GOVERNMENT OF
WESTERN AUSTRALIA

CLEARING PERMIT

Granted under section 51E of the Environmental Protection Act 1986

Purpose Permit number:	CPS 9438/1
Permit Holder:	Fortescue Metals Group
Duration of Permit:	From 22 April 2022 to 22 April 2027

The permit holder is authorised to clear *native vegetation* subject to the following conditions of this permit.

PART I – CLEARING AUTHORISED

1. Clearing authorised (purpose)

The permit holder is authorised to clear *native vegetation* for the purpose of constructing an autonomous vehicle test track.

2. Land on which clearing is to be done

Lot 145 on Deposited Plan 4553, Hazelmere

3. Clearing authorised

The permit holder must not clear more than 0.1681 hectares of *native vegetation* within the area cross-hatched yellow in Figure 1 of Schedule 1.

PART II – MANAGEMENT CONDITIONS

4. Avoid, minimise, and reduce impacts and extent of clearing

In determining the *native vegetation* authorised to be cleared under this permit, the permit holder must apply the following principles, set out in descending order of preference:

(a) avoid the clearing of *native vegetation*;

(b) minimise the amount of *native vegetation* to be cleared; and

(c) reduce the impact of clearing on any environmental value.

5. Weed and dieback management

When undertaking any clearing authorised under this permit, the permit holder must take the following measures to minimise the risk of introduction and spread of *weeds* and *dieback*:

(a) clean earth-moving machinery of soil and vegetation prior to entering and leaving the area to be cleared;

(b) ensure that no known *dieback* or *weed*-affected soil, *mulch*, *fill*, or other material is brought into the area to be cleared; and

(c) restrict the movement of machines and other vehicles to the limits of the areas to be cleared.

PART III - RECORD KEEPING AND REPORTING

6. Records that must be kept

The permit holder must maintain records relating to the listed relevant matters in accordance with the specifications detailed in Table 1.

Table 1: Records that must be kept

No.	Relevant matter	Specifications
1.	In relation to the authorised clearing activities generally	(a) the species composition, structure, and density of the cleared area; (b) the location where the clearing occurred, recorded using a Global Positioning System (GPS) unit set to Geocentric Datum Australia 1994 (GDA94), expressing the geographical coordinates in Eastings and Northings; (c) the date that the area was cleared; (d) the size of the area cleared (in hectares); (e) actions taken to avoid, minimise, and reduce the impacts and extent of clearing in accordance with condition 4; and (f) actions taken to minimise the risk of the introduction and spread of *weeds* and *dieback* in accordance with condition 5

7. Reporting

The permit holder must provide to the *CEO* the records required under condition 6 of this permit when requested by the *CEO*.

DEFINITIONS

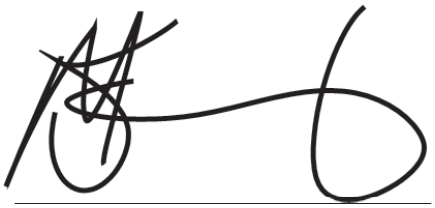
In this permit, the terms in Table have the meanings defined.

Table 2: Definitions

Term	Definition
CEO	Chief Executive Officer of the department responsible for the administration of the clearing provisions under the *Environmental Protection Act 1986*.
clearing	has the meaning given under section 3(1) of the EP Act.

Term	Definition
condition	a condition to which this clearing permit is subject under section 51H of the EP Act.
dieback	means the effect of *Phytophthora* species on native vegetation.
department	means the department established under section 35 of the *Public Sector Management Act 1994* (WA) and designated as responsible for the administration of the EP Act, which includes Part V Division 3.
EP Act	*Environmental Protection Act 1986* (WA)
mulch	means the use of organic matter, wood chips or rocks to slow the movement of water across the soil surface and to reduce evaporation.
native vegetation	has the meaning given under section 3(1) and section 51A of the EP Act.
weeds	means any plant – (a) that is a declared pest under section 22 of the *Biosecurity and Agriculture Management Act 2007*; or (b) published in a Department of Biodiversity, Conservation and Attractions species-led ecological impact and invasiveness ranking summary, regardless of ranking; or (c) not indigenous to the area concerned.

END OF CONDITIONS



Mathew Gannaway
MANAGER
NATIVE VEGETATION REGULATION

Officer delegated under Section 20
of the Environmental Protection Act 1986

29 March 2022

Schedule 1

CPS 9438/1

The boundary of the area authorised to be cleared is shown in the map below (Figure 1).

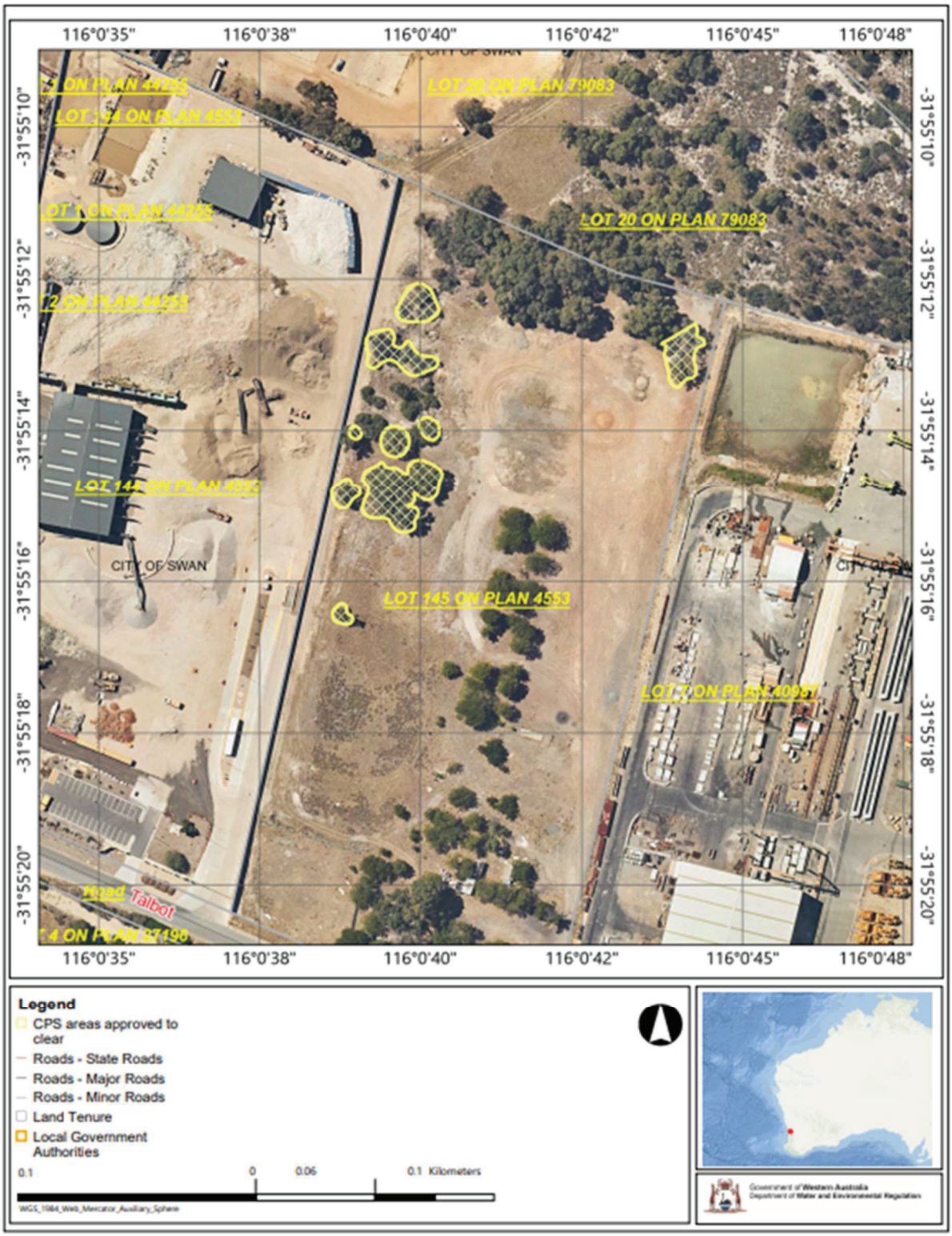


Figure 1: Map of the boundary of the area within which clearing may occur

Government of Western Australia
Department of Water and Environmental Regulation

Clearing Permit Decision Report

1 Application details and outcome

1.1. Permit application details

Permit number:	CPS 9438/1
Permit type:	Purpose permit
Applicant name:	Fortescue Metals Group
Application received:	23 September 2021
Application area:	0.1681 hectares of native vegetation
Purpose of clearing:	Autonomous vehicle test track
Method of clearing:	Mechanical
Property:	Lot 145 on Deposited Plan 4553
Location (LGA area/s):	City of Swan
Localities (suburb/s):	Hazelmere

1.2. Description of clearing activities

The application is to clear 0.1681 hectares of native trees and shrubs on a freehold Lot for the purpose of building a test track for Artificial Intelligence (AI) systems to remotely guide vehicles (FMG, 2021).

The area proposed to be cleared is contained mostly to a 100-metre strip of native vegetation on the western side of the Lot with one other small area located to the northeast corner of the property (see Figure 1, Section 1.5).

1.3. Decision on application

Decision:	Granted
Decision date:	29 March 2022
Decision area:	0.1681 hectares of native vegetation, as depicted in Section 1.5, below.

1.4. Reasons for decision

This clearing permit application was submitted, accepted, assessed and determined in accordance with sections 51E and 51O of the *Environmental Protection Act 1986* (EP Act). The Department of Water and Environmental Regulation (DWER) advertised the application for 21 days and no submissions were received.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix B), relevant datasets (see Appendix F.1), the supporting documents (see Appendix E), the clearing principles set out in Schedule 5 of the EP Act (see Appendix C), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3.3).

- The assessment identified that the proposed clearing will result in the potential introduction and spread of weeds and dieback into adjacent vegetation, which could impact on the quality of the adjacent vegetation and its habitat values.

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 is unlikely to lead to appreciable land degradation and can be minimised and managed to unlikely 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 and dieback.

1.5. Site map

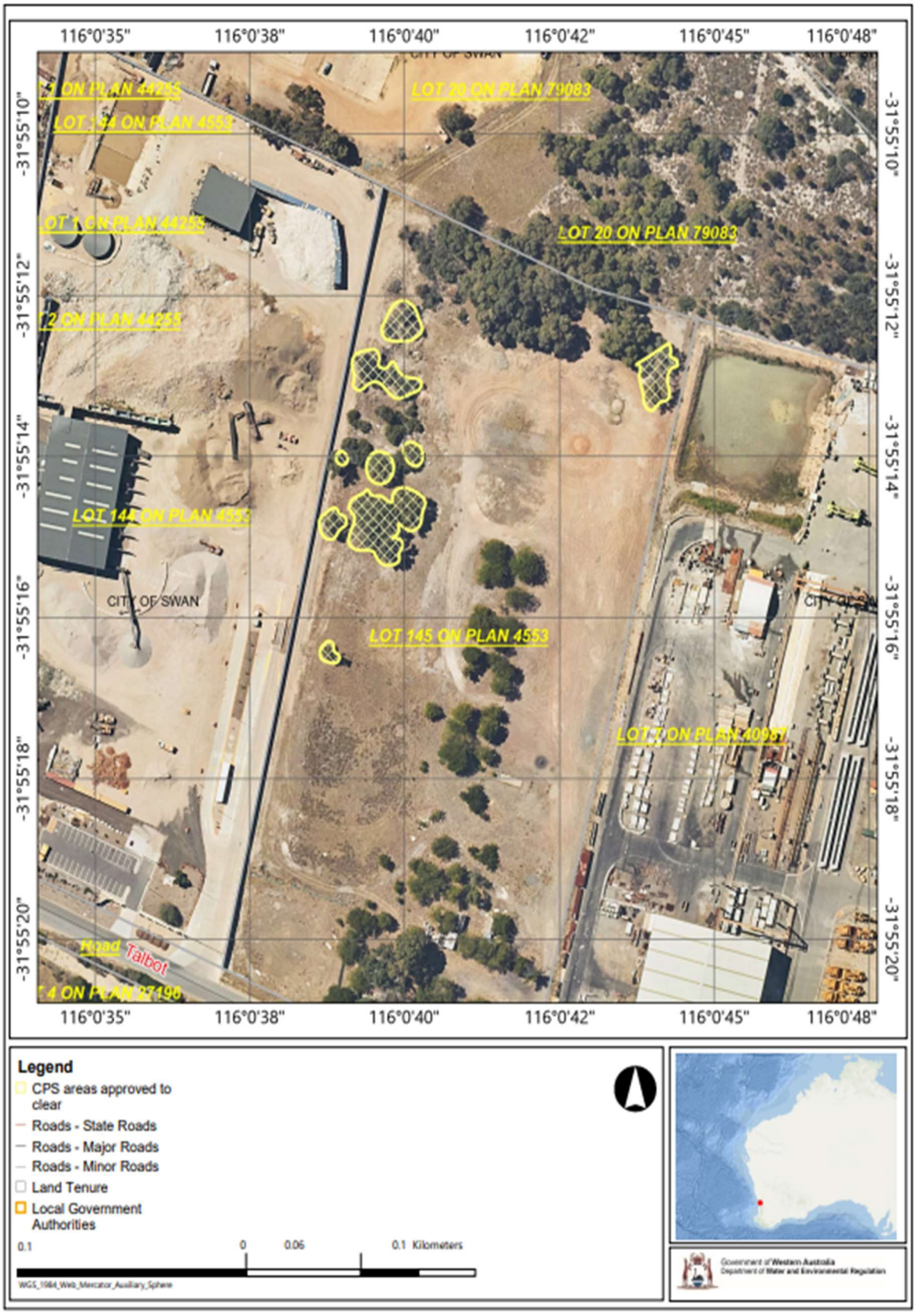


Figure 1: Map of the application area

The area crosshatched yellow indicates the area authorised to be cleared under the granted clearing permit.

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 include:

- *Biodiversity Conservation Act 2016* (WA) (BC Act)
- *Conservation and Land Management Act 1984* (WA) (CALM Act)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)
- *Planning and Development Act 2005* (WA) (P&D Act)

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 2019)
- Technical guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* (EPA, 2016)

3 Detailed assessment of application

3.1. Avoidance and mitigation measures

Evidence was submitted by the applicant, demonstrating that avoidance and minimisation of clearing native vegetation was considered. Fortescue Metals Group stated that trees would be retained were possible and the Bush Forever area will be avoided (FMG, 2021). Some sections of the initial application area occurred within or in proximity of a mapped threatened ecological community. The applicant agreed to avoid these areas and were removed from the application footprint during the assessment process.

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.

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 (see Appendix C) identified the impacts of the proposed clearing are limited and able to be managed with standard avoid and minimise and hygiene management conditions.

3.2.1. Biological values (fauna) - Clearing Principles (a and b)

Assessment

Vegetation over the application area consist of three different native vegetation types as listed below and represented in Appendix E (PGV Environmental, 2021).

- Et - *Eucalyptus todtiana* (blackbutt) low woodland over weeds
- AfBs - *Allocasuarina fraseriana* (sheoak) / *Banksia sessilis* (parrot bush) tall shrubland over weeds
- Em - *Eucalyptus marginata* (jarrah) over weeds

Condition of the native vegetation over the proposed clearing area is described as completely degraded (Keighery, 1994) due to the absence of native understorey layer, weed invasion, historical clearing and high level of additional disturbances within the surrounding area (PGV Environmental, 2021). Noting the above, the application area will not provide suitable habitat for the existence of conservation significant flora species identified within the ten-kilometre radius local buffer.

Fauna

The desktop assessment of the application area identified 51 conservation significant fauna species within the ten-kilometre radius buffer of the application area which include 23 bird species, one fish species, five invertebrate species, eight mammal species and four reptile species.

Class: Birds

Majority of the birds identified through the desktop study are migratory birds associated with mudflats, freshwater wetlands, saltmarshes, mangroves and riparian vegetation and does not breed in Western Australia (DAWE, 2021). Based on the known distribution and habitat preference, the bird species most likely to occur over the application area are the three vagile species of black cockatoos; the endangered *Calyptorhynchus latirostris* (Carnaby's black cockatoo), vulnerable *Calyptorhynchus banksii naso* (Forest red-tailed black cockatoo) and endangered *Calyptorhynchus baudinii* (Baudin's cockatoo). Majority of the black cockatoos were identified as Carnaby's cockatoos within the ten-kilometre radius local buffer (see Appendix B.3). The application area is mapped over the distribution zone of all three black cockatoo species.

Carnaby's cockatoos were once very numerous in the southwest of Western Australia, however, has suffered at least a 50 per cent decline in the total population and has disappeared from more than a third of its breeding range between 1968 and 1990 (DPaW, 2013). It is now listed as endangered under both the federal EPBC Act and state BC Act. The decline of Carnaby's cockatoo has been due primarily to the loss and fragmentation of habitat, as a result of clearing of native vegetation, since the middle of the 20th century (DPaW, 2013). Identified breeding and nearby feeding habitat, former breeding habitat that has hollows intact and vegetation that provides habitat for feeding, watering and regular night roosting is considered habitat critical for recovery of the species (DPaW, 2013).

Breeding Habitat

Black cockatoo preferred breeding habitat includes:

- live or dead trees of *Corymbia calophylla* (marri), jarrah, *Eucalyptus diversicolor* (karri), *Eucalyptus wandoo* (wandoo), tuart, *Eucalyptus rudis* (flooded gum), and other eucalyptus spp. that either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow, which is 500 millimetres for most tree species (Commonwealth of Australia, 2012).
- together with feeding areas and watering sites within foraging distance (12 kilometres) of breeding sites (DPaW, 2013).

The application area was inspected by PGV Environmental on the 16 August 2021 and determined that the trees proposed to be cleared do not provide breeding value to the black cockatoos (PGV Environmental, 2021). No large trees with hollows is present within the application area.

Foraging Habitat

The Forest Red-tailed black cockatoo feeds mainly on the seeds of marri (*Corymbia calophylla*) and jarrah (*Eucalyptus marginata*); other foods include sheoak (*Allocasuarina fraseriana*), snottygobble (*Persoonia longifolia*), blackbutt (*Eucalyptus patens*) and introduced species including white cedar (*Cape Lilac*) (*Melia azedarach*) and lemon-scented gum (*Corymbia citriodora*) (Johnstone and Kirkby, 2008).

Carnaby's cockatoo forages on the seeds, nuts and flowers of a variety of plants, including Proteaceous species (banksia, hakea and grevillea), as well as allocasuarina and eucalyptus species, marri and a range of introduced species (Valentine and Stock, 2008). Carnaby's cockatoos generally forages within six (and up to 12 kilometres) of its nesting or night roost site (Commonwealth of Australia, 2012).

Baudin's cockatoos are also known to feed on a range of foods including the seeds of sheoak. However, marri is the primary food source with the birds using its seeds, flowers, nectar and buds (R.E. & C.Johnstone and Kirkby, 2010).

There are 18 known black cockatoo roost sites within a six-kilometre radius buffer from the application area. The vegetation proposed to be cleared includes the three black cockatoos foraging species (*Eucalyptus marginata, Eucalyptus todtiana*, *Allocasuarina fraseriana* and *Banksia sessilis)* within the foraging distance to numerous roost sites. However, the area proposed to be cleared is very small and quality of the foraging habitat is low (PGV Environmental, 2021) in relation to that within the surrounding Beelu National Park, Greenmount National Park, John Forest National Park and the Bush Forever sites within the local area. The higher quality forgaing *Corymbia calophylla* trees will be retained within Lot 145. Noting the above and the application area being a small clearing footprint with individual native trees located in between a highly active industrial area, the possibility of black cockatoos utilising the native vegetation within the application area is minimal. The proposed clearing is unlikely to represent a significant loss of black cockatoo foraging habitat.

Roosting Habitat

There are 56 confirmed roost sites in the local area in which 18 roost sites fall within the six-kilometre radius buffer area. Noting the small extent of the application area and the availability of habitat in better condition in the local area, the application area is unlikely to provide significant roosting habitat for black cockatoos.

Class: Invertebrates, Mammals, Fish and Reptiles

The completely degraded (Keighery, 1994) nature of the native vegetation, and in particular the lack of an understorey, combined with the isolation of the application area from areas of native vegetation in good or better condition (Keighery, 1994) (PGV Environmental, 2021), the absence of watercourse and being located within an industrial area excludes the likelihood of invertebrates, mammals, fish and reptile species known to occur within the ten-kilometre radius local area occurring over the application area.

The proposed clearing may depreciate the condition of the remnant vegetation within the Bush Forever site located north of the application area due to the increased risk of spread of weed and dieback. Implementation of weed and dieback management strategies will mitigate the risk.

Conclusion

Given the size of the clearing and the completely degraded (Keighery, 1994) condition of the vegetation in relation to its position in the landscape, and the location of known roost sites and mapped foraging habitats, it is unlikely that the native vegetation within the application area represent an important foraging resource to support black cockatoo populations. For the reason set out above, it is considered that the impacts of the proposed clearing on fauna habitat does not constitute a significant residual impact.

It is considered appropriate that hygiene measures should be implemented during clearing to help protect remnant vegetation from weed and dieback spread and the resultant degradation in habitat that can occur.

Conditions:

- The permit holder is required to take hygiene steps to minimise the risk of the introduction and spread of weeds and dieback.

3.3. Relevant planning instruments and other matters

Other relevant authorisations required for the proposed land use include Development approval under the *Planning and Development Act 2005* (issued by the City of Swan). The City of Swan advised DWER that the proposed clearing is consistent with the City's Local Planning Scheme. The City did not have any objections to the proposed clearing (City of Swan, 2021). Fortescue Metals Group was issued with Development Approval to use the land for Autonomous vehicle testing including associated development within Lot 145 Talbot Road, Hazelmere, on the 08 March 2022 by the City of Swan.

No Aboriginal sites of significance have been mapped within the application area. It is the permit holder's responsibility to comply with the *Aboriginal Heritage Act 1972* (WA) and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

End

Appendix A. Additional information provided by applicant

Information	Description
Clearing Permit Application Supporting Document (PGV Environmental, 2021)	Applicant has provided DWER with background information on the proposal and the proposed vegetation to be cleared. Applicant has further included an assessment of the ten clearing principals outlined in the *Environmental Protection Act 1986*.

Appendix B. Site characteristics

B.1. Site characteristics

The information provided below describes the key characteristics of the area proposed to be cleared and is based on the best information available to DWER at the time of the assessment. This information was used to inform the assessment of the clearing against the Clearing Principles, contained in Appendix C.

Characteristic	Details
Local context	The area proposed to be cleared is part of an expansive tract of native vegetation in the intensive land use zone of Western Australia. It is surrounded by the Hazelmere industrial area and remnant bushland. The proposed clearing area is part of a large 15-hectare area of vegetation. Spatial data indicates the local area (10-kilometre radius from the centre of the area proposed to be cleared) retains approximately 23.9 per cent of the original native vegetation cover.
Ecological linkage	No ecological linkages are mapped or considered to exist within the application area. The application area does not provide a linkage between the surrounding remnant vegetation.
Conservation areas	There are several conservation areas within the local area, the closest being Bush Forever Site 481 which is approximately 0.01 kilometres north of the application area. Other larger conservation areas within the local area include (DBCA-012, BDCA-011): • Beelu National Park – ~3.5 km east of the application area • John Forest National Park – ~5 km northeast of the application area • Greenmount National Park - ~4.1 km east of the application area
Vegetation description	Supporting document provided by the applicant (PGV Environmental, 2021) indicate the vegetation within the proposed clearing area consists mostly of cleared paddock trees with weed species. Three native vegetation types were identified over the application area described as, Et – *Eucalyptus todtiana* (blackbutt) low woodland over weeds, AfBs – *Allocasuarina fraseriana* (Sheoak)/ *Banksia sessilis* (Parrot bush) tall shrubland over weeds and Em – *Eucalyptus marginata* (Jarrah) over weeds (PGV Environmental, 2021). The full survey descriptions and maps are available in Appendix E. This is consistent with the mapped vegetation type(s): • Heddle 42, which is described as open woodland of *Corymbia calophylla* (marri) - *Eucalyptus marginata* (jarrah) - Banksia species with fringing woodland of *Eucalyptus rudis* (flooded Gum) - *Melaleuca rhaphiophylla* (swamp paperbark) along creek beds (Heddle, 1980). • Beard Vegetation Association 1001, which is described as low forest, woodland or low woodland with scattered trees (Shepherd, 2001) The mapped vegetation types retain over ten per cent of the original native vegetation extent (Government of Western Australia, 2019).

Characteristic	Details
Vegetation condition	Vegetation assessment (PGV Environmental) indicate the vegetation within the proposed clearing area is in a completely degraded (Keighery, 1994) condition. The full Keighery (1994) condition rating scale is provided in Appendix D. The full survey descriptions and mapping are available in Appendix E.
Climate and landform	The application area receives an average rainfall of 800 millimetres (mm) annually and has an average evapotranspiration of 800 mm. The application area is within the Pinjarra system described as Swan Coastal Plain from Perth to Capel. Poorly drained coastal plain with variable alluvial and aeolian soils (DPIRD, 2019).
Soil description	The soil is mapped as 213Pj described as minor rises with deep rapidly drained brownish, siliceous or bleached sands underlain by mottled yellow clay (DPIRD, 2019).
Land degradation risk	The soils in which the application area falls into have a: • high risk of wind erosion, phosphorus export and waterlogging. • low risk of water erosion and salinity. The land degradation table B.3 below further summarises the soil degradation risk within the application area.
Waterbodies	The application area is within the Coastal Plain hydrological zone and within the Swan Avon-Lower Swan hydrographic catchment (DPIRD-069). The desktop assessment and aerial imagery indicated that the northern section of the application area is within ten metres of a mapped geomorphic wetland of the swan coastal plain named Helena River Floodplain/ Swan Street. No significant watercourses or wetlands are mapped over the area proposed to be cleared (DBCA-045).
Hydrogeography	The area proposed to be cleared is within the Perth groundwater area and the Swan River system surface water area proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act) (DWER-034, DWER-037). The application area does not occur within a Public Drinking Water Area (DWER-034) or an area subject to the *Country Areas Water Supply Act 1947*. Groundwater salinity level (Total Dissolved Solids) is mapped as 500-1000 millimetres per litre (fresh water) (DWER-026).
Flora	76 species of conservation significant flora have been recorded in the local area (ten-kilometres). There are records of three priority flora and one record of threatened flora within one kilometre, all of which are found on the same soil type as the application area.
Ecological communities	No Threatened Ecological Community (TEC) or Priority Ecological Community (PEC) are mapped over the application area. The nearest record occurs within ten metres of the northern section of the application area, 'Shrublands and woodlands of the eastern side of the Swan Coastal Plain (floristic community type 20c originally described in Gibson et al. (1994)' considered critically endangered under the EP Act. Banksia woodlands of the Swan Coastal plain are also mapped approximately 13 metres north of the application area, considered a Priority 3 ecological community by DBCA.
Fauna	There are records of 50 species of threatened fauna within the local area (ten kilometres). The nearest record is for *Calyptorhynchus latirostris* (Carnaby's cockatoo) approximately 0.46 kilometres from the application area. The local area includes 217 unspecified records for white-tailed black cockatoo, the nearest at 1.14 kilometres from the application area. Black cockatoo habitat within the local area includes: • 56 known black cockatoo roost sites. The nearest is 1.72 kilometres east of the application area.

Characteristic	Details
	• 13 White tailed black cockatoo breeding sites. The nearest of which is 5.85 kilometres east of the application area. • Black cockatoo feeding sites in the local area including the vegetation adjacent to the application area.

B.2. Vegetation extent

	Pre-European extent (ha)	Current extent (ha)	Extent remaining (%)	Current extent in all DBCA managed land (ha)	Current proportion (%) of pre-European extent in all DBCA managed land
IBRA bioregion*					
Swan Coastal Plain	1,501,209.19	587,889.09	39.16	195,834.87	13.04
Vegetation Association					
Beard vegetation Association (1001)*	57,410.23	12,660.76	22.05	1,796.27	3.13
Vegetation Complex **					
Southern River Complex (42)**	58,781.48	10,832.18	18.43	940.36	1.6
Local area					
10km radius	31,438.43	7,958	25.31	-	-

*Government of Western Australia (2019a)

**Government of Western Australia (2019b)

B.3. Fauna analysis table

The following table list the conservation significant fauna species recorded within the ten-kilometre radius local area which does not fall into the migratory bird category and is not a marine species. Records which are historical are also not included within the fauna analysis table.

Species name	Conservation status	Conservation status	Number of known records (total)	Year of most recent record	Distance of closest record to application area (km)	Suitable habitat features? [Y/N]	Are surveys adequate to identify? [Y, N, N/A]
BIRD							
Anous tenuirostris melanops	Australian lesser noddy	EN	2	1955	4.72	N	N
Botaurus poiciloptilus	Australasian bittern	EN	6	1979	4.89	N	N
Cacatua pastinator pastinator	Muir's corella	CD	6	-	3.42	N	N
Calidris canutus	Red knot	EN	1	1978	8.78	N	N
Calidris ferruginea	curlew sandpiper	CR	12	2001	8.78	N	N
Calidris tenuirostris	Great knot	CR	1	1978	8.78	N	N
Calyptorhynchus banksii naso	forest red-tailed black cockatoo	VU	58	2018	1.00	Y (foraging)	N

Species name	Conservation status	Conservation status	Number of known records (total)	Year of most recent record	Distance of closest record to application area (km)	Suitable habitat features? [Y/N]	Are surveys adequate to identify? [Y, N, N/A]
Calyptorhynchus baudinii	Baudin's cockatoo	EN	100	2018	1.39	Y (foraging)	N
Calyptorhynchus latirostris	Carnaby's cockatoo	EN	1551	2018	0.46	Y (foraging)	N
Calyptorhynchus sp. 'white-tailed black cockatoo'	White-tailed black cockatoo	EN	217	2019	1.15	Y (foraging)	N
Elanus scriptus	Letter-winged kite	P4	1	1980	8.78	N	N
Falco peregrinus	Peregrine falcon	OS	45	2011	3.84	N – May overfly	N
Ixobrychus flavicollis australis (southwest subpop.)	black bittern (southwest subpop.)	P2	2	1934	4.68	N	N
Oxyura australis	Blue-billed duck	P4	123	2013	1.68	N	N
Sternula nereis nereis	Fairy tern	VU	1	1961	8.90	N	N
INVERTEBRATE							
Synemon gratiosa	graceful sunmoth	P4	3	2019	5.90	N	N
MAMMAL							
Dasyurus geoffroii	Chuditch, western quoll	VU	44	2017	0.73	N	N
Falsistrellus mackenziei	Western false pipistrelle, western falsistrelle	P4	1	1973	9.64	N	N
Isoodon fusciventer	Quenda, southwestern brown bandicoot	P4	817	2020	0.77	N	N
Myrmecobius fasciatus	numbat, walpurti	EN	1	1974	8.79	N	N
Notamacropus irma	Western brush wallaby	P4	4	1985	8.27	N	N
Phascogale tapoatafa wambenger	South-western brush-tailed phascogale, wambenger	CD	18	2018	5.16	N	N
Pseudocheirus occidentalis	western ringtail possum, ngwayir	CR	1	1958	3.37	N	N
REPTILE							
Ctenotus delli	Dell's skink, Darling Range Southwest Ctenotus	P4	2	1985	3.84	N	N
Ctenotus ora	Coastal Plains skink	P3	6	1965	9.44	N	N
Neelaps calonotos	Black-striped snake, black-striped burrowing snake	P3	25	1975	6.18	N	N

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority

B.4. Land degradation risk table

Risk categories	Risk	Description
Wind erosion	H2	>70% of map unit has a high to extreme wind erosion risk
Water erosion	L1	<3% of map unit has a high to extreme water erosion risk
Salinity	L1	<3% of map unit has a moderate to high salinity risk or is presently saline

Subsurface Acidification	H2	>70% of map unit has a high to extreme phosphorus export risk
Flood risk	L1	<3% of the map unit has a moderate to high flood risk
Water logging	H2	10-30% of map unit has a moderate to very high waterlogging risk
Phosphorus export risk	H2	>70% of map unit has a high to extreme phosphorus export risk

Appendix C. Assessment against the clearing principles

Assessment against the clearing principles	Variance level	Is further consideration required?
Environmental value: biological values		
Principle (a): *"Native vegetation should not be cleared if it comprises a high level of biodiversity."* Assessment: The supporting information provided by the applicant indicate large portions of the Lot on which the application area is located is mostly cleared paddock with weed species. The application area is limited to some of the remaining native trees including *Eucalyptus todtiana*, *Allocasuarina fraseriana*, *Banksia sessilis* and *Eucalyptus marginata.* The vegetation is in a completely degraded (Keighery, 1994) condition as the understorey is dominated by weeds and there is a high level of disturbance (PGV Environmental, 2021). The application area does not comprise of high level of biodiversity.	Not likely to be at variance	Yes *Refer to Section 3.2.1, above.*
Principle (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."* Assessment: The area proposed to be cleared contains potential foraging habitat for black cockatoos. However, considering the condition and location of the native vegetation trees proposed to be cleared, it is unlikely the application area represents important foraging habitat for black cockatoos. Based on the habitat preference of fauna identified within the local area, it is unlikely the application area represent important habitat for these fauna species.	Not likely to be at variance	Yes *Refer to Section 3.2.1, above.*
Principle (c): *"Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, threatened flora."* Assessment: The area proposed to be cleared is unlikely to contain threatened flora species listed under the BC Act or EPBC Act.	Not likely to be at variance	No
Principle (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."* Assessment: A critically endangered TEC, 'Shrublands and woodlands of the eastern side of the Swan Coastal Plain (floristic community type 20c as originally described in Gibson et al. (1994)) is mapped within ten metres of the application area. The vegetation present in the application area does not contain any native understorey species and lacks the diversity to represent this floristic community as it has been completely degraded (Keighery, 1994) and only represents isolated shrubs and trees. The clearing is limited to *Eucalyptus marginata*, *Allocasuarina fraseriana*, *Eucalyptus todtiana* and *Banksia sessilis* individuals. The application area is not mapped within a TEC.	Not likely to be at variance	No
Environmental value: significant remnant vegetation and conservation areas		

Assessment against the clearing principles	Variance level	Is further consideration required?
Principle (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."* Assessment: The Swan Coastal Plain IBRA region within which the application area is located retains 39 per cent of its original extent. The remnant vegetation in the local area (ten kilometres) is 25.3 per cent of original extent. The mapped southern river complex (42) vegetation type retains approximately 18.4 per cent of the original extent and the beard vegetation association (1001) retains approximately 22 per cent of the original extent (Government of Western Australia, 2019). The Environmental Protection Authority recognises the Perth metropolitan area as a constrained area, which the minimum ten per cent representation threshold for ecological communities is recommended (EPA, 2008). The extent of the mapped vegetation type remaining is consistent with the EPA (2008) targets for a constrained area. The application area is not considered to represent a significant remnant of native vegetation or provide ecological linkage values in the local area.	Not likely to be at variance	No
Principle (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."* Assessment: Bush Forever site (481) occurs within 30 metres of the application area. Considering the existing completely degraded (Keighery, 1994) condition of the native vegetation within Lot 145, the clearing is unlikely to have a significant impact on the environmental values of the adjacent conservation area.	Not likely to be at variance	No
Environmental value: land and water resources		
Principle (f): *"Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland."* Assessment: The application area is within ten metres of a mapped multiple use wetland named the Helena River Floodplain/Swan Street. The trees proposed to be cleared are not representative of vegetation typically associated with a wetland. The proposed clearing is unlikely to impact on or off-site hydrology and water quality considering the limited extent of the application area and the already completely degraded (Keighery, 1994) area within the Lot on which the clearing is to take place.	Not likely to be at variance	No
Principle (g): *"Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation."* Assessment: The mapped soils are susceptible to wind erosion and nutrient export (DPIRD, 2019). Noting the small extent, the already completely degraded (Keighery, 1994) condition of the vegetation and the intended purpose to establish a test track for autonomous vehicles, the proposed clearing is not likely to have an appreciable impact on land degradation.	Not likely to be at variance	No
Principle (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."* Assessment: Given the small extent and completely degraded (Keighery, 1994), condition of the application area, it is unlikely the proposed clearing will result in significant impacts to surface or ground water quality.	Not likely to be at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
Principle (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."* Assessment: The mapped soils within the application area have a low risk of flooding. Stormwater will be controlled by the stormwater management system as detailed in the Development Application. The proposed clearing is unlikely to influence the incidence or intensity of flooding.	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. Supporting information excerpts & photographs of the vegetation (PGV Environmental, 2021)

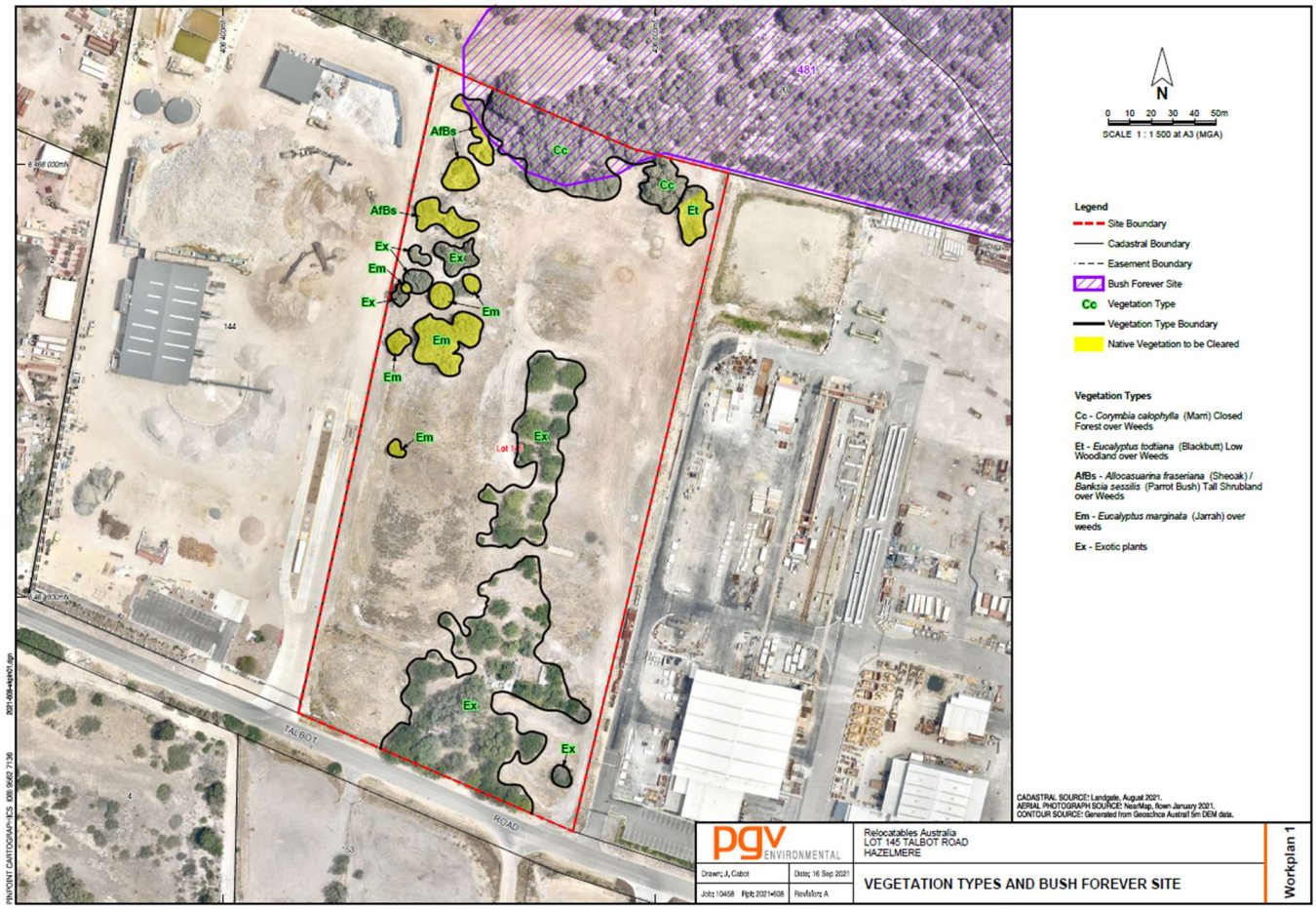


Figure 2: Vegetation mapping within Lot 145 Talbot Road, Hazelmere

Plate 3: Cleared Paddock with Weeds

There are five vegetation types on the site is described as:

Cc - *Corymbia calophylla* (Marri) Closed Forest over Weeds
Et - *Eucalyptus todtiana* (Blackbutt) Low Woodland over Weeds
AfBs - *Allocasuarina fraseriana* (Sheoak) / *Banksia sessilis* (Parrot Bush) Tall Shrubland over Weeds
Em - *Eucalyptus marginata* (Jarrah) over weeds
Ex - Exotic plants

The *Corymbia calophylla* (Marri) Closed Forest over Weeds (Cc) will be retained on the site and most of the additional vegetation types will be cleared. All of the vegetation is rated as Completely Degraded as there is no intact understorey and there is a high level of disturbance (Plate 4).

Plate 4: Completely Degraded Vegetation on the site

Appendix F. Sources of information

F.1. GIS databases

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

- 10 Metre Contours (DPIRD-073)
- Aboriginal Heritage Places (DPLH-001)
- Aboriginal Heritage Places (DPLH-001)
- Cadastre (LGATE-218)
- Cadastre Address (LGATE-002)
- Contours (DPIRD-073)
- DBCA – Lands of Interest (DBCA-012)
- DBCA Legislated Lands and Waters (DBCA-011)
- Directory of Important Wetlands in Australia – Western Australia (DBCA-045)
- Environmentally Sensitive Areas (DWER-046)
- Flood Risk (DPIRD-007)
- Groundwater Salinity Statewide (DWER-026)
- Hydrography – Inland Waters – Waterlines
- Hydrological Zones of Western Australia (DPIRD-069)
- IBRA Vegetation Statistics
- Imagery
- Local Planning Scheme – Zones and Reserves (DPLH-071)
- Native Title (ILUA) (LGATE-067)
- Offsets Register – Offsets (DWER-078)
- Pre-European Vegetation Statistics
- Public Drinking Water Source Areas (DWER-033)
- Ramsar Sites (DBCA-010)
- Regional Parks (DBCA-026)
- Remnant Vegetation, All Areas
- RIWI Act, Groundwater Areas (DWER-034)
- RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037)
- Soil Landscape Land Quality – Flood Risk (DPIRD-007)
- Soil Landscape Land Quality – Phosphorus Export Risk (DPIRD-010)
- Soil Landscape Land Quality – Subsurface Acidification Risk (DPIRD-011)
- Soil Landscape Land Quality – Water Erosion Risk (DPIRD-013)
- Soil Landscape Land Quality – Water Repellence Risk (DPIRD-014)
- Soil Landscape Land Quality – Waterlogging Risk (DPIRD-015)
- Soil Landscape Land Quality – Wind Erosion Risk (DPIRD-016)
- Soil Landscape Mapping – Best Available
- Soil Landscape Mapping – Systems
- Wheatbelt Wetlands Stage 1 (DBCA-021)

Restricted GIS Databases used:

- ICMS (Incident Complaints Management System) – Points and Polygons
- 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

Commonwealth of Australia (2001) *National Objectives and Targets for Biodiversity Conservation 2001-2005*, Canberra.

Department of Agriculture, Water and the Environment (DAWE) (n.d). Species Profile and Threats Database (SPRAT). Government of Western Australia. URL: https://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl (accessed 30 November 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 Parks and Wildlife (2013) Carnaby's cockatoo (Calyptorhynchus latirostris) Recovery Plan. Department of Parks and Wildlife, Perth, Western Australia.

Department of Primary Industries and Regional Development (DPIRD) (2019). *NRInfo Digital Mapping. Department of Primary Industries and Regional Development.* Government of Western Australia. URL: https://maps.agric.wa.gov.au/nrm-info/ (accessed 30 November 2021).

Department of Sustainability, Environment, Water Population and Communities (DSEWPaC). 2012. EPBC Act Referral Guidelines for Three Threatened Black Cockatoo Species. Commonwealth of Australia

Department of Water and Environmental Regulation (DWER) (2019). *Procedure: Native vegetation clearing permits*. Joondalup. Available from: https://dwer.wa.gov.au/sites/default/files/Procedure_Native_vegetation_clearing_permits_v1.PDF.

Environmental Protection Authority (EPA) (2008) Environmental Guidance for Planning and Development Guidance Statement No 33. Environmental Protection Authority, Western Australia.

Environmental Protection Authority (EPA) (2016). *Technical Guidance - Flora and Vegetation Surveys for Environmental Impact Assessment*. Available from: http://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/EPA%20Technical%20Guidance%20-%20Flora%20and%20Vegetation%20survey_Dec13.pdf.

Fortescue Metals Ground Ptd Ltd (FMG) (2021) Clearing permit application CPS 9438/1, received 23 September 2021 (DWER Ref: DWERDT507581).

Government of Western Australia. (2019a) 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

Government of Western Australia (2019b) *2018 South West Vegetation Complex Statistics. Current as of March 2019*. WA Department of Biodiversity, Conservation and Attractions, Perth, https://catalogue.data.wa.gov.au/dataset/dbca

Heddle, E. M., Loneragan, O. W., and Havel, J. J. (1980) *Vegetation Complexes of the Darling System, Western Australia*. In Department of Conservation and Environment, Atlas of Natural Resources, Darling System, Western Australia.

Johnstone, R.E. and Kirkby T. (2008) Carnaby's Cockatoo (Calyptorhynchus latirostris) on the northern Swan Coastal Plain (Lancelin – Perth) Western Australia. Western Australian Museum, Welshpool.

Johnstone, R.E., Johnstone, C. and Kirkby, T. (2011). Black Cockatoos on the Swan Coastal Plain. Report for the Department of Planning, Western Australia.

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

City of Swan (2021) *Advice for clearing permit application CPS 9438/1*, received 12 November 2021 (DWER Ref: DWERDT526356).

Molloy, S., Wood, J., Hall, S., Wallrodt, S. and Whisson, G. (2009) *South West Regional Ecological Linkages Technical Report*, Western Australian Local Government Association and Department of Environment and Conservation, Perth.

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.

PGV Environmental (2021) Supporting information for clearing permit application CPS 9438/1, received 23 September 2021 (DWER Ref: DWERDT507581).

Schoknecht, N., Tille, P. and Purdie, B. (2004) *Soil-landscape mapping in South-Western Australia – Overview of Methodology and output*s Resource Management Technical Report No. 280. Department of Agriculture.

Shah, B. (2006) *Conservation of Carnaby's Black-Cockatoo on the Swan Coastal Plain, Western Australia*. December 2006. Carnaby's Black-Cockatoo Recovery Project. Birds Australia, Western Australia.

Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) *Native Vegetation in Western Australia, Extent, Type and Status*. Resource Management Technical Report 249. Department of Agriculture, Western Australia.

R.E. & Johnstone.C and Kirkby.T (2010) Carnaby's Cockatoo (Calyptorhynchus latirostris), Baudin's Cockatoo (Calyptorhynchus baudinii) and the Forest Red-tailed Black Cockatoo (Calyptorhynchus banksii naso) on the Swan Coastal Plain (Lancelin–Dunsborough), Western Australia. Studies on distribution, status, breeding, food, movements and historical changes.

Valentine, L.E. and Stock, W. (2008) *Food Resources of Carnaby's Black Cockatoo (Calyptorhynchus latirostris) in the Gnangara Sustainability Strategy Study Area*. Edith Cowan University and Department of Environment and Conservation. December 2008.

Western Australian Herbarium (1998-). FloraBase - the Western Australian Flora. Department of Biodiversity, Conservation and Attractions, Western Australia. https://florabase.dpaw.wa.gov.au/ (Accessed 03 November 2021).