevant records were identified in initial desktop to warrant further consideration.

With consideration for the site characteristics set out above, relevant datasets (see Appendix F.1), and biological survey information, impacts to the following conservation significant flora required further consideration.

| Species name | Conservation status | Suitable habitat features? [Y/N] | Suitable vegetation type? [Y/N] | Suitable soil type? [Y/N] | Distance of closest record to application area (km) | Are surveys adequate to identify? [Y, N, N/A] |
|--|---------------------|----------------------------------|---------------------------------|---------------------------|---|---|
| <i>Hybanthus floribundus</i> subsp. <i>chloroxanthus</i> | P3 | Y | Y | Y | 4.2 km | N |
| <i>Hemigenia exilis</i> | P4 | N | Y | Y | 1.6 km | N |

| | | | |
|--|---|---|--------|
| <i>Hybanthus floribundus</i> subsp. <i>chloroxanthus</i> | Dark red-brown soil, never sandy, rich in iron oxide, laterite. Rocky areas, creek banks, along drainage lines. | Records within 10 km, habitat likely to be present. | Likely |
| <i>Hemigenia exilis</i> | Laterite. Breakaways, slopes. | Records within 10 km, habitat likely to be present. | Likely |

Appendix C. Assessment against the clearing principles

| Assessment against the clearing principles | Variance level | Is further consideration required? |
|--|----------------|------------------------------------|
| Environmental value: biological values | | |

| Assessment against the clearing principles | Variance level | Is further consideration required? |
|--|------------------------------|--|
| <p><u>Principle (a):</u> <i>“Native vegetation should not be cleared if it comprises a high level of biodiversity.”</i></p> <p><u>Assessment:</u></p> <p>Only 36 vascular flora species were recorded within the application area (Botanica Consulting, 2021). Vegetation identified within the survey area is not considered to be of high biological diversity and is well represented outside of the survey area (Botanica Consulting, 2021).</p> <p>The survey area does not occur within any mapped PECs (Botanica Consulting, 2021; GIS Database).</p> | Not likely to be at variance | Yes <i>Refer to section 3.2.1</i> |
| <p><u>Principle (b):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>The application area contains two broad scale terrestrial fauna habitats:</p> <ul style="list-style-type: none"> • <i>Acacia</i> sparse shrubland on rocky plain • <i>Acacia</i> shrubland in drainage depression. <p>These habitats are unlikely to be significant for fauna of the region (Botanica Consulting, 2021).</p> | Not likely to be at variance | Yes <i>Refer to section 3.2.2</i> |
| <p><u>Principle (c):</u> <i>“Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora.”</i></p> <p><u>Assessment:</u></p> <p>The application area is unlikely to contain or be necessary for the existence of Threatened flora. There are no records of Threatened flora in the application area or within a 40 kilometres radius of the application area (Botanica Consulting, 2021; GIS Database).</p> | Not likely to be at variance | No |
| <p><u>Principle (d):</u> <i>“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.”</i></p> <p><u>Assessment:</u></p> <p>The application area is not located within any known threatened ecological community (TEC) (Botanica Consulting, 2021; GIS Database). There are no known TECs within a 100 kilometres radius of the application area (GIS Database).</p> | Not likely to be at variance | No |
| Environmental value: significant remnant vegetation and conservation areas | | |
| <p><u>Principle (e):</u> <i>“Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.”</i></p> <p><u>Assessment:</u></p> <p>The application area is located within the Eastern Murchison subregion of the Murchison Interim Biogeographic Regionalisation of Australia (IBRA) Bioregion (Botanica Consulting, 2021; GIS Database). The Murchison Bioregion still maintains an extent of approximately 99 per cent of its pre-European vegetation (Government of Western Australia, 2019). Vegetation association 39 still maintains approximately 99 percent of its pre-European vegetation extent at both the bioregional and state level (Government of Western Australia, 2019). The application area is not part of a remnant of native vegetation in an area that has been extensively cleared.</p> | Not at variance | No |

| Assessment against the clearing principles | Variance level | Is further consideration required? |
|--|------------------------------|--|
| <p><u>Principle (h):</u> <i>“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></p> <p><u>Assessment:</u></p> <p>The closest conservation area is located approximately 64 kilometres southwest of the application area (GIS Database). Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of conservation areas.</p> | Not likely to be at variance | No |
| Environmental value: land and water resources | | |
| <p><u>Principle (f):</u> <i>“Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.”</i></p> <p><u>Assessment:</u></p> <p>There are three minor ephemeral drainage lines that intersect the northern side of the application area (GIS Database). The proposed clearing will have an impact on vegetation associated with a watercourse.</p> | At variance | Yes <i>Refer to section 3.2.3</i> |
| <p><u>Principle (g):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.”</i></p> <p><u>Assessment:</u></p> <p>Noting the location of the application area and the condition of the vegetation on the drainage tracts present, the proposed clearing may lead to land degradation in the form of water erosion.</p> | May be at variance | Yes <i>Refer to section 3.2.3</i> |
| <p><u>Principle (i):</u> <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.”</i></p> <p><u>Assessment:</u></p> <p>Given there are no permanent water courses, wetlands, or Public Drinking Water Sources Areas recorded within the application area, the proposed clearing is unlikely to impact surface or ground water quality.</p> | Not likely to be at variance | No |
| <p><u>Principle (j):</u> <i>“Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.”</i></p> <p><u>Assessment:</u></p> <p>Given there are no permanent water courses or wetlands recorded within the application area, the proposed clearing is unlikely to cause, or exacerbate, the incidence or intensity of flooding.</p> | Not likely to be at variance | No |

Appendix D. Vegetation condition rating scale

Vegetation condition is a rating given to a defined area of vegetation to categorise and rank disturbance related to human activities. The rating refers to the degree of change in the vegetation structure, density and species present in relation to undisturbed vegetation of the same type. The degree of disturbance impacts upon the vegetation's ability to regenerate. Disturbance at a site can be a cumulative effect from a number of interacting disturbance types.

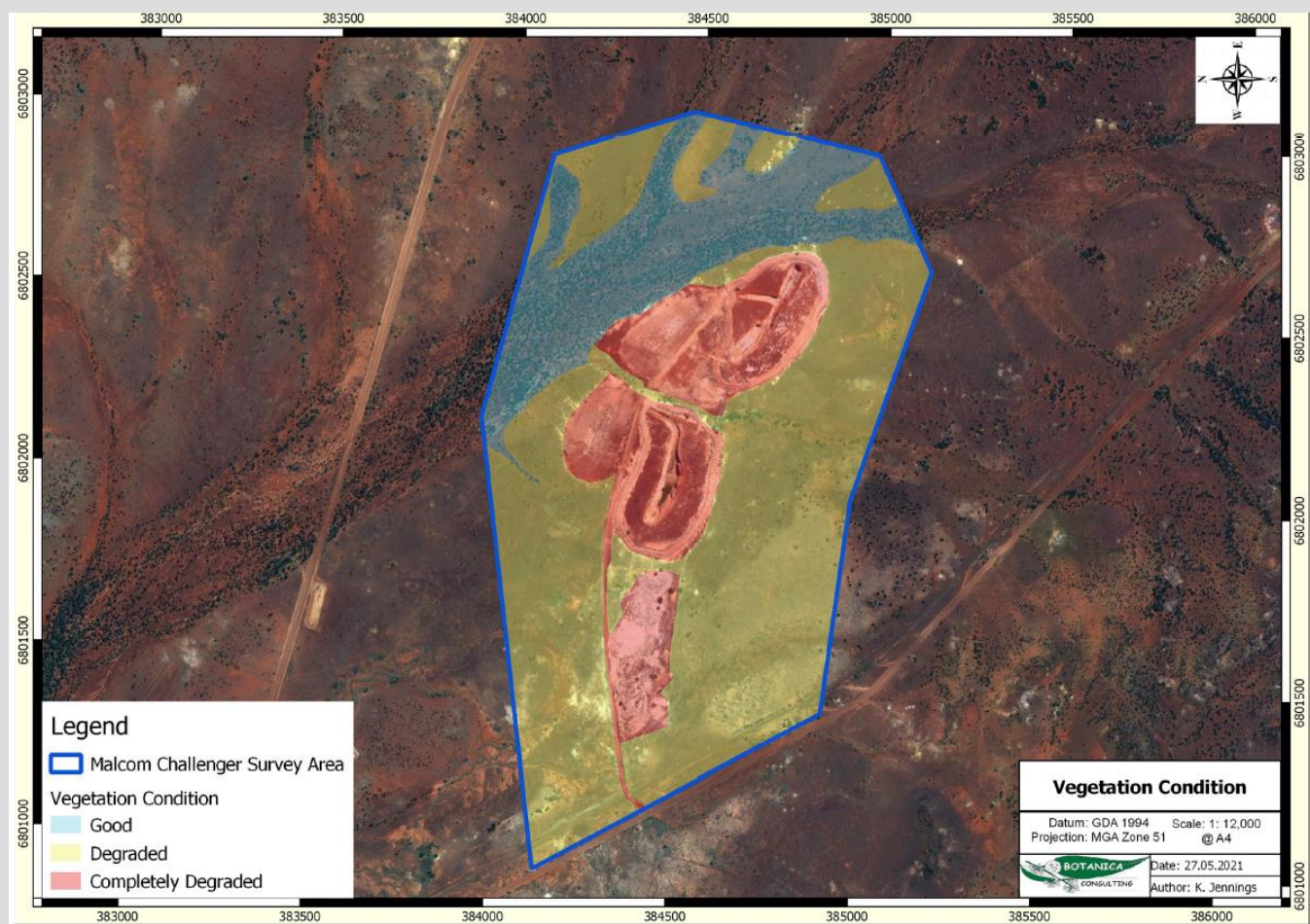
Considering its location, the scale below was used to measure the condition of the vegetation proposed to be cleared. This scale has been extracted from

Keighery, B.J. (1994) *Bushland Plant Survey: A Guide to Plant Community Survey for the Community*. Wildflower Society of WA (Inc). Nedlands, Western Australia.

Measuring vegetation condition for the South West and Interzone Botanical Province (Keighery, 1994)

| Condition | Description |
|---------------------|--|
| Pristine | Pristine or nearly so, no obvious signs of disturbance. |
| Excellent | Vegetation structure intact, with disturbance affecting individual species; weeds are non-aggressive species. |
| Very good | Vegetation structure altered, with obvious signs of disturbance. For example, disturbance to vegetation structure caused by repeated fires, the presence of some more aggressive weeds, dieback, logging and/or grazing. |
| Good | Vegetation structure significantly altered by very obvious signs of multiple disturbances. Retains basic vegetation structure or ability to regenerate it. For example, disturbance to vegetation structure caused by very frequent fires, the presence of some very aggressive weeds at high density, partial clearing, dieback and/or grazing. |
| Degraded | Basic vegetation structure severely impacted by disturbance. Scope for regeneration but not to a state approaching good condition without intensive management. For example, disturbance to vegetation structure caused by very frequent fires, the presence of very aggressive weeds, partial clearing, dieback and/or grazing. |
| Completely degraded | The structure of the vegetation is no longer intact and the area is completely or almost completely without native species. These areas are often described as 'parkland cleared' with the flora comprising weed or crop species with isolated native trees or shrubs. |

Appendix E. Biological survey information excerpts



Vegetation condition map (Botánica Consulting, 2021).

Table 4-6: Vegetation Condition within the survey area

| Condition Rating | Area (ha) | Area (%) |
|---------------------|------------|------------|
| Good | 33.3 | 18.8 |
| Degraded | 104.1 | 58.8 |
| Completely Degraded | 39.6 | 22.4 |
| Total | 177 | 100 |

Appendix F. Sources of information

F.1. GIS databases

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

- Aboriginal Heritage Places (DPLH-001)
- Clearing Regulations – Schedule One Areas (DWER-057)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Environmentally Sensitive Areas (DWER-046)
- Groundwater Salinity Statewide (DWER-026)
- Hydrographic Catchments – Catchments (DWER-028)
- Hydrography – Inland Waters – Waterlines
- Hydrography, Linear (DWER-031)
- IBRA Vegetation Statistics
- Pre-European Vegetation Statistics
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Mapping – Best Available (DPIRD-027)
- Soil Landscape Mapping – Rangelands (DPIRD-064)
- WA Now Aerial Imagery

Restricted GIS Databases used:

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

F.2. References

- Botanica Consulting (2021) Reconnaissance Flora and Basic Fauna Survey of the Malcolm Challenger Project. Report prepared for Kumarina Resources Pty Ltd, by Botanica Consulting, May 2021.
- Department of Environment Regulation (DER) (2013) *A guide to the assessment of applications to clear native vegetation*. Perth. Available from: https://www.der.wa.gov.au/images/documents/your-environment/native-vegetation/Guidelines/Guide2_assessment_native_veg.pdf
- Department of Planning, Lands and Heritage (DPLH) (2022) Aboriginal Heritage Inquiry System. Department of Planning, Lands and Heritage. <https://espatial.dplh.wa.gov.au/AHIS/index.html?viewer=AHIS> (Accessed 20 June 2022).
- Department of Primary Industries and Regional Development (DPIRD) (2021) NRInfo Digital Mapping. Department of Primary Industries and Regional Development. Government of Western Australia. URL: <https://maps.agric.wa.gov.au/nrm-info/> (Accessed 17 June 2022).
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- 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. <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics>
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- Kumarina Resources (2021) Malcolm Challenger Project application for clearing permit within Mining Lease M39/1068, M39/399 and M39/400. Kumarina Resources Pty Ltd, November 2021.

- Northcote, K. H. with Beckmann G G, Bettenay E., Churchward H. M., van Dijk D. C., Dimmock G. M., Hubble G. D., Isbell R. F., McArthur W. M., Murtha G. G., Nicolls K. D., Paton T. R., Thompson C. H., Webb A. A. and Wright M. J. (1960-68) Atlas of Australian Soils, Sheets 1 to 10, with explanatory data. CSIRO and Melbourne University Press: Melbourne.
- 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.
- Western Australian Herbarium (1998-) FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions, Western Australia. <https://florabase.dpaw.wa.gov.au/> (Accessed 17 June 2022).

4. Glossary

Acronyms:

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|-----------------|---|
| 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).

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.