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 10277/1
Permit type:	Purpose permit
Applicant name:	Midland Brick Pty Ltd
Application received:	20 July 2023
Application area:	2.09 hectares of native vegetation within a larger footprint of 39.13 hectares
Purpose of clearing:	Clay extraction
Method of clearing:	Mechanical clearing via excavator and bulldozer
Property:	Lot 6 on Deposited Plan 49665
Location (LGA area/s):	Shire of Chittering
Localities (suburb/s):	Muchea

1.2. Description of clearing activities

Midland Brick Pty Ltd is proposing to undertake the clearing of 2.09 hectares of native vegetation within Lot 6 on Deposited Plan 49665, Muchea. The clearing is contained within a single continuous area within a larger 39.13-hectare footprint for the purpose of clay extraction (see Figure 1, Section 1.5).

1.3. Decision on application

Decision:	Granted
Decision date:	30 June 2025
Decision area:	2.09 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 two submissions were received. Consideration of matters raised in the public submissions is summarised in Appendix B.

In making this decision, the Delegated Officer had regard for the site characteristics (see Appendix C), relevant datasets (see Appendix H.1), the findings of an Assessment of Flora and Vegetation Values and Assessment of Black Cockatoo habitat report (Mattiske , 2022) (see Appendix G), the clearing principles set out in Schedule 5 of the EP Act (see Appendix D), relevant planning instruments and any other matters considered relevant to the assessment (see Section 3). The Delegated Officer also took into consideration that the application area is mapped within a Significant Geological Supplies area for clay under the State Planning Policy 2.4: Basic Raw Materials, and that the proposed clearing is for the expansion of an existing clay extraction site. The Delegated Officer also noted that the clay resource is to be used to produce clay product that is an important component for bricks needed for the Perth housing market.

The assessment identified that the proposed clearing will result in:

- the loss of 2.09 hectares of native vegetation that provides significant foraging habitat for forest red-tailed black cockatoo *(Calyptorhynchus banksii naso),* Baudin's cockatoo (*Zanda baudinii)* and Carnaby's cockatoo (*Zanda latirostris*),
- potential impacts to conservation significant fauna if present during the clearing activities,
- 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; and
- potential land degradation in the form of wind erosion and subsurface acidification.

After consideration of the available information, as well as the applicant's minimisation and mitigation measures (see Section 3.1), the Delegated Officer determined that the majority of potential impacts of the proposed clearing, including direct impacts to individual fauna and the potential to facilitate the introduction of weeds and dieback, can be minimised and managed to unlikely lead to an unacceptable risk to environmental values through permit conditioning. However, impacts to significant foraging habitat for Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo remained significant even after the application of minimisation and mitigation measures and constitutes a significant residual impact.

Having considered the environmental impacts outlined above, the applicant's implementation of the mitigation hierarchy, the existing planning framework and relevant other matters, the Delegated Officer determined that, on balance, it was appropriate to grant the clearing permit subject to an adequate environmental offset. The applicant has provided an adequate environmental offset, consistent with the Government of Western Australia's *Environmental Offsets Policy* (2011) and the *Environmental Offsets Guidelines* (2014), to counterbalance the significant residual impacts to significant foraging habitat for Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo (see Section 4).

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,
- undertake slow, progressive one directional clearing to allow terrestrial fauna to move into adjacent habitat ahead of the clearing activity,
- install black cockatoo artificial hollows if black cockatoo habitat trees with evidence of use cannot be avoided; and
- rehabilitate and revegetate 5.59 hectares of native vegetation within Lot 202 on Deposited Plan 403408, Bullsbrook, to provide significant foraging habitat for black cockatoo species and protect in perpetuity under a conservation covenant.

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 polluter pays principle
- 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)
- *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act)

Relevant policies considered during the assessment include:

- *Environmental Offsets Policy* (2011)

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)
- *Environmental Offsets Guidelines* (August 2014)

3 Detailed assessment of application

3.1. Avoidance, minimisation and mitigation measures

The applicant has advised that the following avoidance, minimisation and mitigation measures will be undertaken (Midland Brick, 2023a):

- The proposed clearing area has been carefully thought out to ensure avoidance of unnecessary clearing on site, the areas required to be cleared are located on low levels of overburden material,
- Two trees were identified as having suitable hollows for black cockatoo breeding in the 'Assessment of Flora and Vegetation Values and a Re-Assessment of Black Cockatoos Usage in the Midland Brick Muchea 6 Survey Area' (Mattiske, 2022; Del Botanics 2024). The clay extraction area was modified to avoid these trees.
- Vegetation will not be cleared during black cockatoo breeding seasons (July to January), however should this need to occur, hollows in the trees identified as having large hollows will be checked by a fauna specialist prior to clearing.

As a requirement of Development Approval (DA) granted for the proposal by the Shire of Chittering, the applicant has provided the following management plans to mitigate and manage impacts of the proposed clearing and end land use:

- Dust Management Plan;
- Noise Management Plan;
- Water and Drainage Management Plan;
- Refuelling Management Plan;
- Visual Amenity Management Plan;
- Waste Management Plan;
- Dieback Management Plan;
- Weed Management Plan;

As part of the conditions of the DA, the applicant must demarcate the extraction boundary prior to extraction and must maintain a 10-metre buffer from the dip zone of any trees outside of the approved extraction area (Shire of Chittering, 2023).

The applicant advised that onsite revegetation post extraction can not occur due to not being the landowners of the property on which the clearing will occur (Midland Brick, 2023b).

After consideration of avoidance, minimisation and mitigation measures, it was determined that environmental offsets to counterbalance the significant residual impacts to the following was necessary:

- Loss of 2.09 hectares of native vegetation that provides significant foraging habitat for Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo.

In accordance with the Government of Western Australia's *Environmental Offsets Policy* (2011) and *Environmental Offsets Guidelines* (2014), these significant residual impacts have been addressed through the conditioning of environmental offset requirements on the permit. The nature and suitability of the offset provided are summarised in Section 4.

3.2. Assessment of impacts on environmental values

In assessing the application, the Delegated Officer has had regard for the site characteristics (see Appendix C) 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 **Error! Reference source not found.**) identified that the impacts of the proposed clearing present a risk to biological values (fauna), and 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 (fauna) - Clearing Principles (a) and (b)

Assessment

The application area is located within the Swan Coastal Plain IBRA region. According to available databases a total of 15 conservation significant fauna species have been recorded in the local area (10-kilometre radius of the application area). Of the conservation significant fauna species recorded in the local area, the application area may provide habitat for the following five fauna species:

- *Calyptorhynchus banksii naso* (forest red-tailed black cockatoo) (VU)
- *Zanda latirostris* (Carnaby's cockatoo) (EN)
- *Zanda baudinii* (Baudin's cockatoo) (EN)
- *Dasyurus geoffroii* (chuditch, western quoll) (VU)
- *Isoodon fusciventer* (quenda, southwestern brown bandicoot) (P4)

This assumption is based on the habitat requirements, distribution, mapped vegetation types and the condition of the vegetation. Photos provided by Mattiske Consulting identified that the vegetation within the proposed area was largely consistent with the mapped vegetation types for the area, consisting of *Eucalyptus spp.* and *Corymbia calophylla* open woodlands over mainly introduced grasses and herbs (Mattiske, 2022).

The initial desktop assessment did not identify any records of Baudin's cockatoo within the local area. However, the Black Cockatoo Forage and Breeding Habitat Assessment (Del Botanics, 2024) noted evidence of foraging by Baudin's cockatoo within the application area.

Vegetation condition across the application area ranges from degraded to completely degraded (Keighery, 1994) as well as in the majority of the Muchea 6 extractive industry site. The area has been subject to previous extraction activities and also grazing. The vegetation consists mainly of Eucalyptus wandoo (Wandoo) and Corymbia calophylla (Marri) trees with little understorey remaining over the majority of the area (Mattiske, 2022).

Black cockatoos

Collectively known as black cockatoo species, the forest red-tailed black-cockatoo, Baudin's cockatoo and Carnaby's cockatoo are known to nest in hollows of live and dead trees, including marri (*Corymbia calophylla)*, jarrah (*Eucalyptus marginata*), karri (*Eucalyptus diversicolor*), wandoo (*Eucalyptus wandoo*), tuart (*Eucalyptus gomphocephala*), flooded gum (*Eucalyptus rudis*), and other *Eucalyptus* spp. (DAWE, 2022). The application area is within the known distribution of Carnaby's cockatoo and forest red-tailed black cockatoo, and north of the known distribution of Baudin's cockatoo. However, evidence of foraging by Baudin's cockatoo was identified on site during the Black Cockatoo Forage and Breeding Habitat Assessment (Del Botanics, 2024).

Breeding habitat for black cockatoos includes trees of these species that either have a suitable nest hollow or are of a suitable diameter at breast height (DBH) to develop a nest hollow, where the required DBH to develop a nest hollow is 500 millimetres for most tree species (DAWE, 2022). While breeding, black cockatoos generally forage within a six to 12-kilometre radius of their nesting site (DAWE, 2022). According to available datasets, mapped black cockatoo feeding habitat is recorded within 12 kilometres of the application area, making it a suitable location for breeding if appropriate hollows are present.

The Black Cockatoo Forage and Breeding Habitat Assessment (Del Botanics, 2024) identified:

- Evidence of foraging by Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo on site,
- No evidence of an existing roost (i.e no droppings, feathers etc); and
- Two suitable trees with hollows recorded, displaying evidence of use, located within the avoidance area.

The Assessment of Flora and Vegetation Values and a Re-Assessment of Black Cockatoos Usage on the Midland Brick Muchea 6 Survey Area (Mattiske, 2022) also identified that of the proposed 89 trees to be cleared with diameters at breast height >30cm:

- a total of 12 trees have small hollows which are not suitable for Black-Cockatoos;
- a total of 8 trees have large hollows that are not showing any sign of use by Black-Cockatoos or are not sufficiently suitable dimensions for Black-Cockatoos.
- neither of the two trees highlighted by Kirkby in 2021 will be cleared as part of the proposed expansion.

Noting the applicant has avoided all significant trees (DBH of greater than 500 millimetres) with hollows that show evidence of breeding by black cockatoo species and no evidence of an existing roost was found within the application area, significant impacts to breeding and roosting habitat is not expected to occur as a result of the proposed clearing.

However, given the presence of 8 trees that have large hollows, there may potentially be a small risk that black cockatoo's are utilizing these hollows, even though the habitat assessment did not find signs of use and considered these hollows of not being of sufficient dimensions for black cockatoos.

Black cockatoos forage on a range of plant species, predominantly the seeds and flowers of marri, jarrah and proteaceous species (e.g., *Banksia* spp., *Hakea* spp. and *Grevillea* spp.) (DAWE, 2022). The application area contains *Banksia*, marri and other *Eucalyptus* spp. and provides suitable foraging habitat for black cockatoos. The importance of foraging habitat for black cockatoos increases when it occurs within foraging distance of nesting sites (around 12 km) as it supports breeding effort (DPAW 2013; EPA 2019). Food resources within the range of roost sites are also important to sustain populations of black cockatoos (EPA 2019). There are 12 mapped nesting sites for black cockatoos, within 12 km of the application area, and numerous confirmed roosting sites within 6 km of the application area (the closest being 1.9 kilometres away). This indicates the foraging habitat present within the application area may support breeding effort and roosting birds.

The Black Cockatoo Forage and Breeding Assessment (Del Botanics, 2024) identified approximately 1719.40 hectares of suitable foraging available within six kilometres of the application area and 14095.06 hectares of suitable foraging availability within 12 kilometres of the application area (Del Botanics, 2024). Given this, the proposed clearing is not considered to significantly impact the availability of foraging habitat within the local area.

However, given the proximity of the application area to known black cockatoo roost sites and breeding sites, evidence of foraging within the application area, and the cumulative loss of black cockatoo foraging habitat on the Swan Coastal Plain, the foraging habitat proposed for clearing is considered significant. Therefore, the proposed clearing constitutes a significant residual impact to black cockatoo foraging habitat.

Chuditch

Chuditch are carnivorous marsupials, typically associated with riparian jarrah forest or other forest, woodland or shrubland habitats that contain suitable den sites, including hollow logs and tree hollows, and sufficient prey biomass (DEC, 2012a). Given that the application area comprises mature marri (*Corymbia calophylla*) and *Eucalyptus* spp., the application area may contain suitable habitat for chuditch. However, the application area has little to no understorey so it is possible that the chuditch may occasionally occur within the application area, potentially as transient individuals, however it is unlikely that the taxon would regularly use and rely on habitats within the application area.

Quenda

Quenda are known to inhabit scrubby, often swampy vegetation with dense cover, often feeding in adjacent forest and woodland that is burnt on a regular basis and in areas of pasture and cropland lying close to dense cover. Populations which inhabit jarrah and wandoo forests are usually associated with watercourses. Quendas will thrive in more open habitat subject to exotic predator control. Quenda have become abundant in Lake Magenta Nature Reserve (Western Australia) in Mallee scrub and woodland following fox control (DEC, 2012b). Noting the condition of the vegetation within the application area and lack of wetter areas, it is unlikely that the application area will comprise of significant habitat for the species. It is possible that the quenda may occur within the application area, as it moves through the landscape.

Conclusion
Based on the above assessment, the proposed clearing will result in the loss of 2.09 hectares of significant foraging habitat for Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo. For the reasons set our above, it is considered that the impacts of the proposed clearing on significant foraging habitat for Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo constitutes a significant residual impact that requires an offset (Refer to Section 4).

To ensure no black cockatoos individuals or breeding trees are impacted by the proposed clearing, a condition will be placed on the permit requiring the permit holder to inspect the 8 trees that have large hollows but are not of suitable size and shape for black cockatoos, that are located within the application area, prior to clearing. If there are any signs of use by black cockatoos, these trees must be avoided, if possible. If they cannot be avoided, then the clearing of that tree must not occur until after the breeding season for black cockatoos and replaced with an artificial hollow.

Potential impacts to the other fauna species identified above can be managed by clearing permit conditions as specified below.

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

- directional clearing, which requires, slow progressive, one directional clearing allow terrestrial fauna to disperse ahead of the clearing activity should they occur on site at the time of clearing which will minimise impact to individuals,
- fauna management condition (install black cockatoo nesting hollow), which requires the installation of artificial black cockatoo nesting hollows within Lot 202 on Deposited Plan 403408, Bullsbrook, in case any hollows are being utilised within the application area,
- offset- which requires the rehabilitation and revegetation of 5.59 hectares to provide significant foraging habitat for black cockatoo species within Lot 202 on Deposited Plan 403408, Bullsbrook
- weed and dieback measures will be required as a condition on the clearing permit to mitigate impacts to surrounding vegetation.

3.2.2. Land and water resources (Land degradation) - Clearing Principles (g)

Assessment
The mapped soil types within the application area are part of the Reagan phase and subsystem. Predominantly consisting of Reagen 222Re-1g Phase with gentle slopes of gravelly deep pale sands often over clay duricrust and Reagan 222Re-1x Phase with gentle slopes of loose brown or pale sands with a sandy fabric. The soils within the application area are highly susceptible to wind erosion and subsurface acidification.

Wind erosion
According to available databases, clearing of the proposed native vegetation is likely to have a moderate to high risk of wind erosion. This is due to the sandy nature of the topsoil across the application area. If appropriate management measures such as ground cover or adequate dust suppression on exposed areas are put in place, then the environmental impacts caused by wind erosion can be managed. Ensuring works commence within six months of clearing will minimise exposure of bare soils.

Subsurface acidification
The soil within the application area is mapped as more than 75 per cent presently acidic. The applicant has advised that they expect negligible acid sulphate soil (ASS) material to be bought up to the surface, however if any material is encountered, they will implement the Clay Extraction Management Plan. (Parsons Brinckerhoff, 2006). Noting the extent of the application area and the management plan in place, the proposed clearing is not likely to have an impact on land degradation.

Conclusion
Based on the above assessment, the Delegated Officer has determined that the proposed clearing may lead to appreciable land degradation, however, impacts can be managed with staged clearing.

Conditions
To address the above impacts, the following management measure will be required as a condition on the clearing permit:

- To minimise the risk of wind erosion, the applicant will be required to commence the extraction of materials within six months of the date of clearing, which will prevent the prolonged exposure of bare sandy soils.

3.3. Relevant planning instruments and other matters

Necessity for clearing

The application area is mapped within a Significant Geological Supplies (SGS) area for clay under the State Planning Policy 2.4: Basic Raw Materials (2021). SGS are identified as the highest priority extraction areas for Basic Raw Materials (BRM). SGS are BRM areas identified by the Department of Mines, Industry Regulation and Safety (DMIRS) that represent State significant, strategic and long-term supplies of BRM requiring protection. SGS are significant due to their size of resources, relative scarcity, demand and or location near growth areas and transport routes. These areas should be considered during the planning and approvals process.

The applicant has advised the clay for extraction, within the application area, will be used to produce quality clay product that is vital in producing bricks for the Perth housing market (Midland Brick, 2023a).

Other Approvals

The Shire of Chittering (the Shire) advised DWER that local government approvals are required, and that the proposed clearing is consistent with the Shire's Local Planning Scheme. The Shire did not have any objections to the proposed clearing. The Shire granted Development Approval for Extractive Industry- Clay on the 14 December 2022 and an Excavation Licence on the 28 February 2023.

The application area occurs within the Gingin Groundwater Area under the Rights in Water and Irrigation Act, 1918 (RIWI Act). The applicant has advised that they do not require groundwater for dust suppression or require to dewater for the proposed purpose of clearing. Therefore, no approvals under the RIWI Act are required for the proposal.

On 15 November 2022, the proposal was referred to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) under the EPBC Act (Reference: EPBC 2022/09342). DCCEEW determined that the proposed action was a controlled action under the EPBC Act and is still under assessment.

One Aboriginal sites of significance has been mapped within the application area. The applicant has provided a management plan, outlining heritage management within their supporting information. It is the permit holder's responsibility to comply with relevant legislation and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

4 Suitability of offsets

Through the detailed assessment outlined in Section 3.2 above, the Delegated Officer has determined that the following significant residual impacts remain after the application of the avoidance and mitigation measures summarised in Section 3.1:

- The loss of 2.09 hectares of native vegetation that provides significant foraging habitat for Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo.

The applicant proposed an environmental offset consisting of the revegetation and rehabilitation of 5.59 hectares of native vegetation that provides significant foraging habitat for Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo within Lot 202 on Deposited Plan 403408, Bullsbrook, which is located approximately 14 kilometres south of the application area.

The proposed revegetation is supported by a Revegetation Plan that is consistent with DWER's Guide to preparing Revegetation Plans for Clearing Permits. DWER considers the methods, species lists and monitoring methodology are sufficient to ensure the offset can be achieved.

Lot 202 is currently zoned Freehold. The area of rehabilitation will be conserved in perpetuity through the application of a conservation covenant under section 30B of the *Soil and Land Conservation Act 1945*.

Lot 202 is in a Completely Degraded to Degraded (Keighery) condition (Del Botanics, 2024) and consists of Marri-wandoo woodland and *Banksia* shrubland (Del Botanics, 2024). Noting the presence of some species commonly associated with black cockatoo foraging habitat (albeit of limited density), DWER considers that the proposed offset site represents an appropriate site for rehabilitation to counterbalance the abovementioned significant residual impacts.

Given the above, the Delegated Officer considers the proposed offset is consistent with the *WA Environmental Offsets Policy* (2011) and the *WA Environmental Offsets Guidelines* (2014), and that it adequately counterbalances the significant residual impacts to native vegetation that is significant foraging habitat for Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo. The justification for the values used in the offset calculation is provided in Appendix F.

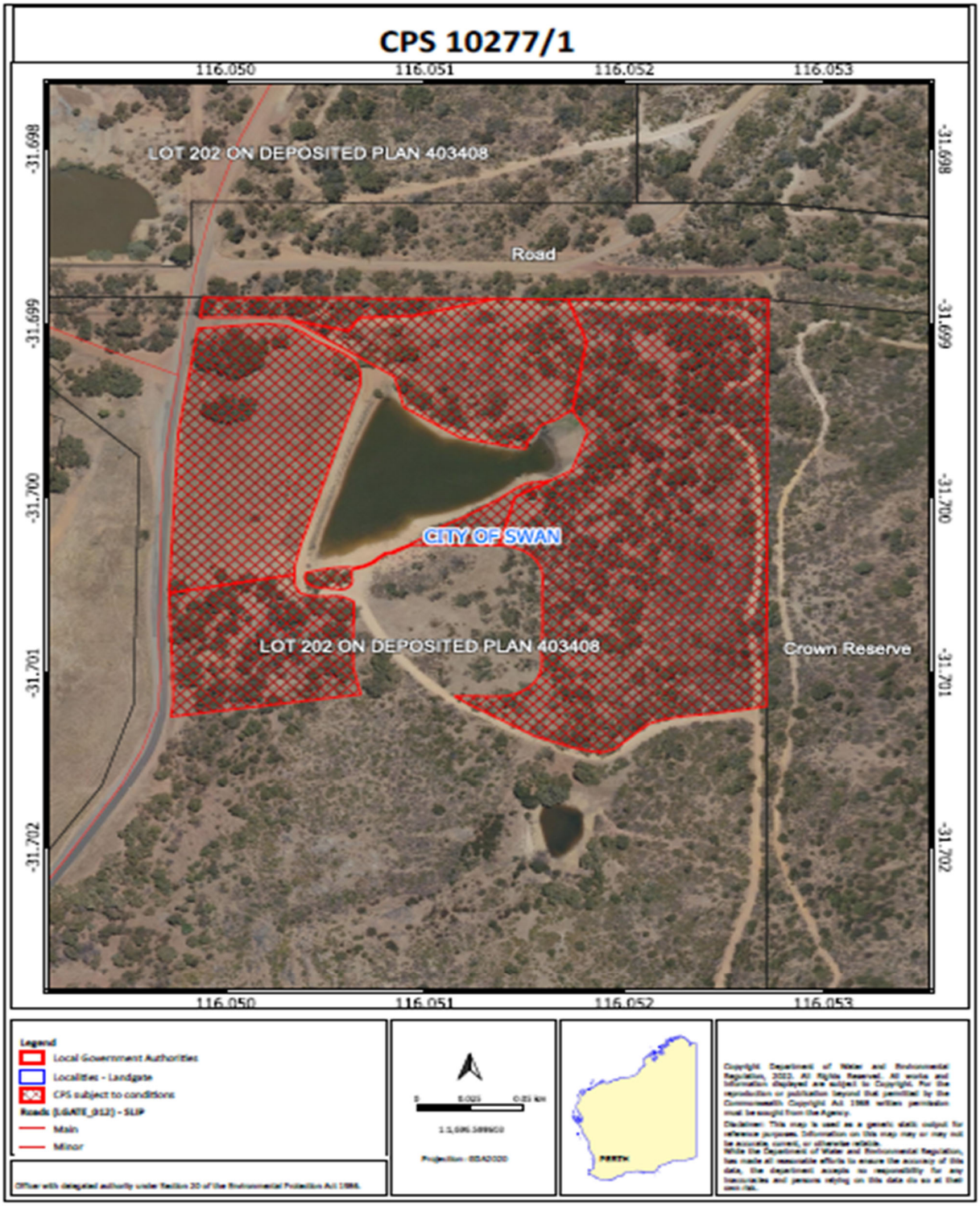

Figure 2. Map of the revegetation offset area at Lot 202 on Deposited Plan 403408, Bullsbrook. The area cross hatched red indicates the area to be revegetated.

End

Appendix A. Additional information provided by applicant

Summary of comments	Consideration of comment
Response to request for information dated 3 October 2023	See section 4.
The applicant provided the identification of a satisfactory environmental offset to counterbalance significant residual impacts to black cockatoos foraging habitat dated 4 June 2025	See section 4.

Appendix B. Details of public submissions

Two submissions were received raising seven grounds in total, with supporting information provided as comments under each ground of submission. Where the comments within the grounds of submission raised similar concerns, they have been combined in the summary table below to provide a streamlined approach.

Summary of comments	Consideration of comment
The removal of trees along the ridgeline will be detrimental to groundwater downslope.	The majority of vegetation on the ridgeline will be retained, the remainder will require revegetation and rehabilitation of the proposed area, and this will be conditioned on the permit.
Revegetation and rehabilitation measures should increase to ensure foraging habitat for black cockatoos and support groundwater protection.	DWER's assessment identified that revegetation and rehabilitation of a 5.59 ha offset area is required to reduce the significant residual impact to environmental values including black cockatoo foraging habitat (See Section 4)
A cumulative impact assessment report should be considered for the Muchea 6 site.	DWER has assessed cumulative impacts to the local area under principle (e) and (b). (See Appendix C)
The vegetation extent of the Muchea site is less than the national threshold level of 30%	DWER's assessment of vegetation extent within the local area (10 km radius) is beyond the recommended greater than 30% retention required to conserve biodiversity. (See Section C.2 – principle (e) for vegetation extent).
No guarantee that the hollow bearing trees suitable for black cockatoo breeding will be retained.	The assessment of this clearing permit application is supported by the findings of flora, vegetation, and fauna assessments (Mattiske, 2022) and a re-assessment of black cockatoo usage (Del Botanics, 2024) of the proposed site. Two hollow bearing trees with evidence of usage identified in the habitat assessment will be retained and do not occur within the area permitted to be cleared. A condition has also been placed on the permit to inspect all trees within the permit area prior to clearing for signs of hollow use by black cockatoos, if signs of use are observed, the tree must be replaced by an artificial hollow if it cannot be avoided. (See Appendix G)
The application does not address the impacts of the proposed activities to black cockatoo breeding i.e. noise pollution, increased traffic, removal of foraging trees.	DWER undertakes environmental impact assessments for clearing permit applications based on the potential environmental impacts that result from the clearing of native vegetation. Under the approved development approval, the applicant has provided noise and traffic management plans (See Section 3.2.1)
How are black cockatoos expected to survive with even less suitable habitat currently existing, what is the duration of time for marri and jarrah trees to become of hollow bearing size?	The clearing permit was submitted, accepted, assessed, and determined in accordance with sections 51E and 51O of the EPBC Act. DWER has determined that there is a significant residual impact to

Summary of comments	Consideration of comment
Established vegetation must be protected and enhanced to rebuild the drastic loss of original vegetation.	environmental values as a result of the clearing and an offset is required. (See Section 4).

Appendix C. Site characteristics

C.1. Site characteristics

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

Characteristic	Details
Local context	The application area is a 2.09-hectare isolated patch of native vegetation in a highly cleared agricultural landscape located within the intensive land use zone of Western Australia. It is surrounded by cleared farmland and a Western Australian Meat Industry site directly west of the application area. The local area (10-kilometre radius from the centre of the application area) retains approximately 40.31 per cent of the original native vegetation cover.
Ecological linkage	There are no mapped formal ecological linkages found within the application area and is not considered likely to form any informal linkage due to the area consisting of mostly isolated trees.
Conservation areas	No conservation areas are found within the application area. The closest conservation area is Bush Forever site 79 which is located approximately 3.3 kilometres southeast of the application area.
Vegetation description	Photographs and an assessment of flora and vegetation survey supplied by the applicant indicates that the vegetation within the application area consists of several native species of *Amaranthaceae, Asteraceae, Myrtaceae* and *Xanthorrhoeaceae.* (Mattiske, 2022). A full list of flora within the application area and site photos can be found in Appendix G. This is consistent with the mapped vegetation types: • Reagan 65: Vegetation ranges from low open woodland of *Banksia sp. Eucalyptus todtiana* (Pricklybark) to closed heath depending on depth of soil. • Mogumber South 59: Open woodland of *Corymbia calophylla*, with some admixture of *Eucalyptus marginata* (Jarrah) and a second storey of *Eucalyptus todtiana* (Pricklybark) - *Banksia attenuata* - *Banksia menziesii* (Firewood Banksia) - *Banksia ilicifolia* (Holly-leaved Banksia). The mapped vegetation types retain approximately 33.84 and 38.6 per cent respectively of the original extent (Government of Western Australia, 2019).
Vegetation condition	Photographs supplied by the applicant and a flora and vegetation survey (Mattiske, 2022) indicate that the native vegetation within the application area is sparse, with vegetation is in a Degraded to Completely Degraded condition (Keighery, 1994). The full Keighery (1994) condition rating scale is provided in Appendix E. Representative photos are available in Appendix G.
Climate and landform	The climate of Western Australia is described as having a Mediterranean-type climate of mild, wet winters and warm to hot, dry summers. The mean annual rainfall for Muchea is 720 millimetres. The application area is at an altitude of 115-155 meters above sea level.

Characteristic	Details
Soil description	The soils within the application area are mapped as: • Reagan 1x Phase which is described as Gentle Slopes of loose brown or pale sands with a sandy fabric. Low woodland or shrubland with scattered low trees *B.prionotes, Nuytsia floribunda, Adenanthos* and stunted *Eucalyptus marginata*. • Reagan 5 subsystem which is described as Level to very gently inclined swampy drainage lines with poorly drained grey siliceous and pale yellow-brown sands. Low woodland of *Eucalyptus calophylla wandoo*, some *Eucalyptus marginata*. *Melaleucas, Eucalyptus rudis* and reeds in wet areas. • Reagan 1g Phase which is described as Gentle slopes of gravelly deep pale sands often over clay or duricrust. Very low woodland and shrubland with scattered low trees. *B.prionotes, Nuytsia floribunda, Adenanthos* and a few stunted *E. marginata*
Land degradation risk	The soils in the application area have a high risk of wind erosion and subsurface acidification (DPIRD, 2023)
Waterbodies and Hydrogeography	The desktop assessment and aerial imagery indicated that no wetlands or watercourses within the application area. The application area is mapped within 100 metres of Multiple Use Palusplain UFI 12551 and 1.2 kilometres of Multiple Use Palusplain Ellen Brook Floodplain. The application area falls within the Gingin Groundwater Area and the Swan River System Surface Water Area, as proclaimed under the *Rights in Water and Irrigation Act 1914* (RIWI Act). Groundwater salinity within the application area is mapped at 1000-7000 milligrams per total dissolved solids. The proposed clearing is not considered likely to negatively impact any waterbodies within the surrounding area.
Flora	The desktop assessment identified that a total of 42 conservation significant flora species have been recorded within the local area. None of these existing records occur within the application area, with the closest record being an occurrence of *Adenanthos cygnorum subsp. chamaephyton (*P3) approximately 0.9 kilometres from the application area. With consideration for the site characteristics set out above, relevant datasets (See Appendix H), the habitat preferences and conservation statuses of the aforementioned species, the distribution and extent of existing records, and biological survey information (Mattiske, 2022), the application area is unlikely to provide suitable habitat for threatened or priority flora species and impacts to flora species did not require further consideration.
Ecological communities	The desktop assessment identified that the application area is partially within a mapped occurrence of the Banksia Woodlands TEC, which is listed as Endangered under the Commonwealth EPBC Act and is considered a Priority 3 PEC by DBCA in Western Australia. The Assessment of Flora and Vegetation values did not identify any Threatened Ecological Communities (TEC) or PECs within the application area (Mattiske, 2022) and did not require further consideration.
Fauna	The desktop assessments identified that a total of 15 threatened or priority fauna species have been recorded within the local area, including five threatened fauna species, seven priority fauna species and three other specially protected species (DBCA, 2007-) None of these existing records occur within the application area, with the closest record being an occurrence of *Plegadis falcinellus* approximately 0.6 kilometres from the application area.

Characteristic	Details
	There are 12 known black cockatoo breeding sites and five known roost sites within four kilometres of the application area. With consideration for the site characteristics set out above, relevant datasets (See Appendix H), the habitat preferences of the aforementioned species, and biological survey information (Mattiske, 2022), the application area may provide suitable habitat for five conservation significant fauna species and impacts to these species required further consideration (see section 3.2.1)

C.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	1501221.93	579813.47	38.62	222916.97	14.85
Vegetation complex Dandaragan Plateau					
Reagan 65	9180.69	3106.85	33.84	605.91	6.6
Mogumber South 59	14821.71	5720.70	38.60	1029.42	6.95
Local area					
10km radius	34255.68	13809.60	40.31	-	-

*Government of Western Australia (2019)

C.3. Fauna analysis table

Species name	Conservation status	Suitable habitat features? [Y/N]	Suitable vegetation type? [Y/N]	Distance of closest record to application area (km)	Number of known records (total)	Are surveys adequate to identify? [Y, N, N/A]
Calyptorhynchus banksii naso (forest red-tailed black cockatoo)	VU	Y	Y	3.2	145	Y
Dasyurus geoffroii (chuditch)	VU	Y	Y	4.6	1	Y
Isoodon fusciventer (quenda)	P4	N	Y	8.5	11	Y
Zanda latirostris (Carnaby's cockatoo)	EN	Y	Y	2	1414	Y
Zanda sp. 'white-tailed black cockatoo' (white-tailed cockatoo)	EN	Y	Y	4.8	528*	Y

T: threatened, CR: critically endangered, EN: endangered, VU: vulnerable, P: priority
* An additional 528 records of Zanda sp. 'white-tailed black cockatoo' (white-tailed cockatoo) were recorded in the local area, which may comprise either of these species.

Appendix D. 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 application area does contain significant habitat for conservation significant fauna including black cockatoo species. No conservation significant flora or vegetation communities have been recorded within the application area (Mattiske, 2022).	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 application area contains significant foraging, roosting, and breeding habitat for black cockatoo species. An environmental offset is required to counterbalance this impact, noting the applicant has considered and actioned measures to avoid and minimise the extent of clearing.	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 application area is unlikely to contain habitat for threatened flora and no threatened flora has been identified within the application area during a flora survey (Mattiske, 2022)	Not 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: The application area is unlikely to be representative of any TEC listed under the BC Act or EPBC Act (Mattiske, 2022).	Not at variance	No
Environmental value: significant remnant vegetation and conservation areas		
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 mapped vegetation type and vegetation extent in the local area is consistent with the national objectives and targets for biodiversity conservation in Australia. The local area contains approximately 40 per cent of its pre-European extent and is not considered an extensively cleared landscape. The vegetation proposed to be cleared is not considered to be part of a significant ecological linkage in the local area given its scattered, sparse distribution and degraded condition.	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: Given the distance to the nearest conservation area, the proposed clearing is not likely to have an impact on the environmental values of nearby conservation areas.	Not 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."*	Not at variance	No

Assessment against the clearing principles	Variance level	Is further consideration required?
Assessment: Given no water courses or wetlands are recorded within the application area, the proposed clearing is not within an environment associated with a watercourse or wetland.		
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 highly susceptible to wind erosion and subsurface acidification. Noting the extent of the application area, management plans in place and the condition of the vegetation, the proposed clearing is not likely to have an appreciable impact on land degradation.	Not likely to be at variance	Yes *Refer to Section 3.2.2, above.*
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 no water courses or wetlands are recorded within the application area, the proposed clearing is unlikely to impact surface or ground water quality. The application intersects the Swan Groundwater area and the Swan River System area (RIWI Act, Surface Water Area) however given the extent of clearing, and the management plan in place, it is unlikely that the proposed clearing will cause significant impact to the quality of the ground or surface water. No approvals under the RIWI Act are required for the proposal.	Not likely to be at variance	No
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 and topographic contours in the surrounding area do not indicate the proposed clearing is likely to contribute to increased incidence or intensity of flooding.	Not likely to be at variance	No

Appendix E. 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

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.

Condition	Description
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 F. Offset calculator value justification

Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo foraging habitat

WA Environmental Offsets Calculator
Rationale for scores used in the offset calculator

Calculation	Score (Area)	Rationale
Conservation significance		
Description	Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo foraging habitat	The proposed clearing will impact on 2.09 hectares of significant foraging habitat for Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo.
Type of environmental value	Species (flora/fauna)	Carnaby's cockatoo and Baudin's cockatoo are listed as Threatened fauna species and forest red-tailed black cockatoo is listed as a Vulnerable fauna species under the Commonwealth EPBC Act and state BC Act.
Conservation significance of environmental value	Rare/threatened species - endangered	Carnaby's cockatoo and Baudin's cockatoo are listed as Endangered, and forest red-tailed black cockatoo is listed as Vulnerable under both the EPBC Act and BC Act.
Landscape-level value impacted	yes/no	The impact is to an area of foraging habitat in hectares.
Significant impact		
Description	Clearing of native vegetation that comprises significant foraging habitat for Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo.	Native vegetation that comprises significant foraging habitat for Baudin's cockatoo, Carnaby's cockatoo and forest red-tailed black cockatoo is proposed to be cleared for the clay extraction.
Significant impact (hectares) / Type of feature	2.09	Based on information available from the Assessment of Flora and Vegetation Values and a Re-Assessment of Black Cockatoos Usage on the Midland Brick Muchea 6 Survey Area (Mattiske, 2022; Del Botanics, 2024) the proposed clearing composes of Marri, Jarrah and Wandoo over minimal understorey which provides primary foraging for Baudin's cockatoo, Carnaby's cockatoo and forest red-tailed black cockatoo on the Swan Coastal Plain.
Quality (scale) / Number	6.00	Based on the available information from the Assessment of Flora and Vegetation Values and a Re-Assessment of Black Cockatoos Usage on the Midland Brick Muchea 6 Survey Area (Mattiske, 2022; Del Botanics, 2024) the proposed clearing area consists of scattered Marri, Jarrah and Wandoo in Degraded (Keighery, 1994) condition. In addition, the application is located within 10 kilometres of approximately 5 mapped roost sites and 12 known breeding sites. The application is also located within an extensively cleared part of

Calculation	Score (Area)	Rationale
		the species' range and available foraging habitat in the local area is limited. It is noted that the Wandoo within the application area may be used for foraging but is not preferred relative to the jarrah and marri.
Rehabilitation credit		
N/A	N/A	No onsite rehabilitation or revegetation proposed (i.e., within the application area).
Offset		
Description	Revegetation and rehabilitation of native vegetation that comprises significant foraging habitat for Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo	An offset involving the revegetation of native vegetation within Lot 202 Great Northern Highway, Bullsbrook. The offset site consists of two areas of different starting quality.
Proposed offset (area in hectares)	2.00	The revegetation of 2.00 hectares of native vegetation that comprises significant foraging habitat for Baudin's cockatoo, Carnaby's cockatoo and forest red-tailed black cockatoo is required to offset the SRI, which, in combination with the proposed offset involving the revegetation of an adjacent area of higher starting quality within the same Lot, is adequate to counterbalance the SRI.
	3.59	The revegetation of 3.59 hectares of native vegetation that comprises significant foraging habitat for Baudin's cockatoo, Carnaby's cockatoo and forest red-tailed black cockatoo is required to offset the SRI.
Current quality of offset site / Start number (of type of feature)	2.00	Evidence of foraging by black cockatoos was observed in the offset site, but the value is low due to the scattered and sparse density of available foraging habitat. However, the revegetation offset area is located adjacent to Walyunga National Park and within six kilometres of seven recorded roost sites and occurs in proximity of multiple waterbodies.
	5.00	Evidence of foraging by black cockatoos was observed in the offset site was low due to limited mid storey and understorey. However, the revegetation offset area is located adjacent to Walyunga National Park and within six kilometres of seven recorded roost sites and occurs in proximity of multiple waterbodies.
Future quality WITHOUT offset (scale) / Future number WITHOUT offset	2.00	Expected to remain the same without offset
	5.00	Expected to remain the same without offset

Calculation	Score (Area)	Rationale
Future quality WITH offset (scale) / Future number WITH offset	6.00	The Applicant has prepared a Project Revegetation Plan following DWER's Guide to preparing revegetation plans for clearing permits (2018). Area will be revegetated with high quality foraging habitat for black cockatoo species. The future quality with offset considers the current quality of the site and the contextual factors of the revegetation area including proximity to roost sites, waterbodies and within an extensively cleared part of the species range.
	8.00	The Applicant has prepared a Project Revegetation Plan prepared following DWER's Guide to preparing revegetation plans for clearing permits (2018). The future quality with offset considers the contextual factors of the revegetation area including proximity to roost sites, waterbodies and within an extensively cleared part of the species range
Time until ecological benefit (years)	16.00	It is assumed that the benefits of revegetation of Carnaby's cockatoo, Baudin's cockatoo and forest red-tailed black cockatoo foraging habitat will be available after 15 years. An extra year has been allowed to account for the commencement of the revegetation.
Confidence in offset result (%)	0.8	There is a moderate level of confidence that the offset will achieve the predicted result given revegetation and rehabilitation will be undertaken in accordance with a Project Revegetation Plan prepared following DWER's Guide to preparing revegetation plans for clearing permits (2018).
Duration of offset implementation (maximum 20 years)	20.00	The offset site will be conserved and managed in perpetuity under a conservation covenant. Therefore, the maximum of 20 years is applied.
Time until offset site secured (years)	1.00	It is assumed that the revegetation offset site will be placed under a conservation covenant within 1 year of clearing, when the revegetation has begun to establish
Risk of future loss WITHOUT offset (%)	15.0%	The offset site is currently zoned rural or similar and is not subject to any existing planning approvals
Risk of future loss WITH offset (%)	5.0%	The future conservation (in perpetuity) of the offset site would result in a substantial increased security and substantially reduce the risk of loss.
Offset ratio (Conservation area only)	N/A	
Landscape level values of offset?	N/A	

Appendix G. Biological survey information excerpts and photographs of the vegetation (Mattiske, 2022; Del Botanics, 2024)

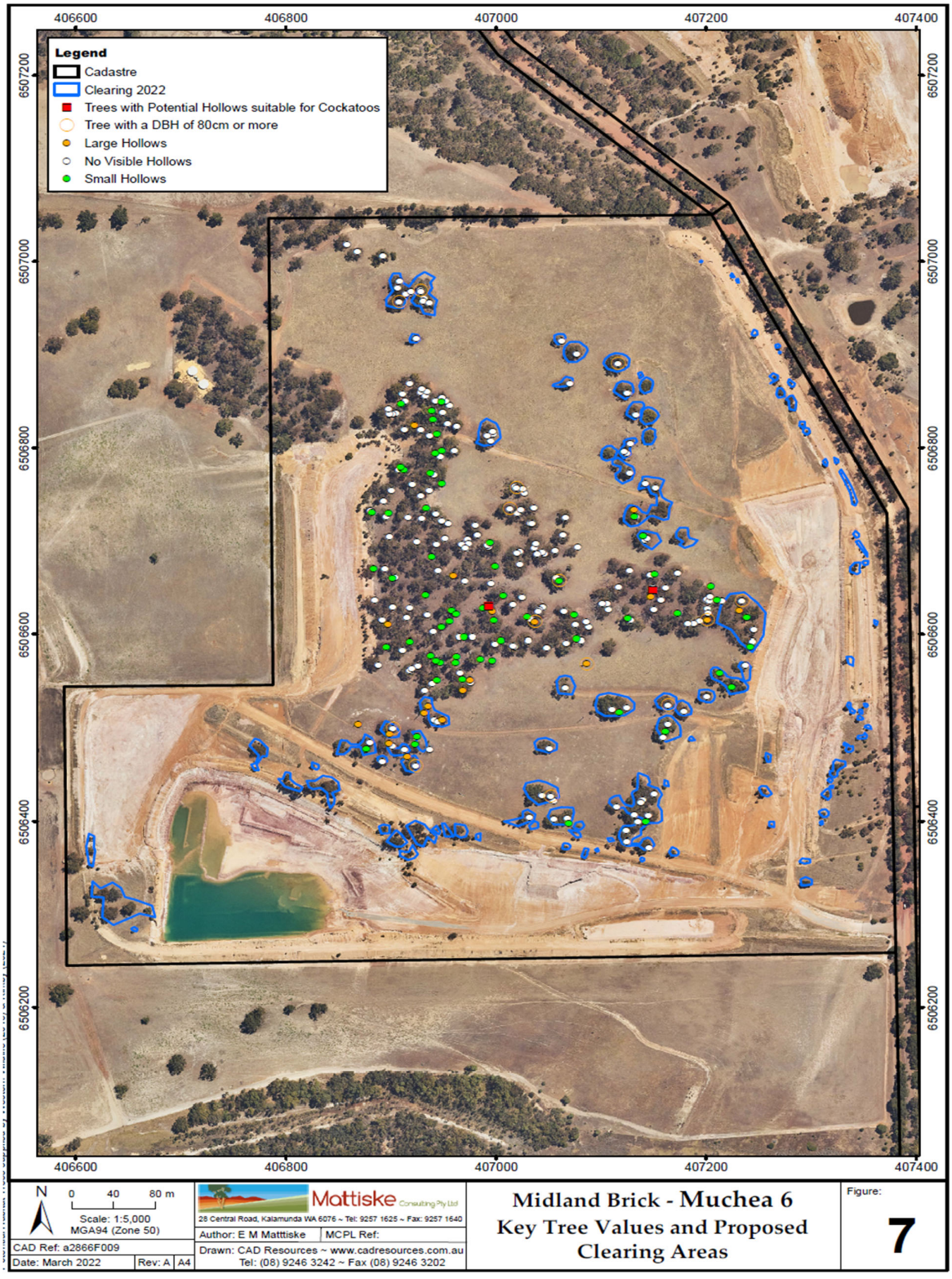

Figure 2. Muchea 6, Key Tree Values and Proposed Clearing Areas (Mattiske, 2022)

Figure 3. Woodland of *Eucalyptus wandoo- Corymbia calophylla* in small gully on southern section of the Muchea 6 area (Mattiske, 2022).

Figure 4. Woodland of *Eucalyptus wandoo- Corymbia calophylla* in central section of remnant trees on the Muchea 6 area (Mattiske, 2022).

Figure 5. Woodland of *Eucalyptus wandoo* in northern section of remnant trees on the Muchea 6 area (Mattiske, 2022).

Figure 6. Tree 1141 (407149E 6506647N) showing extensive chewing. Highly likely a black cockatoo breeding hollow (Mattiske, 2022)

Figure 7. Tree 1148 (406993E 6506630N) showing internal chewing. Highly likely a black cockatoo breeding hollow (Mattiske, 2022)

Family	Species
Amaranthaceae	*Ptilotus polystachyus*
Asteraceae	**Hypochaeris glabra* **Ursinia anthemoides*
Boraginaceae	**Echium plantagineum*
Myrtaceae	*Corymbia calophylla* *Eucalyptus wandoo*
Poaceae	**Avena fatua* **Briza maxima* **Bromus diandrus* **Ehrharta calycina* **Ehrharta longiflora* **Lolium rigidum*
Xanthorrhoeaceae	*Xanthorrhoea preissii*

Figure 8. Vascular plant species recorded on Muchea 6, 2021. Note: * denoted introduced species (Mattiske, 2022)

Figure 9. Evidence of foraging by Baudin's cockatoo, Carnaby's cockatoo and forest red-tailed black cockatoo within the application area (Del Botanics, 2024)

Figure 10. Evidence of foraging by forest red-tailed black cockatoo within the application area (Del Botanics, 2024)

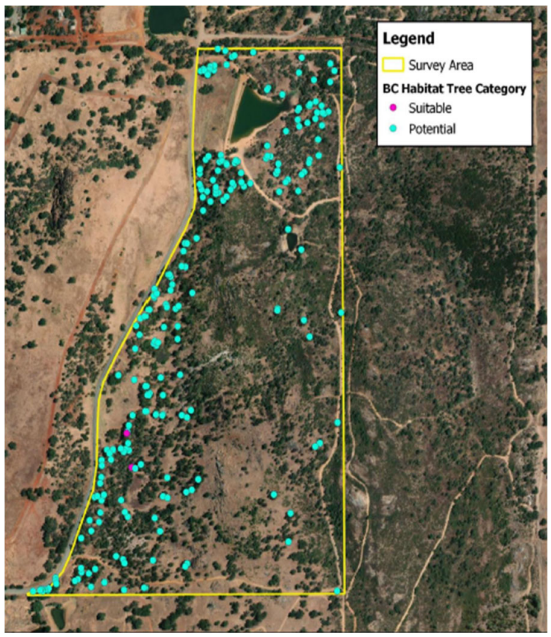

Figure 11. Potential black cockatoo habitat trees within the offset area (Del Botanics, 2024)

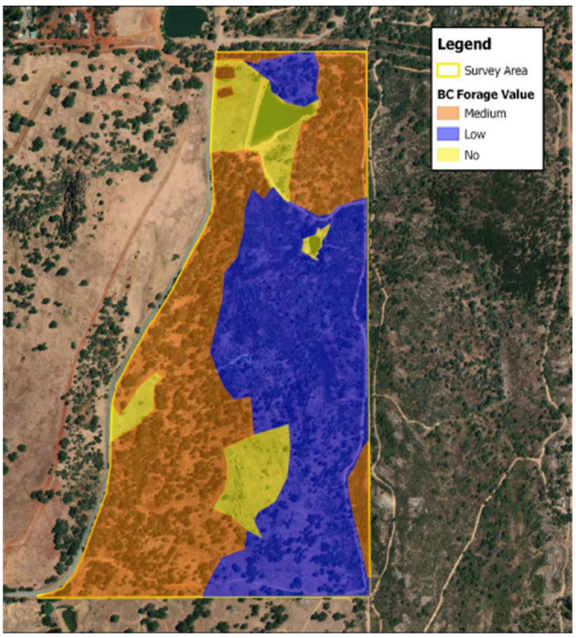

Figure 11. Black cockatoo forage habitat values within the offset area (Del Botanics, 2024)

Appendix H. Sources of information

H.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)
- 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

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)

H.2. References

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

Commonwealth of Australia (2017) Revised draft referral guideline for three threatened black cockatoo species: Carnaby's Cockatoo, Baudin's Cockatoo and the Forest Red-tailed Black Cockatoo.

Department of Agriculture, Water and the Environment (DAWE) (2022). *Referral guideline for 3 WA threatened black cockatoo species: Carnaby's cockatoo, Baudin's cockatoo and the forest red-tailed black cockatoo,* Department of Agriculture, Water and the Environment, Canberra. Available from: Referral guideline for 3 WA threatened black cockatoo species - DCCEEW.

Department of Environment and Conservation (DEC) (2012a). *Fauna profiles: Chuditch, (Dasyurus geoffroii)*. Recovery Plan. Wildlife Management Program No. 54. Department of Environmental and Conservation, Western Australia.

Department of Environment and Conservation (DEC) (2012b). *Fauna profiles: Quenda, (Isoodon obesulus fusciventer)*. Department of Environmental and Conservation, Western Australia.

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) (DPAW) (2013). *Carnaby's cockatoo (Calyptorhynchus latirostris) Recovery Plan.* Western Australian Department of Parks and Wildlife (Now the Department of Biodiversity, Conservation and Attractions). 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 31 August 2023).

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.

Department of Water and Environmental Regulation (DWER) (Regulatory Services – Water) (2023) *Rights in Water and Irrigation Act 1914 advice for clearing permit application CPS 10277/1*, received 5 September 2023 (DWER Ref: DWERDT837688).

Del Botanics Environmental Consulting (2024) *Basic Fauna Survey and Black Cockatoo Habitat Assessment.* Received 11 May 2025. (DWER Ref: DWERDT1088457)

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.

Environmental Protection Authority (EPA) (2016). *Technical Guidance – Terrestrial Fauna Surveys.* Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Tech%20guidance-%20Terrestrial%20Fauna%20Surveys-Dec-2016.pdf.

Environmental Protection Authority (EPA) (2019). *EPA Technical Report: Carnaby's Cockatoo In Environmental Impact Assessment in the Perth and Peel Region.* Advice of the Environmental Protection Authority under Section 16(j) of the Environmental Protection Act 1986. Environmental Protection Authority, Western Australia.

Government of Western Australia (2019) *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

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

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.

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

Shire of Chittering (2023) *Advice for clearing permit application CPS 10277/1*, received 7 September 2023 (DWER Ref: DWERDT828584).

Mattiske Consulting Pty Ltd (2022) *Assessment of Flora and Vegetation Values and a Re-Assessment of Black Cockatoos Usage on the Midland Brick Muchea 6 Survey Area,* received 20 July 2023 (DWER Ref: DWERVT13274)

Mattiske, E.M. and Havel, J.J. (1998) *Vegetation Complexes of the South-west Forest Region of Western Australia.* Maps and report prepared as part of the Regional Forest Agreement, Western Australia for the Department of Conservation and Land Management and Environment Australia.

Midland Brick Pty Ltd (2023a) *Clearing permit application and supporting information for CPS 10277/1*, received 20 July 2023 (DWER Ref: DWERVT13274).

Midland Brick Pty Ltd (2023b) *Response to request for further information for CPS 10277/1*, received 31 October 2023 (DWER Ref: DWERDT858936)

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.

Parsons Brinckerhoff (2006) *Acid Sulphate Soil Investigation & Management Plan Lot 6 Wandena Road Muchea WA,* received 31 October 2023 (DWER Ref: DWERDT858936)

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.

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.

Submission (2023a) *Public submission in relation to clearing permit application CPS 10277/1,* received 19 September 2023 (DWER Ref: DWERDT838639).

Submission (2023b) *Public submission in relation to clearing permit application CPS 10277/1,* received 20 September 2023 (DWER Ref: DWERDT837660).

Western Australian Herbarium (1998-). *FloraBase - the Western Australian Flora*. Department of Biodiversity, Conservation and Attractions, Western Australia. https://florabase.dpaw.wa.gov.au/ (Accessed September 2023)