

- Legend**
- | | |
|--|---|
| Development Envelope | Fauna Habitats |
| ★ GOV Towns | Cleared |
| — Major Roads | Drainage Line/River/Creek (major) |
| — Fortescue Rail | Drainage Line/River/Creek (minor) |
| — Roy Hill Rail | Gorges/Gullies |
| ● Turbine Locations | Granite Outcrops (flat dome) |
| Indicative Disturbance Footprint | Hills/Ranges/Plateaux |
| Approved Disturbance (Nullagine Pilot Wind Farm) | Plain (Cracking clays) |
| ● SRE Records - Chilopoda, Diplopoda, Entognatha and Gastropoda | Plain (stony/gibber) |
| | Rocky Escarpments (Ridges/Mesa/Cliffs/Outcrops/Breakaways) |
| | Woodland (closed) |
| | Woodland (open) |

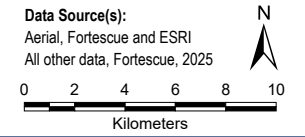


Figure 8-11-4
 Short-range Endemics (SRE) occurrences within the Development Envelope

Requested By: R. Dorji Date: 1/29/2026
 Drawn By: R. Kerr Size: A4L
 Revised By: rykerr Revision: 0
 Approved By: Confidentiality: 0
 Scale: 1:300,000
 Coordinate System: GDA 1994 MGA Zone 50
 Project Name: 4519OP002_MP_EN_0093_PartIV_2
 Document Name: 4519OP002_MP_EN_0093_027d_r0_SRE_Habitats
 Fortescue accepts no liability and gives no representation or warranty, express or implied, as to the information provided including its accuracy, completeness, merchantability or fitness for purpose.





[This page has been left blank intentionally]



8.4.7 Introduced Fauna

Three introduced fauna species were recorded within the DE and/or immediate surrounds (ecologia, 2025b) including:

- European Cattle (*Bos primigenius taurus**),
- Cat (*Felius catus*), and
- House Mouse (*Mus musculus*).

8.5 Potential Impacts

The Proposal activities that may impact terrestrial fauna include:

- Habitat loss from clearing terrestrial vertebrate fauna and SRE habitat in the IDF to accommodate Proposal infrastructure, including access roads, turbine pads, and substations,
- Fauna injury, mortality and disturbance due to increased vehicle movement during the construction and operational phases,
- Habitat fragmentation and behavioural change due to the long-term (up to 30 years) operation of the wind farm, which includes the turbine movements and operation of the Proposal infrastructure, and
- Behavioural changes resulting from disturbance due to general construction and operational-related activities (i.e., noise, vibration, artificial light and increase in human activities).

The potential impacts on terrestrial fauna arising from these activities include:

- Direct impacts:
 - Clearing of fauna habitat (including SRE) within the DE, including permanent and temporary clearing,
 - Clearing habitat critical to the survival of Threatened Species (Grey Falcon; Northern Quoll; PLNB, Ghost Bat, Night Parrot, Pilbara Olive Python; Peregrine Falcon),
 - Clearing critical supporting habitat for the Northern Quoll,
 - Clearing supporting habitat for Threatened Species, Priority Species and Migratory Species,
 - Barrier effects to fauna movement from turbine placement, access roads and electrical reticulation,
 - Avifauna (i.e. bird) and bat collisions with wind turbines as well as possible barotrauma,



- Avifauna (i.e. bird) and bat injury or mortality through electrocution from electrical reticulation, and
- Fauna mortality through collision with vehicles during construction and operational phase.
- Indirect impacts:
 - Habitat degradation from impacts on vegetation health
 - Introduction of invasive weed species and/or feral animals,
 - Potential increase of artificial nesting or use of artificial features as habitat,
 - Disruption to behaviour of fauna from artificial lighting, dust, noise and vibration, and
 - Increased risk of bushfires associated with construction activities and operation of new electrical infrastructure.
- Cumulative impacts:
 - Combined impacts from clearing of fauna habitats associated with the Proposal and other developments in the surrounding area,
 - Combined impacts from clearing of habitat critical to the survival of Threatened Species associated with the Proposal and other developments in the surrounding area, and
 - Combined disturbance to Threatened and Migratory Species from construction and operational activities associated with the Proposal and other developments in the surrounding area.



8.6 Mitigation

During the planning and design process for the Proposal, the mitigation hierarchy (avoid, minimise and rehabilitate) was applied to assess, avoid and minimise potential impacts to terrestrial fauna as far as practicable. Following completion of the fauna surveys, the data was reviewed against the Proposal design to minimise and where possible avoid clearing of habitat for significant species. As discussed in Section 3.1.2, initial designs included up to 200 turbines and an estimated IDF of approximately 2,044 ha. However, through an iterative assessment process and implementation of the mitigation hierarchy, the design has been refined to reduce the number of turbines to 100 and the IDF to 944.07 ha, to avoid areas that may support significant biodiversity or heritage values. Fauna habitat exclusion zones (see Figure 8-12) have also been incorporated around critical fauna habitats, with a commitment of minimal disturbance¹⁰. Consequently, the IDF for the Proposal is less than half that of the originally proposed design.

The following areas of biodiversity and heritage value have been avoided, where practicable, including:

- Avoidance of the drainage line/river/creek (major) habitat (except where crossing locations are required),
- Avoidance of direct disturbance of the gorges/gullies and hills/ranges/plateaux habitats, which are associated with specific fauna habitats,
- Implementation of Fauna Habitat Exclusion Zones
- Avoidance of mesas, which are associated with specific fauna habitats, and
- Avoidance of conservation significant fauna, where practicable, avoiding all existing records of conservation significant fauna.

Mitigation measures that will be implemented to avoid or minimise impacts on terrestrial fauna are summarised in Table 8-28. An EMP has been prepared to outline how the environmental impacts of the Proposal will be monitored, reported and managed for Terrestrial Fauna (Appendix B).

¹⁰ Fortescue commits to avoiding all disturbance within the proposed fauna habitat exclusion zones. The only exception is the 500 m buffer surrounding the major drainage line/river/creek habitat, where some small areas of disturbance is proposed. However, despite this allowance, no wind turbines will be placed within this buffer due to its proximity to Grey Falcon breeding habitat.



Table 8-28: Avoidance, Management and Mitigation of Impacts to Terrestrial Fauna

Impact	Management actions
Avoidance	<p>Prior to conducting ground disturbing activities, ensure known locations of environmentally sensitive areas (such as critical habitat) to be retained and protected from disturbance are identified on the ground by appropriate signage, fencing or flagging. No-go zones will be demarcated on Proposal drawings and physically on site prior to clearing activities.</p>
	<p>The Proposal has undergone substantial redesign, resulting in a major reduction in scale, including a decrease in turbine numbers from 200 to 100 and a reduction in the IDF area from approximately 2,044 ha to 944.07 ha.</p>
Minimisation	<p>Clearing and ground disturbing activities will be limited to the defined clearing limits and boundaries described within the approval documentation. The extent of the approved clearing will be clearly communicated in documentation and site inductions. Pre-clearing photos to be documented and post clearing inspections to be undertaken.</p>
	<p>All site operatives and personnel attending the site will undergo an induction regarding Threatened fauna and direct and indirect impacts (e.g., risk of vehicle strike, interaction with construction activities, waste management and introduction of feral animals).</p>
	<p>Strict speed limits will be enforced during dawn and dusk in order to avoid fauna strikes during clearing and construction (Chapter 8)</p>
	<p>Consideration will be given to the use of line marking along the 33kv electrical reticulation to increase visibility to birds and bats and improve their ability to accurately perceive depth in relation to power lines. Ultraviolet (UV) line marking, if available, should also be considered, particularly with a view to minimising risks of nocturnal collisions (Dwyer <i>et al.</i>, 2020). The design of both power lines and poles will comply with recommendations developed by BirdLife International (BirdLife International, 2007) to minimise potential for impacts to birds.</p>
	<p>Comprehensive weed hygiene management through implementation of weed management measures. All works will be undertaken in accordance with Fortescue’s Weed Management Plan (Reference: 45-PL-EN-0033) (provided in Appendix E) as the standard operating procedure.</p> <p>Implementation of fire risk management measures will be undertaken including:</p> <ul style="list-style-type: none"> • Clearing activities would not be undertaken when fire danger ratings are extreme or above, • Where increased risk of fire is identified, fire-resistant barriers like screens will be employed to confine sparks generated by welders and other hot work activities, • Carefully manage and monitor hot works through implementation of hot works permit system, • Ensuring appropriate disposal of potential fire-starting waste, e.g., cigarette butts to minimise the risk of bushfires as a result of the Proposal, and • Firefighting equipment will be located around the site and in vehicles. Fire response procedures and personnel training, including site inductions on fire prevention and management, will also be provided.
<p>All food waste will be regularly removed from site and disposed of at a licenced landfill facility to minimise attraction of feral animals,</p>	



Impact	Management actions
	<p>Lighting will be designed and managed in accordance with the National Light Pollution Guidelines for Wildlife (DCCEEW, 2023c). These include:</p> <ul style="list-style-type: none"> • Permanent lighting will be installed only where required, within operational areas, • Permanent and temporary lighting will be shielded to minimise light spill. This includes directional or shielded lighting, the mounting of light fittings as low as practicable, or louvered lighting on low-level bollards, • Automatic timers or photovoltaic switches, • Black-out blinds on windows in accommodation camps, and • Permanent and temporary lighting will be directed away from sensitive areas where possible such as areas of critical habitat. <hr/> <p>Standard construction noise management measures will be implemented, including:</p> <ul style="list-style-type: none"> • Machinery and vehicles are regularly serviced and operated/maintained in accordance with the manufacturer's specifications, and preferential use of modern equipment that generally operate more quietly, • Using techniques that reduce noise, such as employing hydraulic, rather than impact methods. Training workers on best practices for minimising noise, and • Plant and machinery on site will be switched off and not left idling when not in use. <hr/> <p>Operational measures to reduce potential impacts associated with collision of the wind turbines includes:</p> <ul style="list-style-type: none"> • Design and implementation of a bird and bat monitoring programme, which will record bird activity in the DE during construction and operation. This will include best practice estimation of actual mortality rates using current techniques (Korner-Nievergel <i>et al.</i> 2015). • A Bird and Bat Adaptive Management Plan (BBAMP) has been developed for the Proposal to minimise impacts to birds and bats, including collision impacts. This is provided in Appendix I and will be implemented through all stages of the Proposal to ensure adequacy of mitigation and minimise potential collision impacts for all avifauna species.
<p>Rehabilitation</p>	<p>Progressive rehabilitation of 480.81 ha (this includes 13.94 ha of areas previously cleared by other activities not related to this Proposal) after each phase of the construction activities will reduce impacts to fauna habitat over time, including potential fragmentation impacts.</p>



[This page has been left blank intentionally]



Legend

Development Envelope	Fauna Exclusion Zones
GOV Towns	Drainage Line/River/Creek (major) - 500m Buffer
Major Roads	Hills/Ranges/Plateaux - 1km Buffer
Fortescue Rail	Rocky Escarpments (Ridges/Mesa/Cliffs/Outcrops/Breakaways) - 1km Buffer
Roy Hill Rail	Drainage Line/River/Creek (major)
Turbine Locations	Hills/Ranges/Plateaux
Indicative Disturbance Footprint	Rocky Escarpments (Ridges/Mesa/Cliffs/Outcrops/Breakaways)
Approved Disturbance (Nullagine Pilot Wind Farm)	

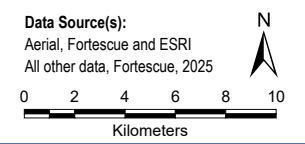


Figure 8-12
Fauna Habitat Exclusion Zones
within the Development Envelope

Requested By: R. Dorji Date: 1/29/2026
 Drawn By: R. Kerr Size: A4L
 Revised By: rykerr Revision: 0
 Approved By: Confidentiality: 0
 Scale: 1:300,000
 Coordinate System: GDA 1994 MGA Zone 50
 Project Name: 4519OP002_MP_EN_0093_PartIV_2
 Document Name: 4519OP002_MP_EN_0093_028_r0_Fauna_Excl_Zone
 Fortescue accepts no liability and gives no representation or warranty, express or implied, as to the information provided including its accuracy, completeness, merchantability or fitness for purpose.





8.7 Assessment of Impacts

8.7.1 Direct Impacts

8.7.1.1 Habitat Loss

The total clearing expected for the Proposal is 910.26 ha (excluding cleared areas), including 443.39 ha of permanent clearing and 466.86 ha of temporary clearing. A total of 480.81 ha (this includes 13.94 ha of areas previously cleared by other activities not related to this Proposal) will be rehabilitated once construction is complete. The extent of permanent and temporary clearing of fauna habitat is described in Table 8-29 and its importance for each species is presented in Table 8-30.

Table 8-29: Clearing of Fauna Habitat within the Development Envelope

Habitat	Total mapped extent in DE (ha)	Permanent clearing (ha)	Temporary clearing (ha)	Total IDF* (ha)	Proportion of impacts within DE
Drainage line/river/creek (major)	1,657.22	0.83	0.59	1.42	0.09%
Drainage line/river/creek (minor)	2,092.13	1.03	1.48	2.50	0.12%
Gorges/gullies	41.51	0.00	0.00	0.00	-
Granite outcrops (flat dome)	12.48	0.21	0.18	0.39	3.13%
Hills/ranges/plateaux	1,322.34	0.00	0.00	0.00	-
Plain (cracking clays)	5,366.12	42.68	44.51	87.19	1.62%
Plain (stony/gibber)	75,547.94	378.20	408.60	786.80	1.04%
Rocky escarpments (ridges/mesa/cliffs/outcrops / breakaways)	2,123.25	14.88	11.51	26.40	1.24%
Woodland (open)	574.28	5.56	0.00	5.56	0.97%
Woodland (closed)	392.02	0.00	0.00	0.00	-
Total	89,129.29*	443.39*	466.86*	910.26*	

* Excludes previously cleared areas

Overall, the mapped habitat areas within the IDF are proportionally small compared to the DE. Greater than 95% of each habitat type within the DE will remain after implementation of the Proposal (Table 8-29). The majority of habitats are well represented within the DE, and the Woodland (open) and (closed), Plain (stony/gibber), Rocky Escarpments (Ridges/Mesa/Cliffs/Outcrops/Breakaways), Drainage Line/River/Creek (major) and (minor) are all well represented in the surrounding region (ecologia, 2025b).

The granite outcrops (flat dome) were reported to have a restricted extent within the DE and broader region (ecologia, 2025b). Up to 0.39 ha of this habitat type will be cleared for the Proposal, which represents 3.13% of the total habitat type mapped within the DE.

When considering the above, it is expected that no fauna habitat will be significantly impacted on a local or regional scale due to the clearing associated with the Proposal.



Following completion of construction, 480.81 ha will be rehabilitated (this includes 13.94 ha of areas previously cleared by other activities not related to this Proposal), reducing the permanent clearing to 443.396 ha. This will further reduce any potential impacts on the habitat types recorded in the DE.

Conservation Significant Fauna

Potential impacts to significant fauna species, including consideration of critical and supporting habitat, are detailed in Table 8-30.



[This page has been left blank intentionally]



Table 8-30: Clearing of Threatened Fauna Habitat within the Development Envelope

Threatened and other Specially Protected Species	Habitat importance	Total mapped extent in DE (ha)	Total IDF (ha)	Proportion of impacts within mapped extent in DE (%)
Northern Quoll	Northern portion of DE - Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – critical habitat	1,302.62	14.95	1.15
	Northern portion of DE - Gorges/gullies – critical habitat	36.70	0.00	-
	Northern portion of DE - Hills/ranges/plateaux – critical habitat	1,322.34	0.00	-
	Northern portion of DE - 1 km buffer around critical habitat – critical supporting habitat	18,462.97	238.24	1.29
	Drainage line/river/creek (major) outside 1km buffer – supporting habitat	1,242.61	0.00	-
	Southern portion of DE - Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – supporting habitat	820.18	11.45	1.40
	Southern portion of DE - Gorges/gullies – supporting habitat	4.81	0.00	-
	Southern portion of DE - Granite outcrops (flat dome) – supporting habitat	12.48	0.39	3.13
	Total Northern Quoll critical habitat	2,661.66	14.95	0.56
	Total Northern Quoll critical supporting habitat	18,462.97	238.24	1.29
	Total Northern Quoll supporting habitat	2,080.08	11.84	0.57
PLNB	Hills/ranges/plateaux – critical habitat	1,322.34	0.00	-
	Gorges/gullies – critical habitat	41.51	0.00	-
	Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – critical habitat	2,123.25	26.40	1.24
	Drainage lines/river/creek (major) – critical habitat	1,657.22	1.42	0.09
	All other habitats – supporting habitat	83,984.97	882.44	1.05
	Total PLNB critical habitat	5,144.32	27.82	0.54
	Total PLNB supporting habitat	83,984.97	882.44	1.05
Grey Falcon	Drainage line/river/creek (major) – critical habitat	1,657.22	1.42	0.09



Threatened and other Specially Protected Species	Habitat importance	Total mapped extent in DE (ha)	Total IDF (ha)	Proportion of impacts within mapped extent in DE (%)
	All other habitat - supporting habitat	87,472.07	908.83	1.04
	Total Grey Falcon critical habitat	1,657.22	1.42	0.09
	Total Grey Falcon supporting habitat	87,472.07	908.83	1.04
Pilbara Olive Python	Hills/ranges/plateaux – critical habitat	1,322.34	0.00	-
	Gorges/gullies – critical habitat	41.51	0.00	-
	Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – critical habitat	2,123.25	26.40	1.24
	Drainage lines/river/creek (major) – critical habitat	1,657.22	1.42	0.09
	Total Pilbara Olive Python critical habitat	5,144.32	27.82	0.54
Ghost Bat	Hills/ranges/plateaux – critical habitat	1,322.34	0.00	-
	Gorges/gullies – critical habitat	41.51	0.00	-
	Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – critical habitat	2,123.25	26.40	1.24
	Drainage lines/river/creek (major) – critical habitat	1,657.22	1.42	0.09
	All other habitats – supporting habitat	83,984.97	882.44	1.05
	Total Ghost Bat critical habitat	5,144.32	27.82	0.54
	Total Ghost Bat supporting habitat	83,984.97	882.44	1.05
Night Parrot	Patches of long unburnt vegetation with <i>Triodia longiceps</i> – critical habitat*	4,882.01	11.45	0.23
	Patches of long unburnt plain (stony/gibber) – critical habitat	17,941.43	270.36	1.51
	Plain (cracking clays) – supporting habitat	5,366.12	87.19	1.62
	Total Night Parrot critical habitat	22,823.44	281.81	1.23
	Total Night Parrot supporting habitat	5,366.12	87.19	1.62
	Drainage lines/rivers/creeks (major) – supporting habitat	1,657.22	1.42	0.09



Threatened and other Specially Protected Species		Habitat importance	Total mapped extent in DE (ha)	Total IDF (ha)	Proportion of impacts within mapped extent in DE (%)
Australian Snipe	Painted	Total Australian Painted Snipe supporting habitat	1,657.22	1.42	0.09
Peregrine (other protected)	Falcon specially	Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – critical habitat	2,123.25	26.40	1.24
		Drainage lines/rivers/creeks (major) – critical habitat	1,657.22	1.42	0.09
		All other habitats – supporting habitat	85,348.82	882.44	1.03
		Total Peregrine Falcon critical habitat	3,780.47	27.82	0.74
		Total Peregrine Falcon supporting habitat	85,348.82	882.44	1.03

*ecologia (2025b) derived the areas from vegetation mapping of the flora survey, occurring on multiple fauna habitat types.



[This page has been left blank intentionally]



Northern Quoll

During the field surveys, the Northern Quoll was recorded on 229 occasions within the DE. The Northern Quoll was recorded in the drainage line/river/creek (major) and rocky escarpment (ridges/mesa/cliffs/outcrops/breakaways) habitats (ecologia, 2025b). As discussed, based on the number of individuals identified (at least 17 individuals deduced from spot analysis and trapping, and frequency of detections (219 independent motion camera visits) during field surveys, the northern half of the DE appears to support a high density, reproductive population of Northern Quolls (ecologia, 2025b).

Clearing up to 11.84 ha of supporting habitat in the southern section of the DE for the Northern Quoll represents only 0.57% of the total mapped extent of this habitat and is therefore not expected to result in a significant impact to this species.

However, the clearing of up to 253.19 ha of critical habitat and critical supporting habitat in the northern section represents 1.20%% of the mapped extent within the DE. As this is critical habitat for the Northern Quoll and the species was recorded within the DE in relatively high abundance, the clearing of up to 14.95 ha of critical habitat (of which 8.09 ha is permanent clearing and 6.86 ha is temporary clearing), and 238.24 ha of critical supporting habitat, is considered a significant impact.

PLNB and Ghost Bat

The majority of the PLNB calls were recorded within the drainage line/river/creek (major) habitat and adjacent to water sources (mostly dams) during wet season (ecologia, 2025b). There were no low-time calls (calls within 20 minutes of sunset or sunrise) indicative of a nearby potential roost site during current or previous surveys (ecologia, 2025b).

Similarly, the Ghost Bat was recorded on motion camera within the drainage line/river/creek (major) habitat in the northern extent of the DE (ecologia, 2025b and ecologia, 2026), which represents critical habitat for these species.. The rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) also provide critical habitat for the PLNB and Ghost Bat. Clearing of up to 27.82 ha of critical roosting and foraging habitat (Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) and drainage lines/river/creek (major)) for the Ghost Bat and PLNB represents 0.54% of the mapped extent of critical habitat within the DE. No suitable roost caves were identified within the DE and no call times indicate a nearby roost site despite extensive survey effort over multiple seasons (ecologia, 2025b). While the PLNB and Ghost Bat are currently unlikely to roost in the DE, clearing of potential roosting habitat has the potential to limit the ability of the species to inhabit the area should other habitats surrounding the DE become unsuitable. As such, clearing of critical habitat represents a potentially significant impact.

Clearing of up to 882.44 ha of supporting habitat (all other habitat types) for the Ghost Bat and PLNB represents 1.05% of the mapped extent within the DE. Clearing of this supporting habitat for the Ghost Bat and PLNB is not considered to have a significant impact on the species due to the abundance of habitat remaining in the DE and wider area, as detailed in Table 8-30. Impacts related to collision risk for these species is discussed in Section 8.7.1.2.

Grey Falcon

The Grey Falcon was recorded in the DE on nine occasions during the recent field surveys (ecologia, 2025b and ecologia, 2026). There were observations in the drainage line/river/creek



(major and minor), woodland (open) plain (stony/gibber) and cleared habitats (ecologia, 2025b; ecologia, 2026).

Clearing of 1.42 ha of critical habitat for the Grey Falcon represents 0.09% of its mapped extent within the DE. Clearing up to 908.83 ha of supporting habitat for this species (all other habitat types) represents 1.04% of the habitat's mapped extent within the DE. Clearing of critical and supporting habitat for the Grey Falcon is not considered to be a significant impact as trees containing active nests for the Grey Falcon will not be cleared, and remaining habitat in the DE and wider area will not be impacted as detailed in Table 8-30. Impacts related to collision risk for this species are discussed in Section 8.7.1.2.

Pilbara Olive Python

The species was recorded once in the DE within the plain (stony/gibber) habitat; once within the Survey Area (approximately 7 km from the DE) and once inside the DE (ecologia, 2025b).

Clearing of 27.82 ha of Pilbara Olive Python critical habitat represents 0.54% of the mapped extent of these habitat types within the DE. As the clearing extent equates to less than 1% of the available critical habitat within the DE and there is further suitable habitat in the wider area, this is not considered a significant impact to the species.

Night Parrot

Targeted Night Parrot surveys were undertaken as a part of the ecologia (2025b) survey using acoustic monitoring. Night Parrot calls were not recorded during recent surveys, and it is considered unlikely that a long-term stable Night Parrot roost exists in the areas immediately surrounding the points sampled. It is also considered unlikely that Night Parrots were foraging in proximity to these surveyed points at the time of sampling (ecologia, 2025b).

Clearing of 281.81 ha of Night Parrot critical habitat represents 1.23% of the mapped extent of these habitats within the DE. Clearing of 87.19 ha of Night Parrot supporting habitat represents 1.62% of the mapped extent of these habitat types within the DE. Clearing of these habitats is not anticipated to have a significant impact on the species due to the lack of records of this species in the area and the abundance of remaining suitable habitat within the DE, as well as the surrounding area (Table 8-30). Additionally, clearing for the Proposal is predominantly linear and if a population of Night Parrots were to utilise the DE, they could make use of habitat adjacent to the IDF. The collision risk for this species is detailed in Section 8.7.1.2.

Australian Painted Snipe

This species was not recorded during recent field surveys (ecologia, 2025b). Clearing of 1.42 ha of supporting habitat (Drainage lines/rivers/creeks (major)) for the Australian Painted Snipe represents 0.09% of the mapped extent of this habitat within the DE. Clearing of this supporting habitat is not considered a significant impact on this species due to abundance of this habitat in the DE and wider area, lack of records of this species within the DE and the presence of more suitable habitat within the Fortescue Marsh 9.3 km from the DE. The risk of collision for this species is detailed in Section 8.7.1.2.

Peregrine Falcon



This species was not recorded during recent field surveys (ecologia, 2025b). The Peregrine Falcon is listed as 'other specially protected species'. Clearing up to 27.82 ha of critical habitat for this species represents 0.74% of the mapped extent within the DE. Clearing up to 882.44 ha of supporting habitat (all other habitat types) for this species represents 1.03% of the mapped extent within the DE. Given the habitat remaining in the DE and wider area, this clearing is not considered to result in a significant impact to this species. The risk of collision for this species is detailed in Section 8.7.1.2.

Priority Fauna

Five Priority fauna species have been recorded from within the DE or have a high likelihood of occurrence, as detailed in Section 8.4.1. Given these are all ground dwelling species of marsupials, reptile or rodent, the primary impacts from the Proposal relating to these species will be associated with clearing of supporting habitat within the DE. The relevant Priority species and their associated supporting habitat are reported in Table 8-31 with details of the proportionate impact to each species habitat. There was no critical habitat in the DE for any of the five Priority fauna species (ecologia, 2025b)). Impacts related to collision risk for these species is discussed in Section 8.7.1.2.



[This page has been left blank intentionally]



Table 8-31: Clearing of Priority Fauna Supporting Habitat within the Development Envelope

Species	Habitat importance	Total mapped extent in DE (ha)	Total (ha)	IDF	Proportion of impacts within mapped extent in DE
Gane's Blind Snake	Hills/ranges/plateaux	1,322.34	0.00	-	
	Plain (stony/gibber)	75,547.94	786.80	1.04%	
	Gorges/gullies	41.51	0.00	-	
	Drainage line/river/creek (major)	1,657.22	1.42	0.09%	
	Total Gane's Blind Snake (supporting) habitat	78,569.01	788.22	1%	
Brush-tailed Mulgara	Plain (stony/gibber)	75,547.94	786.80	1.04%	
	Total Brush-tailed Mulgara (supporting) habitat	75,547.94	786.80	1.04%	
Short-tailed Mouse	Plain (cracking/clays)	5,366.12	87.19	1.62%	
	Drainage lines/rivers/creeks (minor)	2,092.13	2.50	0.12%	
	Total Short-tailed Mouse (supporting) habitat	7,458.25	89.69	1.20%	
Western Pebble-mound Mouse	Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways)	2,123.25	26.40	1.24%	
	Hills/ranges/plateaux	1,322.34	0.00	-	
	Plain (stony/gibber)	75,547.94	786.80	1.04%	
	Total Western Pebble-mound Mouse (supporting) habitat	78,993.53	813.20	1.03%	
Long-tailed Dunnart	Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways)	2,123.25	26.40	1.24%	
	Gorges/gullies	41.51	0.00	-	
	Granite outcrops (flat dome)	12.48	0.39	3.13%	
	Hills/ranges/plateaux	1,322.34	0.00	-	
	Total Long-tailed Dunnart (supporting) habitat	3,499.58	26.79	0.77%	



[This page has been left blank intentionally]



As detailed in Table 8-31, S greater than 98% of the mapped extent of supporting habitat within the DE for each Priority fauna species o will remain. Further, following construction, 480.81 ha will be rehabilitated (this includes 13.94 ha of areas previously cleared by other activities not related to this Proposal). In addition, the Priority fauna supporting habitat types recorded are part of much larger units extending beyond the DE. This is with the exception of the granite outcrops (flat dome) habitat type used by the Long-tailed Dunnart, which was reported to have a restricted extent within the DE and broader region (ecologia, 2025b). Up to 0.39 ha of this habitat type will be cleared, representing 3.13% of the total habitat type mapped within the DE. Therefore, clearing of habitats as detailed in Table 8-31 will be negligible in relation to the full extent of these habitats in the surrounding area.

Migratory Species

The Fork-tailed Swift was recorded on four occasions during the wet season survey conducted in February 2025 and Oriental Plover was recorded on a single occasion during the southward migration in September 2024 (ecologia, 2025c). No supporting or critical habitat for the Fork-tailed Swift is considered to occur in the DE as the species does not utilise terrestrial habitats; however, may utilise the airspace above the study area while transiting (ecologia, 2025b). All habitat types mapped within the DE (89,129.29 ha) are considered supporting habitat for the Oriental Plover, of which 910.26 ha is to be cleared within the IDF.

An additional nine migratory species were classified as 'Moderate' likelihood of occurrence, as detailed in Section 8.4.1.2. Suitable supporting habitat within the DE for these species is limited to 1,657.22 ha of drainage lines/rivers/creeks (major) habitat , of which up to 1.42 ha will be cleared in the IDF (representing 0.09% of this habitat type within the DE). Given the aerial nature of the Migratory species and the more suitable habitat (Fortescue Marsh nature reserve) within 9.3 km of the DE, the removal of suitable supporting foraging and dispersal habitat from the Proposal will result in negligible impacts to these species. Impacts to these Migratory species in relation to direct collisions with wind turbines is discussed in Section 8.7.1.2.

Short-Range Endemic Invertebrates

As detailed in Section 8.4.6, there is no significant association between specific habitat and numbers of SRE species. None of the four habitat categories sampled in the survey had a significant number of SRE target groups (HBI, 2024).

With respect to conservation significant species, the keeled millipede *Antichiropus sloanae* is a confirmed SRE that was collected in the DE during the SRE field survey, but it is also known from records outside of the DE. It is listed as Priority 1 under Western Australian conservation legislation. This species was recorded at three sites within the DE, one in the central northern portion of the DE and two close to the south eastern boundary (as shown in Figure 8-11), none of the sites were within the IDF. Given *Antichiropus sloanae* is known from outside of the DE and the relatively small amount of clearing proposed compared to the wider DE, a significant impact on this species is not anticipated.

8.7.1.2 Bird and Bat Collision with the Operational Wind Farm Infrastructure

The presence of wind turbines is a potential risk for bird and bat collisions during operational activities. This risk is mainly due to rotating wind turbine blades; however, collisions with turbine towers and motionless blades can also occur, especially among birds. A review of existing literature in relation to bat impacts of wind farms has been undertaken and is presented in Appendix J.



A study of existing collision risk models (CRM) has been undertaken for the Proposal (HBI, 2026a). Utilising the BBSUS conducted for the Proposal and the Australian Database for Birds (BirdLife Australia, 2025). Two CRM models were run including the widely used Band model (Band *et al.*, 2007), and a New Model that was developed as part of the ongoing research for the Proposal. There are some limitations with the Band model approach as the method used to determine interactions with the rotor swept area (RSA makes approximations that overestimate the number of interactions with Wind Turbine Generators (WTG) (HBI, 2026a) because it assumes an extended two-dimensional plane in which the WTGs are situated. The New Model is designed to be more flexible, allowing increasing levels of site-specific information to be incorporated as more data is obtained, and uses a 3-dimensional approach to predict bird location and WTG interaction.

Simulations were run for species observed within the area flying at heights that would be within the rotor sweep area (RSA) of the proposed wind turbines. Where possible, data from the two Robin Radar MAX units on site was analysed and prepared for use in the simulation models. Results from the two models (Band Option 2 with 99.5% avoidance, New Model with 90% avoidance) were consistent and identified the same bird species at risk at similar levels. This report has been provided in Appendix K and the results are discussed below. It should be noted that the results of the CRM discussed below include both the Proposal and the combined impact from the nearby Nullagine Pilot Wind Farm currently under development (within the DE) as a worst-case conservative assessment. An analysis of the combined risk to birds via collision with the WTG from both the Proposal and the Nullagine Pilot Windfarm (total of 117 turbines) was performed.

Potential Collision Impacts on Avifauna and Bats

The majority of the 128 bird and bat taxa recorded in the Survey Area during the ecologia (2025b) and ecologia (2026) surveys were not listed as Threatened under the BC Act or as Priority fauna by DBCA and are typically low-flying and/or canopy-dwelling species which are unlikely to be at risk of collision with turbines (ecologia, 2026). At-risk species recorded during the BBSUS (ecologia 2026) were predominantly raptors (15 species) and waterbirds (26 species). These species belong to groups considered to be at greater risk of turbine collision due to flight demographics and behavioural attributes.

One Threatened (the Grey Falcon) and two migratory (Fort-tailed Swift and Oriental Plover) bird species were recorded within the DE (ecologia, 2025b and 2026). Additionally, the following species were considered post-survey as 'High' or 'Moderate' likelihood of occurrence: Night Parrot, Australian Painted Snipe, Common Greenshank, Peregrine Falcon and eight Migratory species (ecologia, 2025b).

CRM simulations (HBI, 2026a) were run for the 13 species that were observed in the DE, flying at heights that would be within the rotor sweep area (RSA) of the proposed WTGs. This includes the conservation listed species, the Grey Falcon. Where sufficient flight height data was not available for a particular species to accurately include within the RSA of CRM, expert elicitation on collision risk has been used from Reid and Baker (2025) as the proposed WTGs most appropriate current literature. It should be noted that the collision risk estimates presented in the CRM (HBI, 2026a) represent inherent (unmitigated) collision risk and do not account for the potential reduction achievable through management and design measures that may be adopted during project development or operations (e.g., curtailment, deterrent/monitoring systems, or blade marking/painting). The CRM results are presented in Appendix K.



Threatened Fauna

Four Threatened bird species and one specially protected bird species have medium to high likelihood of being present within the DE (ecologia, 2026).

With regard to the Grey Falcon species recorded during the survey, the species is likely to predominantly use the DE for foraging across all habitats, with potentially nesting associated with the major drainage line/river/creek (major) habitat. Flight heights recorded during incidental observations in the ecologia (2026) survey range from 0 m (ground level) to 235 m, with seven observations involving birds flying within the proposed RSA height (ecologia, 2026). Of the existing Pilbara records and sightings from the BBSUS for the Proposal, about one third identified the flight height as being sufficient to place the bird in the RSA. Both models rated the Grey Falcon of being in danger of losing less than 2% of the modelled local population each year due to collision with the WTG. This is a relatively low value (estimated 1 bird collision every ~12 years for the adult population of ~2 pairs), which would mean the population would maintain sustainable levels.

Although the Grey Falcon species may overfly all habitat types during dispersing and foraging activities, hunting and breeding activities primarily occur within the Drainage Line/River/Creek habitat types. Many of the grey falcon sightings have been recorded within creek lines and rivers or adjacent habitat, with the Bonnie Creek, Nullagine River, Coongan River and associated tributaries providing movement corridors for the species within the survey area (ecologia, 2026). Therefore, with the substantially reduced number of turbines proposed compared to the original design, and incorporation of fauna habitat avoidance areas around the majority of Drainage Line/River/Creek habitat types, potential interaction with the WTG has been minimised.

The Night Parrot was not recorded in the DE, and there is no flight height data for this or closely related species from which to carry out CRM. These birds usually stay just above vegetation, flying low and fast when flushed, often in zigzag patterns, but have been recorded covering significant distances (18-41 km in a night) (Murphy *et al.*, 2017) between roosting/feeding sites. There is only 1 record of the species in the Pilbara (ALA, 2025) and none within the DE recorded as part of BBSUS (ecologia, 2026) with limited preferred habitat within the DE. Reid and Baker (2025) classed this species as likely to have a low chance of flying within RSA height (class 2, noting that class 1 was attributed to flightless and resident obligate ground foraging birds). Therefore based on these expert assessments within the available literature, the species would have low likelihood of turbine collision.

For the Peregrine Falcon, there are 120 records of the species in the Pilbara (ALA, 2025), but none have been recorded in the DE as part of BBSUS (ecologia, 2025b; ecologica, 2026). Consequently, without flight height data, CRM could not be carried out for this species. Reid and Baker (2025) attributed the highest risk profile flight height (class 5) and second-highest categorisation (class 4) for amount of time spent in flight for this species, with a high overall turbine risk categorisation. However, this assessment estimated threat of collision for an RSA between 30 to 275 m whilst the Proposal WTGs have a much higher RSA (>100m). In order to mitigate any potential collision impacts to the species, a Bird and Bat Adaptive Management Plan (BBAMP) has been developed (provided in Appendix I) and is discussed further in the following section.

The Australian Painted Snipe is listed as Endangered under the BC Act. The Common Greenshank and Sharp-tailed Sandpiper are designated as both Threatened and Migratory species. Neither of these species have been recorded within the DE during the BBSUS



(ecologia, 2025b; ecologica, 2026) and therefore could not be modelled due to lack of height data. Reid and Baker (2025) attributed a high overall turbine risk categorisation for the Australian Painted Snipe, however this assessment estimated threat of collision for an RSA between 30 to 275 m whilst the Proposal WTGs have a much higher RSA (>100m). The mitigation measures detailed in the BBAMP and summarised in the following section will minimise potential collision risk such that no significant impacts on this species are anticipated. The Common Greenshank and Sharp-tailed Sandpiper are discussed further in the Migratory Species section below.

Migratory Species

Eleven Migratory bird species were either recorded (Fork-tailed Swift and Oriental Plover) or have moderate likelihood of being present within the DE (ecologia, 2026).

The Migratory species recorded during the BBSUS surveys typically fly at heights significantly higher than the RSA for the Proposal during migration, with typical flight heights reported between 1,000-5,000 m (Geering *et al.*, 2007). As these species are likely utilising the DE as dispersal (overfly) habitat when travelling to the Fortescue Marsh (ecologia, 2025b), flight heights would likely be higher than the RSA during these activities. However, these Migratory species were also reported to potentially forage within the drainage lines/creeks/rivers (major) habitat, with flight heights much closer to ground level. Fork-tailed Swift was observed flying below the RSA on all four recording occasions, while the Oriental Plover was recorded on a single occasion, also flying well below the RSA (ecologia, 2026).

Birds, especially Migratory species, use thermals to gain elevation from lower altitudes without expending too much energy, especially during long flights or while searching for food. The Pilbara's arid environment, with its varied topography and vegetation, provides suitable conditions for the formation of thermals, which birds use for elevation. Therefore, where individuals of Migratory species are engaging in thermal soaring activity and gaining altitude from the lower elevations recorded, they would be at a heightened risk of collision with the operation turbines and as such, a residual risk of bird mortalities from collision remains.

There was a single record of Oriental plover and therefore insufficient data to carry out CRM for this species. Although this species has been attributed by Reid and Baker (2025) 'class 2' for flight height (noting that class 1 was attributed to flightless and resident obligate ground foraging birds), the Oriental Plover has been given a score of class 4 for flight time, in recognition of its migration behaviour, with an overall risk categorisation of medium. However, this assessment estimated threat of collision for an RSA between 30 to 275 m whilst the Proposal WTGs have a much higher RSA (>100m).

Population estimates for the Fork-tailed Swift are unknown; however, populations are believed to be stable throughout most of its range, except in Pakistan (del Hoyo *et al.* 1996). There are currently no measures of abundance in Australia (DoE, 2024a), however this species has commonly been observed during previous surveys commissioned by Fortescue in the region, with over 700 individuals observed at 31 locations recorded in Fortescue's survey database. CRM for Fork-tailed Swift has not been carried out as this species was not observed within the RSA. Reid and Baker (2025) attributed the highest risk profile flight height and amount of time spent in flight for this species, with a high overall turbine risk categorisation for this species. However, this assessment estimated threat of collision for an RSA between 30 to 275 m whilst the Proposal WTGs have a much higher RSA (>100m). Although this species was recorded on four occasions within the DE, it was observed flying below the RSA on all



occasions (ecologia, 2026), however an inherent risk of bird mortalities associated with the Proposal remains.

In order to mitigate any potential collision impacts to the species, a Bird and Bat Adaptive Management Plan (BBAMP) has been developed (provided in Appendix I). The BBAMP outlines specific mitigation measures designed to reduce the risk of significant impacts on bird and bat species from implementation of the Proposal. Additional measures may be implemented following the investigation of triggers being reached or exceeded and the BBAMP reviewed. Measures may include, but are not limited to, those currently being investigated by Fortescue through trials at the Nullagine Pilot Wind Farm and via research projects in collaboration with the HBI. The ongoing, preventative mitigation measures include visual and acoustic deterrents (e.g. painted turbine blades); curtailment protocols (e.g. blade feathering, radar or camera based smart curtailment); lighting controls; and carrion removal.

A carcass search programme will be implemented to monitor the frequency of bird and bat mortality due to collision or barotrauma associated with the Proposal from which the total number of mortalities can be estimated. This will be used to assess the accuracy of mortalities/featherspots/injured individuals recorded by the carcass search program and inform appropriate responses or extension of the program's implementation. Through ongoing monitoring of impact trigger levels detailed in the BBAMP (Appendix I), and implementation of adaptive management, significant impacts to this species are not anticipated.

The remaining nine migratory waterbirds were not recorded during the BBSUS (ecologia, 2025b and 2026), and have a moderate likelihood of occurrence in the DE. Reid and Baker (2025) outlines the following overall turbine risk categories:

- Common Greenshank - High
- Caspian tern – High;
- Sharp-tailed sandpiper – High;
- Gull-billed tern – High;
- Glossy ibis – High;
- Common sandpiper – Medium;
- Red-necked stint – Medium; and
- Wood sandpiper – Medium.
- Marsh sandpiper was not assigned an overall risk category and therefore no Reid & Baker (2025) overall risk category is available for this species.

However, this assessment estimated threat of collision for an RSA between 30 to 275 m whilst the Proposal WTGs have a much higher RSA (>100m). Therefore, the lower bound of the rotor-swept area is substantially higher than the minimum rotor heights assumed, which means the proportion of flights occurring within the rotor-risk height band could be lower for some wetland-associated species if their local movements are predominantly at low altitude (NatureScot 2025).



Given that these species (other than Fork-tailed Swift and Oriental Plover) were not recorded in the BBSUS (ecologia, 2025b, 2026), all of these species are expected to potentially overfly and/or forage at a relatively low abundance. Estimates of the East Asian Flyway population have been outlined below to show that the expected small number of individuals utilising the DE is not anticipated to be significant at a population level. The total estimated East Asian Flyway population of the relevant Migratory species are (Hansen *et al.*, 2016):

- 110,000 birds – Common Greenshank,
- 190,000 birds – Common Sandpiper,
- 85,000 birds – Sharp-tailed Sandpiper,
- 475,000 birds – Red-necked Stint,
- 230,000 birds – Oriental Plover,
- 130,000 birds – Wood Sandpiper, and
- 130,000 birds – Marsh Sandpiper.

The estimated East Asian Flyway population is not provided for three species: the Gull-billed Tern, Caspian Tern and Glossy Ibis. The global population of the Gull-billed Tern has not been estimated separately, however, the estimated combined population of the Gull-billed Tern and Australian Gull-billed Tern is between 150,000 to 420,000 individuals (Delany & Scott, 2006). The total population of the Caspian Tern is estimated to be between 240,000 and 420,000 individuals (BirdLife International, 2010). The Glossy Ibis has an estimated population size between 1,200,000 and 3,200,000 individuals worldwide (BirdLife International, 2010). Given the relative abundance of these species at a population level, the small number likely to occur in the DE (based on the survey effort) would not represent a substantial portion of the wider population. Therefore, any potential impacts to these species from collision are not anticipated to be significant at a regional or population level.

Any potential impacts will be minimised as far as practical through the implementation of mitigation measures outlined in Section 8.6 and the BBAMP (Appendix I).

Non-conservation Significant Avifauna

The BBSUS (ecologia, 2025b and 2026) also recorded non-conservation significant avifauna movements and considered potential impacts to these species from operation of the Proposal. Flight height analysis was undertaken for systematic raptor and waterbird observations recorded during set-time surveys. The majority of flights (58.16%) recorded during set-time surveys were undertaken at heights below 60m, 15.41% of flights were undertaken at heights between 60-80 m and 9.72% of flights were undertaken at heights between 80-100m (Table 16). Only 8.17% of flights recorded during set-time surveys were undertaken at heights of greater than 100 m, and therefore with potential to interact with the RSA.

The little black cormorant and white-necked heron were the only waterbirds recorded flying at heights greater than 100 m during the set-time surveys, with the pacific black duck, black-fronted dotterel, white-faced heron and little pied cormorant recorded flying at heights of up to 100m. Four additional species of raptor were recorded flying at heights greater than 100 m during set-time surveys: the brown falcon, spotted harrier, wedge-tailed eagle and the



whistling kite. These species belong to groups considered to be at greater risk of turbine collision due to flight demographics and behavioural attributes.

CRM was run for 12 non-conservation significant avifaunal species where there was sufficient data available. The species with highest collision risk was identified as the Wedge-tailed eagle (11.67% for the Band Option 2 model with 99.5% avoidance rate, and 4.47% for the New Model with 90% avoidance rate). This raptor was commonly recorded at the site. This species also had the most BBSUS and radar records, and so the modelling estimates for flight height were most reliable. Straw-necked ibis (7.0%, 2.75%), Australian pelican (2.77%, 5.25%), Little black cormorant (2.04%, 1.35%) and Masked woodswallow (2.19%, 1.55%) were estimated as next in terms of collision likelihood. All other species were computed to have relatively low collision risk, with estimates <2% for both models.

Any potential impacts will be minimised as far as practical through the implementation of mitigation measures outlined in Section 8.6 and the BBAMP (Appendix I).

Potential Bat Collision Impacts with Proposal Wind Turbines

At least twelve bat taxa have been recorded within the survey area (ecologia, 2025b; 2026), including echolocation calls belonging to at least 10 bat species during the BBSUS (ecologia, 2026). Two of these species are conservation significant (Ghost bat and PLNB). Available published data on bat mortalities at Australian wind farms represents species bias, as operational wind farms are principally in NSW and Victoria; consequently, there is no evidence of collision fatalities for 4 of the 10 microbat species recorded at the DE, as their geographic range does not currently overlap with operational wind farms (HBI, 2026b). For example, there are no turbine collisions records for PLNB. Furthermore, although Ghost bat range does overlap with wind farms in northern Queensland, there are also no available records of collision fatalities (HBI, 2026b).

As part of the research undertaken for the Proposal, HBI (2026b) reviewed four traits-based protocols for predicting bat wind turbine collisions and compared these with the predictions for the 10 bat species present at Bonney Downs. This report is provided in Appendix J. The fatality threat categories provided in their international review by Voigt et al. (2024) are generally most conservative (8/10 species classed as having high risk of turbine collision). In their Australia-wide categorisation, Reid and Baker (2025) classed four species as having High risk of turbine collision, while Specialised Zoological (2025) identified only two species as having high risk of turbine collision for their categorisation tailored specifically to the Proposal.

PLNB is categorised as low risk of wind turbine collision based on its foraging style (unlikely to fly higher than 50 m) and small number of records close to the DE (Specialised Zoological 2024, 2025). Reid and Baker (2025) classed the species as high overall impact of wind turbines, largely due to scores attributed to the species' habitat specialisation and population status (VU). However, the same authors attributed low risk scores for flight height and flight mobility score. Ecological (foraging strategy) and biological (wing morphology) information indicates that this species forages close to the ground near vegetation and is unlikely to fly into the RSA. Expert elicitation for the Bonney Downs study site similarly classifies this species as having low likelihood of flying above 50 m (Specialised Zoological, 2024), therefore anticipated to be well outside the RSA. No roost structures have been recorded in the DE, and based on call data, no roosts appear likely to occur. Occurrence within the DE is therefore considered low, with only infrequent foraging activity recorded. Coupled with low activity records, the species is overall classed as low risk of wind turbine collision (Specialised



Zoological, 2025). HBI (2026b) have undertaken a review of the available literature and concluded the species is at low risk of collision.

Similarly, the Ghost Bat as having a low collision risk but High overall impact of wind turbines, largely due to scores attributed for population vulnerability (conservation rating) and foraging habitat selectivity (these bats require trees for their sit-and-wait hunting) (Reid and Baker 2025). The same authors also gave the species a relatively high risk score for flight mobility; this scoring could reflect the large size of the bat, but wing morphology data indicates high manoeuvrability for the species (Norberg & Fenton 1988, Crane et al., 2022). Reid and Baker (2025) attributed Low risk scores for flight height (i.e., collision risk), which is consistent with available data derived from GPS tracking for the species (Trainer et al., 2025). Expert elicitation for the DE classifies this species has having medium likelihood of flying above 50 m (Specialised Zoological, 2024), also supporting GPS tracking results for the species (Trainer et al., 2025). No roost structures have been recorded in the DE, and based on call data, no roosts appear likely to occur. Occurrence within the DE is considered low, with a single observation recorded during BBSUS. Ecological and biological information indicates that this species hunts prey using an ambush strategy, with good visual perception, which would limit it flying within the RSA and should enable good perception of turbine blades. HBI (2026b) also consider, based on their review of the available literature, that the species is at low risk of collision.

Despite these low inherent collision risk classifications for these bat species, mitigation has been outlined within the BBAMP to ensure this risk assessment is accurate and a negligible potential for impacts remain. These measures include visual and acoustic deterrents; curtailment protocols; lighting controls; carrion removal; and a carcass search programme.

8.7.1.3 Increased Risk of Vehicle Strike

During the construction phase, vehicle movements will increase throughout the DE associated with the transit of personnel, increasing the risk of vehicle strikes within the area. This risk will be reduced during the operational phase, though a camp of up to 100 personnel will be established for maintenance and operational activities. In addition, there is risk of mortality caused by heavy plant and machinery during clearing activities (for example collision with dozers as they clear).

The risk of vehicle strike will remain throughout the construction phase and this impact would be similar for all diurnal species likely to occur in the DE (some of the Threatened and Migratory species discussed in this report). However, for those that are predominantly nocturnal, including the Night Parrot, Northern Quoll, PLNB, Ghost Bat, and most of the Priority fauna considered, there would be a relatively lower risk of collision with construction or operational vehicles given the anticipated substantial reduction in site activity during the night when these species are most active.

Collision with vehicles could lead to injury or mortality of fauna species. However, with implementation of the standard mitigation measures as outlined in Section 8.6, the anticipated collision numbers would be low. Therefore, the potential collision impacts are not considered to be significant for any of the species identified.



8.7.2 Indirect Impacts

8.7.2.1 Habitat degradation from indirect impacts on vegetation health

The proposal has the potential to result in indirect impacts to native vegetation within and in close proximity to the IDF. Indirect impacts may arise through changes to environmental processes such as altered surface water or groundwater regimes, dust deposition, soil disturbance, weed introduction, and increased edge effects. These mechanisms may place chronic stress on retained vegetation, leading to a gradual decline in vegetation health and condition over time. A reduction in vegetation condition can cause habitat degradation through loss of structural complexity and ecological function, including reduced availability of foraging, shelter, and breeding resources for fauna. Accordingly, indirect impacts to vegetation health require consideration in assessing the significance of impacts to terrestrial fauna values.

As discussed in Section 7.7.2, indirect impacts on vegetation as a result of the Proposal are not anticipated to be significant for any of the environmental values assessed and therefore no significant impacts on vegetation health will occur. As such, the potential for habitat degradation as a result of changes in vegetation health is considered to be negligible. Potential for indirect impacts on fauna and fauna habitat are discussed in further detail in Sections 8.7.2.2 to 8.7.2.8.

8.7.2.2 Habitat Fragmentation and Proposal Infrastructure Acting as a Barrier to Fauna Movement

Many species in the Pilbara are adapted to specific habitats, the clearing of which can threaten their survival. Habitat fragmentation may occur due to permanent clearing associated with the Proposal, specifically with relation to the development of new roads and access tracks within the IDF. The Proposal, including wind turbine locations, also poses a potential impact on loss of fauna habitat and fragmentation through the creation of a physical barrier (Dai *et al.*, 2015) and the associated avoidance behaviour of some species. This is especially the case for birds and bats, which avoid flying between blades, but also non-flying wildlife, which may forage or transit within the habitat between the infrastructure (Barre *et al.*, 2018, Marques *et al.*, 2019).

Clearing of habitat for the Proposal may cause barriers to fauna movement for the Threatened and Priority Species likely to occur in the DE, particularly those species with lower mobility such as small mammals like the Western Pebble-mound Mouse, Long-tailed Dunnart and the Northern Short-tailed Mouse. This can cause individuals in a population to become isolated from one another or prevent individuals from moving from their nesting or denning habitat to areas where they may forage. However, given the majority of the DE will remain undisturbed; the access roads are proposed to be up to 8 m wide; the turbine structures will be widely spaced with up to 2 km between each turbine and a minimum of 600 m, and the electrical reticulation will not prevent the movement of fauna underneath, it is likely that clearing for the Proposal and the placement of infrastructure will not cause a barrier to species movement within their home ranges. In addition, large areas of undisturbed habitat will remain intact within the DE and surrounding area post-disturbance and populations in these areas will not be impacted.

For the Migratory bird species likely to occur in the DE, fragmentation is generally not considered to be a significant issue given they can easily traverse from one area to another, unless the clearing creates a sufficient barrier that they cannot fly over. As discussed above, the proposed clearing will be dispersed over a large area and will be relatively narrow associated primarily with the access roads and turbine pads, and is therefore not anticipated



to result in significant fragmentation impacts or act as a substantial barrier for these species (collision impact has been discussed in Section 8.7.1.2).

Through an iterative assessment process and implementation of the mitigation hierarchy, the design has been refined to half the number of turbines and the IDF from the original proposal, to avoid areas that may support significant biodiversity values. Fauna habitat exclusion zones have also been incorporated around critical fauna habitats with a commitment of minimal disturbance. These exclusion zones will help to minimise clearing and associated fragmentation impacts around mapped fauna habitat.

Following construction, the rehabilitation of cleared areas can help to reduce any potential fragmentation or barrier impacts, which is discussed further in Section 8.6.

8.7.2.3 Increasing Access and Attraction of Scavenger and Feral Animals

Given the nature of the DE and surrounding area (open expanse), it is considered that the Proposal will not significantly increase accessibility to the area for feral animals due to the openness of the current landscape and existing presence of feral animals in the area. Therefore, no significant impacts on fauna are anticipated with respect to increasing access to the DE for feral animals.

Additionally, the Proposal will have an associated camp to accommodate up to 1,000 personnel during construction, and up to 100 personnel during operational activities. Waste disposal facilities associated with the camp can attract scavenging and feral fauna species if they are not appropriately managed. The presence of animal carcasses resulting from roadkill or collision with infrastructure can also act as an attractance for scavengers and feral fauna. This can result in increased pressure on the surrounding populations of native fauna species, including increased predation of Threatened and Migratory species by attracted introduced animals. Therefore, mitigation measures have been set out in Section 8.6, including the preparation of an EMP to outline how the environmental impacts of the Proposal will be monitored, reported and managed and includes measures to minimise this risk as far as practical (Appendix B).

8.7.2.4 Introduction and/or Spread of Weeds

The Proposal includes construction of approximately 300 km of roads for access between infrastructure and the main access via the GNH and Fortescue's Rail Maintenance Track. The construction activities can increase the risk of weed introduction through machines and personnel. Weed introduction can also be influenced by edge effects¹¹ on vegetation, due to clearing activities (Rowley, Edwards & Kelly, 1993).

Clearing for the Proposal will increase movement of vehicles in the DE during construction, including earth moving machinery which could result in the establishment of new populations of weed species. Areas of dense weed infestation can reduce the ability of fauna to traverse through their associated habitat and impact on their ability to forage (Stewart *et al.*, 2021). In addition, weed species that are palatable to feral herbivores can cause an increase of these animals within the area thereby causing potential land degradation and further spreading of weed species either by movement of soil or in the animal's dung (Hartley *et al.*, 2022; Norris

¹¹ Edge effects can occur at the boundary between cleared areas and the remaining vegetation, including effects associated with increased sunlight and wind; changes in plant and animal communities supported; increased risk of invasive species; or changes in soil composition and water runoff patterns.



& Low, 2005). Increased numbers of weeds can also significantly increase the risk of fire, which can impact on fauna habitat value (see Section 8.7.2.8).

As discussed in Section 8.4.2.1, according to the Recovery Plans for the Northern Quoll, weed infestation is one of the key threats to this species and therefore may be at elevated levels of risk with regard to this potential impact. However, given the effects of weed impacts on fauna habitat previously mentioned, the other ground dwelling species could also be impacted.

Comprehensive weed hygiene management will be enforced during construction and operation to maintain the quality of habitats, as detailed in Section 8.6. This includes an EMP that has been prepared to outline how the environmental impacts of the Proposal will be monitored, reported and managed and includes measures to minimise this risk as far as practical (Appendix B). With these measures in place, any risk of spreading weeds can be appropriately managed such that no significant impacts are anticipated.

8.7.2.5 Disrupted Behaviour of Nocturnal Fauna due to Artificial Light

Artificial light can impact Migratory and/or nocturnal Threatened species by changing predator and prey dynamics and movement, interfering with navigation, and impacting the physiology of circadian rhythm and reproduction (Biodiversity Council, 2023).

The construction of the Proposal will involve the use of artificial light to illuminate specific working areas throughout the DE, although the majority of the works are anticipated to occur during daylight hours which will reduce the need for substantial areas of artificial lighting. During operations, artificial light may be used for safety purposes and within facilities such as the maintenance staff camp.

Altered ambient lighting and increased artificial light may cause behavioural changes to all the Threatened, Priority and Migratory species likely to occur within the DE. The artificial light can cause changes to invertebrate behaviours, such as increased concentrations of individuals around heat and light sources, consequently causing changes to the behaviour of species that predate on the insects, in particular the Northern Quoll, Ghost Bat and PLNB.

Further, the predominantly nocturnal species likely to occur in the DE, including the Night Parrot, Northern Quoll, PLNB, Ghost Bat, and most of the Priority fauna considered, would be at increased risk of impacts due to their increased activity during the darker periods when artificial light is more likely to be required. Conversely, diurnal species such as the Grey Falcon would be impacted to a lesser extent.

To minimise the potential impacts of artificial light on fauna in the surrounding area, mitigation measures have been proposed and are presented in Section 8.6, which align with the National Light Pollution Guidelines for Wildlife (DCCEEW, 2023c). Given the extremely low levels of current ambient light sources in the DE, some increases in temporary and permanent lighting will be required and thus there might be minor impacts on fauna in close proximity to the Proposal. However, through the implementation of the mitigation measures outlined in Section 8.6, these impacts will be minimised such that the Proposal is unlikely to have a significant residual impact with regard to light impacts on fauna during construction or operation.

8.7.2.6 Disturbance from Noise and Vibration

Noise and vibration increases will occur mainly due to construction activities and will then decrease, though remaining slightly higher than baseline levels during the operational phase of the Proposal.



During the construction phase, noise and vibration are expected from the operation of construction plant and machinery, earthworks and general ground disturbing activities. It is not anticipated that a significant amount of blasting will take place.

During the operational activities, noise and vibration will occur as a constant, but with low intensity. The noise impacts of wind farms can be distinguished between two types: mechanical noise and aerodynamic noise. Overall, mechanical noise is not of high concern since it can be minimised through soundproofing materials. However, aerodynamic noise due to the wind turbine blades' rotation can affect fauna species (Pinto, Martins & Pereira, 2017) and is more challenging to mitigate. The sound associated with these activities can impact an animal's behaviour (i.e., avoidance, masking) or have physiological effects, reducing their overall survival and fitness (Teff-seker *et al.*, 2022). Elevated noise levels can also reduce reproductive success and, in severe cases, lead to complete abandonment of an area, such as caves.

Noise attributable to the Proposal above baseline levels may impact sensitive species, such as the Ghost Bat and PLNB, as mammals with superior hearing capabilities (Bat call, 2021a), as well as potentially causing changes to the fauna assemblage within habitats in close proximity to the construction areas. According to the Noise Assessment undertaken for the Proposal (Talis, 2024), the highest sound power levels will be experienced during the construction phase. Sound power levels of up to 117 dB may be generated by various types of equipment such as haul trucks, loaders/excavators, dozers, drill rigs and service trucks, which have the potential to temporarily impact Ghost Bat or PLNB nocturnal roost caves if present. As no roosts have been identified during the field surveys, no impacts from noise on these two species are anticipated.

The loudest construction activities would predominantly occur during the day when construction activity is generally higher, and therefore nocturnal species would be at a lower risk of impact given their reduced activity during the day. Operational noise is anticipated to be greatest around the immediate vicinity of the wind turbines with existing noise levels within the DE ranging from 19-57 dB(A) (Talis 2025). During higher windspeeds (when wind turbines would be the noisiest) localised noise generated by the wind as it moves through foliage will increase. As a result, background noise will be higher and potentially mask operational noise. Operational noise is not anticipated to exceed the noise level ranges recorded during baseline monitoring (Talis 2025). Overtime fauna are likely to habituate to continuous sound levels over time.

With regards to potential vibration impacts from operation of the Proposal, the source of vibrations in wind farms is the rotating parts of the turbines, such as rotor blades and generators. The rotation of these parts generates periodic vibrations that are transmitted to the ground via the foundations of the wind farm (Bosnjakovic *et al.*, 2024). These vibrations could impact ground dwelling fauna in the surrounding area, especially on their sensitive acoustic perception. However, studies have shown that, in most cases, wind farms had no significant effect on ground-dwelling animals (de Lucas *et al.*, 2005, Walter *et al.*, 2006, Helldin *et al.*, 2012, Łopucki and Mróz, 2016, Łopucki *et al.*, 2018). Therefore, it is considered that any potential vibration impacts would be localised and given the surrounding availability of similar habitats in the wider area, operational vibration impacts from the Proposal are unlikely to result in a significant impact to the conservation significant fauna species within the DE.

Standard construction noise management measures will be implemented, as set out in Section 8.6, which will reduce the construction noise as far as reasonably practicable. Additionally, it is expected that the increase in noise will naturally dissipate to imperceptible levels with



relatively short distances from the source (Talis, 2024). Given the extensive surrounding habitat that the fauna species can utilise, significant noise impacts are not anticipated for any of the species during construction. As operational noise levels would only increase in the immediate vicinity of the Proposal, significant impacts to fauna are not anticipated. Therefore, no specific mitigation measures are proposed.

8.7.2.7 Alteration or Creation of Microclimates

Wind farms have the potential to influence local and regional climates due to their modification of surface-atmosphere exchanges and the transfer of energy, momentum, mass, and moisture within the atmosphere (Zhou *et al.*, 2012). The land in and around the wind farm infrastructure can experience related temperature changes. Some studies have shown evidence of cooling during the day and warming temperatures during the night (Qin *et al.*, 2022). These differences in temperature can alter vegetation cover (Qin *et al.*, 2022) and consequently impact fauna habitat.

The exact mechanisms underlying these microclimate effects are not fully understood, however they arise from changes in local temperature, moisture and CO₂ levels due to vertical mixing, turbulence, and wakes created by wind turbines that extend well-beyond their local footprint (in the order of 10 km or more) (Fitch *et al.*, 2013a, Lundquist *et al.*, 2019). Given climate variables such as temperature and precipitation affect vegetation, in terms of plant growth and species composition, and habitat values, these microclimate effects created by wind farms in turn could impact the Threatened, Priority and Migratory species likely to occur within the DE by influencing the habitat and food sources for these species.

Without further data on the effects of wind turbines in this specific area of the Pilbara region, a worst-case approach has been taken assuming that implementation of the Proposal would alter local wind patterns by increasing wind speed and changing wind direction around the turbines, which would affect the distribution of heat and moisture in the area. It has also been assumed that the presence of the wind turbines would lead to slight increases in surface temperatures, particularly at night (Kaffine, 2019). This can occur due to the mixing of air layers caused by the turbine blades, which can bring warmer air down to the surface. Even in this scenario, given the low abundance of species likely to occur within the DE and surrounding region (Section 8.7.1), it is considered any localised impacts from alteration of microclimates would not significantly impact the vegetation and habitat composition in the wider area, and therefore would not be likely to impact these populations.

The species recorded in the DE are well adapted to the extreme hot summers and low or occasionally variable rainfall events associated with the existing Pilbara climate, therefore any slight increases in temperature or rainfall events would not be likely to cause significant impact to the fauna species present within the DE. Given the wide spacing distances between each of the turbines, any local microclimate changes are not considered significant with regard to fauna behaviour impacts.

As no significant impacts are anticipated with regard to alteration or creation of microclimates, no specific mitigation measures are proposed. However, the BBAMP incorporates monitoring measures designed to monitor the frequency of bird and bat mortality associated with the Proposal. Additional measures may be implemented following the investigation of triggers being reached or exceeded and inform appropriate responses or extension of the program's implementation. Through ongoing monitoring of impact trigger levels detailed in the BBAMP (Appendix I), and implementation of adaptive management, significant impacts to avifauna species are not anticipated.



8.7.2.8 Increased Risk of Bushfires

The Pilbara region bushfire season occurs from September to November, during the dry season (BoM, 2025). Most fire causes in the region are due to natural events, such as lightning strikes. However, a significant proportion of events have unknown or accidental causes. Comparatively, prescribed burns represent the smallest cause (Bryant, 2008)

According to the DBCA Fire History (DBCA, 2024c), over 75% of the DE has been impacted by fire between 2006 and 2024, equating to over 68,800 ha. The largest recorded recent fires within the DE occurred in 2019, impacting 25,900.49 ha (28.79%) of the DE. From 2020 to 2024, smaller, scattered fires impacted 7,888.47 ha (8.77%) of the DE. Prior to 2019, the most expansive fire events occurred in 2015 and 2016, impacting 14.66% and 10.32% of land within the DE respectively (ecologia, 2025b).

Wind turbines pose a risk of fire incidents, mostly associated with lightning strikes (by acting as conductors) and mechanical failures, often exacerbated by the presence of combustible material (You *et al.*, 2023). Similarly, electrical reticulation can cause wildfires through failures, pole top or transformer fires and also experience outages from wildfires (Panossian and Elgindy, 2023). Bushfires can have a detrimental effect on fauna habitat and lead to direct mortality of fauna.

Climate projections for northern Australian Rangelands, including the Pilbara, are that temperatures will continue to rise. By 2030, the mean annual warming across all emissions scenarios is projected to be about 0.6 to 1.4 °C above the climate of 1986–2005. By 2090, temperatures are projected to be 1.5 to 2.9 °C warmer under an intermediate emissions scenario (RCP 4.5) (DWER, 2021). A substantial increase in the temperature reached on the hottest days and the frequency of hot days is projected. Given these projections, it is anticipated that the bushfire risk and intensity of events will increase in response to the changing climate, which could further exacerbate the risks associated with the Proposal, thus impacting on fauna habitats.

It should be noted that due to the extensive recent fire history throughout the DE, the potential fuel load for bushfires is substantially reduced, which lowers the risk of further bushfires occurring within the DE.

Fire risk will be managed in accordance with Fortescue standard control measures, which aim to minimise risks as far as practical, as set out in Section 8.6, and is therefore not expected to pose a significant risk to fauna habitat or any of the Threatened, Priority or Migratory species considered.

8.7.3 Cumulative Impacts

Cumulative environmental impacts are the successive, incremental, and interactive impacts on the environment of a proposal with one or more past, present and reasonably foreseeable future activities (EPA, 2021). This section outlines the potential cumulative impacts to terrestrial fauna as a result of the Proposal and other surrounding developments either recently approved or currently under assessment.

In undertaking a cumulative impact assessment, the following assumptions are noted:

- Cumulative impacts resulting from third-party operations are based on information available in the public domain for third party operators and does not encapsulate impacts for all third-party operations in the region,



- Cumulative impact calculations generally do not take into consideration areas outside of those assessed under Part IV of the EP Act, or EPBC Act referrals, for each relevant proposal. Where relevant, large clearing permits under Part V of the EP Act may also be included depending on the quantity and quality of information available, and
- The accuracy of data from external sources will not be verified and it is assumed that data publicly available is accurate and collected in accordance with standard industry guidelines.

With regard to cumulative impacts on terrestrial fauna, the impacts assessment boundary should take account of the local population (as defined by Conservation Advice/Recovery Plan where relevant). For restricted species, this may be the same as the defined extent of occurrence or area of occupancy for that species. Similar projects within the same IBRA sub-region/s should also be considered, using land systems as surrogate for habitat overlaid with known range/records of occurrence for the species.

For the assessment of cumulative impacts to conservation fauna species, the projects were selected based on the following criteria:

- Proposals assessed and submitted between 2019 and 2026 (assumed to be 'reasonably foreseeable future activities' as proposals would generally be conditioned to commence implementation within five years of approval and are otherwise anticipated to be included in the existing environment data),
- Proposals within the Chichester subregion, and adjacent Fortescue subregion (due to similarities in habitat types and transient nature of fauna species), that generally intersect with similar dominant land systems to the Proposal IDF (including McKay Land System; Wona Land System; Robe Land System; and Bonney Land System), and
- Proposals that haven't started pre-construction activities yet.

There are several reasonably foreseeable developments within the Proposal region and, more broadly, within the Chichester and Fortescue subregions of the Pilbara bioregion. Although not directly comparable proposals, they do involve habitat removal, and therefore the projects in the Chichester and Fortescue subregions, and generally with similar dominant land systems, have been considered in this cumulative impact assessment. This includes:

- Nullagine Pilot Wind Farm Project,
- East Hamersley Railway Project,
- Hemi Gold Project,
- Jimblebar Hub Significant Amendment,
- McPhee Creek Iron Ore Project,
- Mulga Downs Hub and Rail Spur,
- North Star Magnetite Project Extension,



- Nyidinghu Iron Ore Mine,
- Ridley Magnetite Project, and
- Sulphur Springs Zinc-Copper Project.

The cumulative impacts to Terrestrial Fauna habitats anticipated to occur as a result of this Proposal in combination with the projects identified above are summarised in Table 8-32. Some important environmental features such as roost caves and pools are not considered in the cumulative impact assessment as the Proposal has been designed to avoid direct impacts to these features are therefore not impacted as a result of the Proposal. In line with the commitments outlined in the BBAMP (Appendix I), adaptive management will be implemented for the Proposal at turbines found to be of higher collision risk to ensure that important flightpaths are not significantly impacted, and thereby avoiding potential for cumulative impacts of wind turbines occupying important flightpaths between roosting and foraging sites.



Table 8-32: Impacts Associated with Other Surrounding Projects

The Proposal and cumulative projects	Reported direct impacts	
	Habitat removal	Significant species impacted
The Proposal	Removal of 910.26 ha of terrestrial fauna habitat, including: <ul style="list-style-type: none"> • Drainage line/river/creek (major) – 1.42 ha, • Drainage line/river/creek (minor) – 2.50 ha, • Granite outcrops (flat dome) – 0.39 ha, • Plain (cracking clays) – 87.19 ha, • Plain (stony/gibber) – 786.80 ha, • Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – 26.40 ha, and • Woodland (open) – 5.56 ha. 	Clearing of critical habitat for: <ul style="list-style-type: none"> • Grey Falcon – 1.42 ha, • Northern Quoll – 14.96 ha, • PLNB – 27.82 ha, • Ghost Bat – 27.82 ha, • Night Parrot – 281.81 ha, • Peregrine Falcon – 27.82 ha, and • Pilbara Olive Python – 27.82 ha.
Nullagine Pilot Wind Farm	Removal of 297.21 ha of terrestrial fauna habitat, including: <ul style="list-style-type: none"> • Drainage line/river/creek (major) – 0.34 ha, • Drainage line/river/creek (minor) – 10.47 ha, • Plain (stony/gibber) – 282.55 ha, and • Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – 0.01 ha. 	Clearing of critical habitat for: <ul style="list-style-type: none"> • Northern Quoll – 0.35 ha, • PLNB – 0.35 ha, • Grey Falcon – 0.34 ha, and • Ghost Bat – 0.35 ha.
East Hamersley Railway Project*	Removal of 4,387 ha of terrestrial fauna habitat, including those similar to the proposal*: <ul style="list-style-type: none"> • Woodland (open/closed) – 12,057.12 ha, • Drainage line/river/creek (minor) – 3,073.57 ha, • Plain (stony/gibber) – 404.08 ha, • Drainage line/river/creek (major) – 389.73 ha, and • Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – 116.72 ha. 	Clearing of critical habitat for: <ul style="list-style-type: none"> • Northern Quoll – 116.72 ha, • PLNB – 506.45 ha, • Ghost Bat – 506.45 ha, • Night Parrot – 404.08 ha, • Pilbara Olive Python – 506.45 ha, • Grey Falcon – 389.73 ha, and • Peregrine Falcon – 389.73 ha.
Hemi Gold Project	Removal of 5,978 ha of terrestrial fauna habitat, including those similar to the proposal: <ul style="list-style-type: none"> • Woodland (open) – 5,100 ha, and 	Clearing of critical habitat for: <ul style="list-style-type: none"> • Northern Quoll – up to 45.00 ha, • PLNB – 45.00 ha,



The Proposal and cumulative projects	Reported direct impacts	
	Habitat removal	Significant species impacted
	<ul style="list-style-type: none"> • Drainage line/river/creek (major) – 45 ha. 	<ul style="list-style-type: none"> • Ghost Bat – 45.00 ha, • Pilbara Olive Python – 45.00 ha, and • Grey Falcon – 45.00 ha.
Jimblebar Hub	Removal of 1,574.1 ha of terrestrial fauna habitat, including those similar to the proposal: <ul style="list-style-type: none"> • Rocky escarpments (ridges/ mesa/cliffs/outcrops/breakaways) – 2.5 ha, • Drainage line/river/creek (major) – 15.9 ha, • Drainage line/river/creek (minor) – 24.7 ha, and • Plain (stony/gibber) – 16.9 ha. 	Clearing of critical habitat for: <ul style="list-style-type: none"> • Northern Quoll – 2.5 ha, • PLNB – 18.40 ha, • Ghost Bat – 18.40 ha, and • Night Parrot – 16.90 ha.
McPhee Creek Iron Ore Project	Removal of 1,913 ha of terrestrial fauna habitat, including those similar to the proposal: <ul style="list-style-type: none"> • Drainage line/river/creek (major) – 55 ha, • Woodland (open) – 24.5 ha, and • Rocky escarpment (ridges/ mesa/cliffs/outcrops/breakaways) – 17.0 ha. 	Clearing of critical habitat for: <ul style="list-style-type: none"> • Northern Quoll - 615.20 ha, • PLNB – 72.00 ha, • Ghost Bat – 72.00 ha • Pilbara Olive Python – 670.20 ha, and • Grey Falcon – 55.00 ha.
Mulga Downs Hub and Rail Spur	Removal of 2,282.88 ha of terrestrial fauna habitat, including those similar to the proposal: <ul style="list-style-type: none"> • Drainage line/river/creek (major) 77.40 ha, • Woodland (open) – 91.52 ha, • Plain (stony/gibber) – 1,010.14 ha, • Plain (cracking clay) – 189.80 ha, • Drainage line/river/creek (minor) – 56.72 ha, and • Rocky escarpments (ridges/ mesa/cliffs/outcrops/breakaways) – 0.47 ha. 	Clearing of critical habitat for: <ul style="list-style-type: none"> • Northern Quoll - 48.54 ha, • PLNB – 77.87 ha, • Ghost Bat – 77.87 ha, • Night Parrot – 1, 010.14 ha, and • Pilbara Olive Python – 48.53 ha.
North Star Magnetite Project Extension	Removal of 606.9 ha of terrestrial fauna habitat, including those similar to the proposal: <ul style="list-style-type: none"> • Drainage line/river/creek (minor) – 6.4 ha, and 	Clearing of critical habitat for: <ul style="list-style-type: none"> • Northern Quoll – 36.00 ha,



The Proposal and cumulative projects	Habitat removal	Reported direct impacts Significant species impacted
	<ul style="list-style-type: none"> Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – 14.9 ha. 	<ul style="list-style-type: none"> PLNB – 36.00 ha, Ghost Bat – 14.90 ha, and Pilbara Olive Python – 69.00 ha.
Nyidinghu Iron Ore Mine	Removal of 12,365 ha of terrestrial fauna habitat, assemblage unknown.	A quantifiable amount of critical habitat to be removed is not available however no significant impacts are reported.
Ridley Magnetite Project	Removal of 8,484 ha of terrestrial fauna habitat, assemblage unknown.	A quantifiable amount of critical habitat to be removed is not available however no significant impacts are reported.
Sulphur Springs Zinc-Cooper Project	Removal of 313.6 ha of terrestrial fauna habitat, including those similar to the proposal: <ul style="list-style-type: none"> Drainage line/river/creek (major) – 4.7 ha, Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – 39.7 ha, and Plain (stony/gibber) – 38.8 ha. 	A quantifiable amount of critical habitat to be removed is not available however no significant impacts are reported.
Native Vegetation Clearing Permits: 9195, 9903, 9910, 10494	Removal of 917.24 ha of terrestrial fauna habitat.	A quantifiable amount of critical habitat to be removed is not available however no significant impacts are reported.
Cumulative Total	39,081.19 ha of habitat clearance, with some similar habitat types across the project areas, including: <ul style="list-style-type: none"> Drainage line/river/creek (major) – 589.47 ha, Drainage line/river/creek (minor) – 3,174.36 ha, Granite outcrops (flat dome) – 0.39 ha, Plain (cracking clays) – 276.99 ha, Plain (stony/gibber) – 2,539.27 ha, Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – 217.70 ha, and Woodland (open) – 17,278.70 ha. 	Clearing of critical habitat for: <ul style="list-style-type: none"> Northern Quoll – 879.27 ha, PLNB – 762.79 ha, Ghost Bat – 762.79 ha, Night Parrot – 1,712.93 ha, Grey Falcon – 491.49 ha, Peregrine Falcon – 417.55 ha, and Pilbara Olive Python – 1,367.00 ha.



The Proposal and cumulative projects	Reported direct impacts	
	Habitat removal	Significant species impacted
Cumulative Extent of Habitats	<p>The total mapped habitat extents from each of the cumulative projects include:</p> <ul style="list-style-type: none"> • Drainage line/river/creek (major) – 6,060 ha, • Drainage line/river/creek (minor) – 15,190 ha, • Granite outcrops (flat dome) – 12 ha, • Plain (cracking clays) – 6,936 ha, • Plain (stony/gibber) – 88,695 ha, • Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – 3,944 ha, and • Woodland (open) – 107,368 ha. 	<p>The total mapped habitat extent of critical habitat from each of the cumulative projects includes:</p> <ul style="list-style-type: none"> • Northern Quoll – 6,584 ha, • PLNB – 11,475 ha, • Ghost Bat – 11,474 ha, • Night Parrot – 32,906 ha, • Grey Falcon – 4,507 ha, • Peregrine Falcon – 5,398 ha, and • Pilbara Olive Python – 10,330 ha.
% Cumulative Impacts	<p>The percentage of cumulative impact of the mapped extent includes:</p> <ul style="list-style-type: none"> • Drainage line/river/creek (major) – 10%, • Drainage line/river/creek (minor) – 21%, • Granite outcrops (flat dome) – 3%, • Plain (cracking clays) – 4%, • Plain (stony/gibber) – 3%, • Rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) – 6%, and • Woodland (open) – 16%. 	<p>The percentage of cumulative impact of the mapped extent includes:</p> <ul style="list-style-type: none"> • Northern Quoll – 13%, • PLNB – 7%, • Ghost Bat – 7%, • Night Parrot – 5%, • Grey Falcon – 11%, • Peregrine Falcon – 8%, and • Pilbara Olive Python – 13%.

*The fauna habitat values for the East Hamersley Railway Project are for the Development Envelope for the Project. The Proposal is still being assessed and a clearing footprint has not been defined, therefore the areas included in Table 8-32 are considered conservative and are likely greater than the amount to be cleared for the project.



[This page has been left blank intentionally]



A summary of the cumulative assessment detailed in Table 8-32, for each of the relevant significant species, is provided below. Only those species for which cumulative impacts have been identified are discussed (i.e. where one or more of the identified cumulative projects impacts similar important habitats to the Proposal).

Northern Quoll

The cumulative assessment for Northern Quoll critical habitat identified a combined total of 879.27 ha of clearing. Clearing associated with the Proposal represents 2% of this total. The total cumulative clearing represents 13% of the mapped extents across the survey areas associated with the cumulative projects. However, Northern Quoll critical habitat occurs within 12 land systems within the Fortescue and Chichester subregions and is more widely represented outside of these survey areas. The cumulative critical habitat clearing represents 0.02% of these land systems within the Fortescue and Chichester subregions.

Ghost Bat and PLNB

The cumulative assessment for Ghost Bat and PLNB critical habitat identified a combined total of 762.79 ha of clearing. Clearing associated with the Proposal represents 4% of this total. The total cumulative clearing represents 7% of the mapped extents across the survey areas associated with the cumulative projects. However, Ghost Bat and PLNB critical habitat occurs within 14 land systems within the Fortescue and Chichester subregions. The cumulative critical habitat clearing represents 0.01% of these land systems within the Fortescue and Chichester subregion.

Night Parrot

The cumulative assessment for Night Parrot critical habitat identified a combined total of 1,712.93 ha of clearing. Clearing associated with the Proposal represents 16% of this total. The total cumulative clearing represents 5% of the mapped extents across the survey areas associated with the cumulative projects. However, Night Parrot critical habitat occurs within 18 land systems within the Fortescue and Chichester subregions and is more widely represented outside of these survey areas. The cumulative critical habitat clearing represents 0.07% of these land systems within the Fortescue and Chichester subregions.

Grey Falcon

The cumulative assessment for Grey Falcon critical habitat identified a combined total of 491.49 ha of clearing. Clearing associated with the Proposal represents 0.3% this total. The total cumulative clearing represents 11% of the mapped extents across the survey areas associated with the cumulative projects. However, critical habitat for the Grey Falcon critical habitat occurs within eight land systems within the Fortescue and Chichester subregions and is more widely represented outside of these survey areas. The cumulative clearing of this habitat represents 0.03% of these land systems in the Fortescue and Chichester subregions.

Peregrine Falcon

The cumulative assessment for Peregrine Falcon critical habitat identified a combined total of 417.55 ha of clearing. Clearing associated with the Proposal represents 7% of this total. The total cumulative clearing represents 8% of the mapped extents across the survey areas associated with the cumulative projects. However, the habitat types critical to the survival for this species are recorded across eight land systems in the Fortescue and Chichester



subregions and is more widely represented outside of these survey areas. The cumulative clearing represents 0.03% of the critical habitat mapped in these land systems within the Fortescue and Chichester subregions.

Pilbara Olive Python

The cumulative impact to Pilbara Olive Python critical habitat is anticipated to be 1,367 ha. Clearing associated with the Proposal represents 2% of this total. The total cumulative clearing represents 13% of the mapped extents across the survey areas associated with the cumulative projects. However, the critical habitat types are recorded across eight land systems in the Fortescue and Chichester subregions and is more widely represented outside of these survey areas. The cumulative clearing represents 0.04% of the land systems where critical habitat for this species occurs within the Fortescue and Chichester subregions.

Given the low proportionate impacts on the critical habitat for the above species within the DE, and the wider habitat available outside of the DE for all species discussed, cumulative impacts from clearing are not expected to be significant.

8.8 Environmental Outcomes

Table 8-33 summarises the expected environmental outcomes for the Proposal, following the implementation of mitigation and management measures. The environmental outcomes proposed are mainly outcome-based conditions. However, environmental objectives are proposed in some cases as there are several factors outside Fortescue's control that will influence an outcome. These cases require an assessment from a subject matter expert to assess whether the objectives are achieved.



[This page has been left blank intentionally]



Table 8-33: Summary of Residual Impacts for Terrestrial Fauna after Mitigation Measures

Potential impact	Residual impact after management	Regional significance	Proposed Environmental Outcomes
Loss of fauna habitat	<p>Loss of 910.26 ha of fauna habitat. Rehabilitation post construction will re-establish fauna habitat in some disturbed areas. There will be some permanent loss of habitat for drainage line/river/creek (major), drainage line/river/creek (minor), granite outcrops (flat dome), plain (cracking clays), plain (stony/gibber), rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways), and woodland (open).</p> <p>Critical habitat will be cleared for the Grey Falcon, Northern Quoll, PLNB, Ghost Bat, Night Parrot, Pilbara Olive Python and Peregrine Falcon.</p>	<p>Although there are supporting and critical habitats for the listed fauna species within the IDF, the habitat types are common throughout the local area and wider region. The proportionate impact on the regional habitat availability is negligible for all species. Residual impacts are considered minimal in relation to conservation significant habitat at a regional scale. The clearing of PLNB and Ghost bat critical habitat is considered a potentially significant residual impact that may require offsets. No roosting caves have been identified within the DE. The clearing for Northern Quoll critical habitat will be offset in line with State and Commonwealth offsets policies and requirements, and the remaining residual impacts are not considered significant.</p>	<p>TF-1 Environmental Outcome: Disturbance of critical fauna habitat not to exceed:</p> <ul style="list-style-type: none"> • Clearing of no more than 1.42 ha of habitat identified as being critical to the survival of the Grey Falcon, • Clearing of no more than 14.95 ha of habitat identified as being critical to the survival of the Northern Quoll, • Clearing of no more than 238.24 ha of habitat identified as being critical supporting to the survival of the Northern Quoll, • Clearing of no more than 27.82 ha of habitat identified as being critical to the survival of the Ghost Bat and PLNB, • Clearing of no more than 27.82 ha of critical habitat for the Pilbara Olive Python within the DE will occur, • Clearing of no more than 281.81 ha of habitat identified as being critical to the survival of the Night Parrot, • Clearing of no more than 1.42 ha of potential Australian Painted Snipe and Common Greenshank dispersal and foraging habitat , and • Clearing of no more than 27.82 ha of habitat identified as being critical to the survival of the Peregrine Falcon. <p>TF-2 Environmental Outcome: Fauna Habitat Exclusion Zones (FHEZ) have been proposed to minimise impacts on critical fauna habitats and to ensure no disturbance occurs within these areas, these areas include:</p>
Fragmentation of habitat and creating a barrier to fauna movement	<p>Given the linear nature of the Proposal, the infrastructure and associated clearing will fragment some areas of habitat, however the areas of intact habitat will be substantial and the electrical reticulation will not prevent the passage of fauna between units. In addition, following construction, the rehabilitation of cleared areas can help reduce the magnitude of potential fragmentation impacts. Therefore, overall significant impacts as a result of habitat fragmentation or barrier to fauna movement are not anticipated for any of the species considered.</p>	<p>Due to the size of the remaining habitat areas, fragmentation of habitat types within the DE is not expected to be significant.</p>	



Potential impact	Residual impact after management	Regional significance	Proposed Environmental Outcomes
			<ul style="list-style-type: none"> FHEZ of 5,894.74 ha of Rocky Escarpment habitat (including 1 km buffer), FHEZ of 5,441.33 ha of Major Drainage Line/River/Creek habitat (including 500 m buffer, which allows for clearing but no turbines to be installed), and FHEZ of 1,815.59 ha of Hills/Ranges/Plateaux (including 1 km buffer). <p>Management of potential impacts from clearing of conservation significant fauna can be regulated under Part V of the EP Act.</p>
Collision with operational wind turbines	<p>Given the relatively low abundance of the conservation significant species recorded during the surveys, and therefore relatively low mortality rates expected, collision with the operational infrastructure is not expected to result in a significant impact that would affect the majority of species on a population level.</p> <p>The Grey Falcon was observed within the DE flying at heights that intersect with the RSA (ecologia, 2026), therefore there is a residual risk that the Grey Falcon may collide with the operational wind turbines. However, Grey Falcon hunting and breeding activities primarily occur within the Drainage Line/River/Creek habitat types. Many of the Grey Falcon sightings have been recorded within creek lines and rivers or adjacent habitat, with the Bonnie Creek, Nullagine River, Coongan River and associated tributaries providing movement corridors for the species within</p>	<p>Due to the abundance of habitat outside the DE, and the relatively low abundance of conservation significant bird and bat species utilising the DE, impacts from collision are not likely to be significant on a regional scale and are not likely to impact species at a population level.</p> <p>As the total population of the Grey Falcon is estimated to be less than 1,000 mature individuals (Mullin <i>et al.</i>, 2020), the risk of an individual mortality may present a potentially significant impact to the species. Both CRMs rated the Grey Falcon of being in danger of losing approximately 2% of the modelled local population each year due to collision with the WTG. This is a relatively low value (estimated 1 bird collision every ~12 years for the adult population of ~2 pairs), and therefore the population is anticipated to maintain sustainable levels..</p>	<p>TF-3 Environmental Objective:</p> <p>Implementation of the Bird and Bat Adaptive Management Plan (BBAMP) to monitor and minimise collision risk impacts to species.</p> <p>Management of potential impacts to collision of avian fauna with wind turbines can be managed by the implementation of a BBAMP under the Mining Act.</p>



Potential impact	Residual impact after management	Regional significance	Proposed Environmental Outcomes
	the survey area. Therefore, with the substantially reduced number of turbines proposed compared to the original design, and incorporation of fauna habitat avoidance areas around the majority of Drainage Line/River/Creek habitat types, , potential collision risk will be minimised as far as possible.		
Vehicle interactions	There is a residual risk of fauna collision with vehicles associated with construction and operation of the Proposal, however with the implementation of the recommended mitigation measures, such as adherence to strict speed limits on site, impacts are not anticipated to be significant.	No significant impacts are anticipated on a regional scale.	No condition required as no significant impact anticipated
Habitat degradation	With the implementation of the standard mitigation measures, indirect impacts on vegetation as a result of the Proposal are not anticipated to be significant for any of the environmental values assessed. Therefore, the potential for habitat degradation as a result of changes in vegetation health is also not anticipated to be significant.	No significant impacts on vegetation health on a local or regional scale.	No condition required as no significant impact anticipated
Attraction of scavenger's and feral animals	A residual risk will remain, however standard mitigation measures will be implemented to minimise possible introduction or increase of feral animals within the DE, including ensuring appropriate food waste management from site operatives. Consequently, with the appropriate waste control measures in place and education through inductions for all site operatives, the risk of attracting	No significant impacts are anticipated on a regional scale.	As per environmental objective FV-5



Potential impact	Residual impact after management	Regional significance	Proposed Environmental Outcomes
	scavenger's and feral animals is considered to be appropriately managed such that no significant impacts are anticipated.		
Increase risk of weeds introduction	Following implementation of the recommended weed hygiene measures outlined in Section 8.6, the risk of introducing and spreading weeds will be appropriately managed such that no significant impacts are anticipated.	No significant impacts are anticipated on a regional scale.	As per environmental objective FV-5 Management of potential impacts from weeds can be regulated under the Mining Act.
Disturbance from noise and vibration and artificial lighting	<p>A residual risk remains for disturbance of fauna from elevated levels of noise or artificial light during the construction phase. Fauna may be attracted to areas where prey such as insects are attracted to the light emissions. Light emissions may also cause other behaviour responses such as changing the timing of fauna individuals' activities or avoidance of the area.</p> <p>Noise is an environmental stressor which has the potential to impact the way fauna interact with their habitats such as avoidance of noisy areas or reduction in foraging success due to masking. However, due to the temporary and localised nature of the construction noise and light emissions, remaining surrounding habitat, these impacts are not expected to be significant.</p> <p>Overall, the potential impacts to terrestrial fauna from construction and operational activities will be controlled through standard best practice construction site management measures, which are listed</p>	No significant impacts are anticipated on a regional scale.	No condition required as no significant impact anticipated. Management of these potential impacts can be regulated under the Mining Act.



Potential impact	Residual impact after management	Regional significance	Proposed Environmental Outcomes
	In Section 8.6. As such, no significant impacts to terrestrial fauna from noise, vibration and artificial lighting are expected.		
Alteration or creation of microclimates around turbines	Localised microclimate impacts could occur causing alterations in temperature and moisture levels which could impact the Threatened, Priority and Migratory species that are adapted to specific conditions within the Pilbara. However, given the low abundance of species recorded and extensive surrounding areas of suitable habitat for all the species likely to occur within the DE, it is considered any localised impacts from alteration of microclimates would not be significant at a species or regional level.	No significant impacts are anticipated on a regional scale; however, the BBAMP will monitor and investigate collisions and implement management measures should these be required.	As per environmental objective TF-3
Increased risk of bushfires	Following implementation of the recommended fire risk management measures outlined in Section 8.6, the increased risk of bushfires as a result of the Proposal will be appropriately managed such that no significant impacts are anticipated.	No significant impacts are anticipated on a regional scale.	As per environmental objective FV-5 Management of potential impacts from bushfires can be regulated under the Mining Act.



[This page has been left blank intentionally]



Following the implementation of the management measures identified above, the clearing of Northern Quoll critical habitat is considered a significant residual impact. Based on the number of individuals identified and frequency of detections during field surveys, the northern half of the DE appears to support a high density, reproductive population of Northern Quolls (ecologia, 2025b). Therefore, habitat in the northern portion of the DE is considered critical habitat for the Northern Quoll (ecologia, 2025b). The Northern Quoll critical habitat required to be cleared is the rocky escarpments (ridges/mesa/cliffs/outcrops/breakaways) (ecologia, 2025b). These residual impacts are considered significant and will require offsetting. Offsets are discussed in further detail in Section 12.

The clearing of PLNB and Ghost Bat critical habitat is considered a potentially significant residual impact. Clearing of potential roosting habitat may limit the ability of the species to inhabit the DE should other habitats surrounding the DE become unsuitable. The PLNB and Ghost Bat critical habitat required to be permanently cleared is the drainage line/river/creek (major) and rocky escarpment (ridges/mesa/cliffs/outcrops/breakaways) habitat types. The hills/ranges/plateaux and gorges/gullies habitat types are also considered critical habitat for the species, however neither of these habitats will be cleared for the Proposal. These residual impacts are considered potentially significant and may require offsetting. Offsets are discussed in further detail in Section 12. The clearing of critical and supporting habitat for the remaining conservation listed species, with potential to occur in the DE (Night Parrot, Pilbara Olive Python, Grey Falcon, and Peregrine Falcon), is not considered to be significant as discussed in Section 8.7.1.1. This is primarily due to the low abundance of records of these species from the fauna surveys within the DE (ecologia, 2025b; ecologia, 2026) and the substantial areas of similar habitat within the surrounding areas that will not be disturbed as a result of the Proposal.

Collision risk with the operational Proposal for avifauna and bats will be minimised as far as possible, however given the Grey Falcon's EPBC listing (Vulnerable) and assumed relatively low abundance, individual mortality of this species could present a potentially significant impact. Other potential direct and indirect impacts to terrestrial fauna associated with the Proposal will not be significant at the local or regional scale as they will be appropriately managed through site-specific mitigation outlined in Section 8.6. Given the relatively small extent of the proposed clearing of habitat types identified as being significant for conservation listed species, this clearing will not result in a significant residual impact.

Through implementation of the proposed environmental outcomes and objectives (Table 8-33), together with the offsetting of significant residual impacts will result in the biological diversity and ecological integrity of the DE being preserved. The Proposal is consistent with the EPA's environmental objective for Terrestrial Fauna.



9 SOCIAL SURROUNDINGS

9.1 EPA Objective

The WA EPA defines this factor as '*social surroundings is a part of the environment that may require consideration*' where there is a '*clear link between a proposal or scheme's impact on the physical or biological surroundings and the subsequent impact on a person's aesthetic, cultural, economic or social surroundings*' (EPA, 2023b).

The WA EPA objective for the social surroundings environmental factor is '*To protect social surroundings from significant harm*' (EPA, 2023b).

Aboriginal Cultural Heritage for the Proposal refers to Heritage Places and other cultural values such as culturally significant plants and animals, use of country for traditional activities, and cultural values of waterways.

9.2 Policy and Guidance

The following EPA policies and guidelines have been considered for the Proposal to meet the EPA's objective in relation to this factor:

- Statement of Environmental Principles, Factors and Objectives (EPA, 2023a),
- Environmental Factor Guideline – Social Surroundings (EPA, 2023b), and
- Technical Guidance: EIA of Social Surroundings – Aboriginal Cultural Heritage (EPA, 2023c).

Other policy and guidance relevant to this factor includes:

- Environmental Protection (Noise) Regulations 1997 (Noise Regulations),
- *Aboriginal Heritage Act 1972* (AH Act),
- ICOMOS Burra Charter 2013,
- *Native Title Act 1993*,
- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*,
- Visual Landscape Planning in Western Australia: a manual for evaluation, assessment, siting and design (Department for Planning and Infrastructure, 2007),
- Planning Bulletin 67 Guidelines for Wind Farm Development (WAPC, 2004),
- State Planning Policy No 2 Environment and Natural Resources (WAPC, 2003),
- Environmental, health, and safety guidelines for wind energy (World Bank Group, 2015),
- Aboriginal Heritage Due Diligence Guidelines (DAA & DPC, 2013), and



- Draft Guideline: Dust Emissions (DWER, 2021e).

9.3 Surveys and Studies

The technical studies relating to Social Surroundings undertaken for the Proposal area described in Table 9-1 and Table 9-2.

It is important to note that since the technical studies were completed, the Proposal has been significantly scaled back, with the number of turbines reduced from 200 to 100 and the IDF area reduced from approximately 2,044 ha to 944.07 ha. As a result, the surveys and assessments referenced below were based on a larger project footprint. Any negative impacts previously identified are therefore likely to be lower than those originally reported.

Table 9-1: Social Surroundings Studies Undertaken for the Proposal

Report/study	Organisation	Scope
Bonney Downs Wind – Project Dust Assessment (2025)	GHD	The dust modelling risk assessment includes the assessment of the potential direct and indirect impacts associated with dust from the Proposal's operations, and the risk and management to key sensitive receptors associated with the Proposal. The scope includes, but is not limited to: <ul style="list-style-type: none"> • A description of the surrounding environment, including sensitive receptors and places, • A description of the potential sources of air emissions that may be generated during construction and operation of the Proposal, and • Dust modelling to determine impacts during construction and operations phase of the Proposal.
Bonney Downs Wind – Project Noise Assessment (2024a)	Talis consultants	The report assessed and quantified the potential received noise levels during construction and operation phases of the Proposal at sensitive receivers and cultural receptors. The study included an in-field noise demonstration with Palyku traditional owners at Bonnie Pool.
Bonney Downs Fauna Noise Impact Study (2025)	Talis consultants	The report assessed the potential noise impacts from the proposed Bonney Downs Wind Farm on culturally significant fauna, particularly kangaroos, emus, and echidnas. The study quantified received noise levels and evaluated behavioural, communication, and physiological effects. This study addresses Traditional Owner concerns through modelling and a risk-based impact assessment.
Bonney Downs Wind – Construction Vibration Addendum (2024b)	Talis consultants	The report provides an overview of possible vibration impacts from the Proposal and inform any ground-borne vibration risk associated with possible blasting and construction activities.
Visual Impact Assessment Bonney Downs Wind Farm (2024b)	SLR	The report provides an assessment of direct and/or indirect impacts on visual amenities at 13 Points of Interest. To support the VIA, augmented reality was also used to consult with Palyku and Niyaparli on potential visual amenity impacts.
Traditional Ecological Knowledge	Terra Rosa Consulting	Traditional Ecological Knowledge (TEK) assessments have commenced within the DE to identify and document plants and animals of traditional use or value to Palyku traditional owners. Cultural associations to ecological features and areas containing culturally significant species will be documented. These assessments were undertaken in consultation with Traditional Owner knowledge holders and nominated representatives.



Report/study	Organisation	Scope
		Niyaparli did not raise impacts to TEK values as a concern given the minimal disturbance on their country. Their concerns were around maintaining biodiversity which can be addressed through the Flora and Fauna studies. TEK assessments are still ongoing for the Proposal.
Archaeological Surveys	Terra Rosa Consulting, Echoes, and Coongan	These surveys are undertaken to identify and record archaeological heritage sites (such as artefact scatters, engravings (rock art), and grinding patches) as defined under the AH Act. Archaeological surveys are undertaken in consultation with Palyku and Niyaparli knowledge holders for the area. Archaeological survey reports remain the property of the Traditional Owners.
Ethnographic Surveys	Terra Rosa Consulting and Snappy Gum	These surveys are undertaken to identify and record ethnographic heritage sites (such as mythological or ceremonial places, or song lines) as defined under the AH Act. Ethnographic surveys are undertaken in consultation with Palyku and Niyaparli knowledge holders for the area. Ethnographic survey reports remain the property of the Traditional Owners.



[This page has been left blank intentionally]



Table 9-2: Heritage and Traditional Ecological Knowledge Surveys Undertaken in Relation to the Proposal

Survey ID	Date	Consultancy	Survey Type	Key Outcomes	Report Reference
Palyku					
2022_PAL_Trip4	1 – 2 July 2022	Terra Rosa Consulting	Ethnographic and Archaeological		Terra Rosa, A. Morison, A. Reynolds July 2022, PA
2023_PAL_Trip7	7 – 9 July 2023	Terra Rosa Consulting	Ethnographic and Archaeological		Terra Rosa, D. Lakic, July 2023, Final report
2024_PAL_Trip5	23 May- 3 June 2024	Terra Rosa Consulting	Ethnographic and Archaeological		Terra Rosa, S. Liddelow, June 2024, PA
2024_PAL_Trip10	22 July - August 2024	Terra Rosa Consulting	Ethnographic and Archaeological		Terra Rosa, Lucy Clark, August 2024, PA
2024_PAL_Trip16a	12 – 19 November 2024	Terra Rosa Consulting	Ethnographic and Archaeological		Terra Rosa, D. English & I. Omeri, November 2024 PA
2024_PAL_Trip17r1	25 November – 4 December 2024	Terra Rosa Consulting	Archaeological		Terra Rosa, E. Biggs, December 2024 PA



Survey ID	Date	Consultancy	Survey Type	Key Outcomes	Report Reference
2022_PAL_Trip2	28 – 30 June 2022	Terra Rosa Consulting	Ethnographic		Terra Rosa, A. Morison, A. Reynolds July 2022, PA
2024_PAL_Trip1	22 – 27 February 2024	Terra Rosa Consulting	Ethnographic		Terra Rosa, A. Swenson and M. McElligott, June 2024, Final Report
2024_NYI_Trip12	14 - 23 August 2024	Snappy Gum	Ethnographic and Archaeological		Snappy Gum. A. Millard. October 2024, PA.
2024_PAL_Trip16b	12 – 19 November 2024	Terra Rosa Consulting	Ethnographic		Terra Rosa, D. English & I. Omeri, November 2024 PA



Survey ID	Date	Consultancy	Survey Type	Key Outcomes	Report Reference
Niyaparli					
2020_NYI_Trip2	07 – 18 July 2020	Coongan	Archaeological		Coongan, S Keiller, C Sims and J Harris, Aug 2020
2024_NYI_Trip7	19 – 28 June 2024	Echoes	Archaeological		Echoes. P, Ryan. July 2024, PA.; Echoes. C, Callaway., P, Ryan. August 2024, Report
2024_NYI_Trip10	15 – 22 Aug 2024	Coongan	Archaeological		Coongan. A, Cooper., T, Wilce., N, Charlwood. September 2024, PA.
2024_NYI_Trip12	9 – 18 Oct 2024	Snappy Gum	Ethnographic		Snappy Gum, A Millard, K Cue, Oct 2024 PA.
2025_NYI_Trip2	12 – 21 Mar 2025	Coongan	Archaeological		Coongan, L Ashworth, March 2025 PA



[This page has been left blank intentionally]



Fortescue has engaged with PJAC and KNAC to facilitate heritage surveys, TEK surveys (where required), and on-Country social surrounds consultation to understand the social, cultural, and heritage values within, and surrounding the DE.

Heritage and TEK surveys are still ongoing in collaboration with the relevant Native Title groups. Results of these surveys will be taken into consideration for this Proposal.

9.4 Receiving Environment

9.4.1 Native Title

Most of the DE is located within the Palyku Part A native title determination area (WCD2019/002) and is the traditional lands of the Palyku People (Palyku). A small section of the DE intersects with the Nyiyaparli and Nyiyaparli #3 native title determination area (WCD2018/008) and is the traditional lands of the Nyiyaparli People (Nyiyaparli). The registered native title body corporate (RNTBC) representing the Palyku People is the PJAC and the RNTBC for the Nyiyaparli People is KNAC.

Fortescue has and will continue to engage with Palyku and Nyiyaparli native title stakeholders through the relevant RNTBCs regarding the development of the Proposal. Early engagement was undertaken with Palyku and Nyiyaparli to ensure collaborative planning and key concerns regarding potential impacts to cultural values were considered in the design and management of the Project.

9.4.2 Aboriginal Cultural Heritage

9.4.2.1 Cultural Values Management Framework

Fortescue has developed a framework for managing the cultural values of relevant Native Title stakeholders through informed consultation and the development of appropriate management strategies. The purpose of this framework is to ensure adequate baseline data, assessments, and consultation is undertaken to inform impact assessments and the development of Cultural Management Plans (CMPs) (and other relevant management plans) that may be required.

This framework has been developed to ensure compliance with all relevant environmental and heritage legislation (Commonwealth and State). In addition to these legislations, relevant charters and guidelines were also considered in developing this framework.

The underlying principles of Fortescue's Cultural Values Management Framework are to:

1. Identify the cultural values to Native Title holders within and surrounding a Project or development area (the Project)
2. Identify the potential risks and / or threats to those values that may result from Fortescue's activities
3. Undertake the relevant studies / investigations to determine the level of impact (direct, indirect, and cumulative) to those values and assess the significance of that impact
4. Develop appropriate management strategies to avoid or minimise impacts to those values within high-risk areas



5. Establish an ongoing consultation framework for the implementation and review of cultural heritage management strategies in relation to the Project.

To provide guidance on when the required baseline data and assessments should be undertaken or when key consultation should occur to inform studies and assessments, a staged approach has been developed for Fortescue's Social Surrounds Consultation process. A staged approach ensures adequate data and inputs are collected at key points in the process to inform approval submissions, develop management strategies, and reduce impacts on Project schedules where possible. Consultation undertaken for the Proposal with Traditional Owners has been undertaken in line with this framework.

9.4.2.2 Social Surrounds Consultation

Consultation with the Palyku and Nyiyaparli native title stakeholders was facilitated through their representative bodies, PJAC and KNAC. Consultation on the Proposal commenced in early 2023 where the Fortescue decarbonisation strategy and Proposal concept was first introduced at PJAC and KNAC board meetings. A summary of consultation with native title stakeholders in relation to the Proposal is provided in Table 4-2.

Since then, Fortescue has engaged PJAC and KNAC to facilitate heritage surveys and TEK surveys (outlined in Table 9-2), and on-country social surrounds consultation (outlined in Table 9-3) to understand the social, cultural, and heritage values within, and surrounding the DE.

The social, cultural, and heritage values identified during social surrounds consultation trips and heritage surveys are described in Sections 9.4.2.3 to 9.4.2.7.



[This page has been left blank intentionally]



Table 9-3: Summary of On-Country Social Surrounds Consult Trips

Consultation Trip			Summary of Consultation
Palyku			
Social Trip 1	Surrounds	Consult	<p>Date of consultation trip: 24 – 28 June 2024.</p> <p>Purpose of consultation trip:</p> <p>Discuss and introduce the Proposal and identify key environmental features / attributes of social, cultural, or heritage value important to Palyku in the area that may be impacted by the Proposal and understand any concerns held by Palyku regarding the Proposal.</p> <p>Field visits were undertaken at the direction of Palyku and included helicopter flights over the proposed turbine, transmission line and associate infrastructure footprint; a visit the Nullagine Iron Ore Project; a visit to Bonnie Pool; and driving the alignment of the proposed PTP8 transmission line following Nullagine Mine Haul Road to Palyku’s native title boundary.</p> <p>Outcomes of consultation trip:</p> <p>During the trip, Palyku raised concerns about potential visual impacts of the wind turbines on the cultural landscape for Palyku and other groups who live locally and travel along Marble Bar Road to and from Nullagine. Concerns regarding potential impacts to water ways and catchment flows, groundwater levels and quality, and impacts to birds’ flight patterns were also discussed. Palyku consider the wind project will have significant impact on the cultural values of Bonnie Pool, mesas and other places of significance in the cultural landscape.</p> <p>As a result of the social surrounds trip, Palyku requested:</p> <ul style="list-style-type: none"> • Subsequent on-country consultation between PJAC Board and Elders (where possible) • Fortescue to consider the use of augmented reality to consult on potential visual impacts • Continued access to Bonnie Pool and Fortescue to maintain an access road to the pool • Avoid crossing creeks if possible, otherwise design the project to minimise the number of creek crossings
Social Trip 2	Surrounds	Consult	<p>Date of consultation trip: 31 – 3 April 2025.</p> <p>Purpose of consultation trip:</p> <p>The primary purpose of this consult was to present on changes made to the project alignment to address concerns / requests made by Palyku during Trip 1 and update Palyku on the outcomes of environmental and social surroundings studies. This consult also informed Palyku of the proposed management strategies that will be considered in the ERD.</p> <p>Field visits were undertaken at several locations to discuss proposed creek crossings, view the augmented reality images, and hear the noise demonstration. Locations visited included:</p> <ul style="list-style-type: none"> • Bonnie creek crossing to further refine Palyku’s approach and preference to creek crossings and land clearances. • Bonnie Pool: undertake noise demonstration and present outcomes of the VIA. Fortescue addressed previous concerns raised by Palyku that two turbines were too close to Bonnie Pool and confirmed that these two turbines have been removed.



Consultation Trip	Summary of Consultation
	<ul style="list-style-type: none">VIA locations along haul road from Bonnie Pool / Nullagine Iron Ore Project to Christmas Creek mine, and Bonney Downs Homestead. <p>Outcomes of consultation trip:</p> <ul style="list-style-type: none">Palyku raised concerns about potential loss of access to hunting areas and possible disturbance of traditional food sources (animals) due to noise generated from the wind turbines.Palyku reiterated their preference to minimise disturbance to water throughout the project area and acknowledged that minimising the number of creek crossings (as requested during Trip 1), would increase the total disturbance footprint, which was acceptable. <p>Key recommendations from Trip 2 included:</p> <ul style="list-style-type: none">Continued consultation between Fortescue, PJAC Board, and representatives,Fortescue to consider senior members of Palyku to visit a working wind farm,Completion of TEK surveys,No transmission poles to be located within creeks and water flows to be as undisturbed as possible,Creek crossings to be either low level floodways or box style culverts,Continued access to Bonnie Pool, andMinimise dust emissions.
Niyaparli	
Social Surrounds Consult Trip 1	<p>Date of consultation trip: 17 – 18 September 2024.</p> <p>Purpose of consultation trip:</p> <p>Discuss and introduce the Proposal and identify key environmental features / attributes of social, cultural, or heritage value important to Niyaparli in the area that may be impacted by the Proposal and understand any concerns Niyaparli may have regarding the Proposal.</p> <p>This trip included travelling along the proposed transmission line within Niyaparli country and visiting several locations along the Marble Bar Road and of importance to Niyaparli where the wind turbines may be visible to understand concerns about potential impacts to visual amenity.</p> <p>Outcomes of consultation trip:</p> <p>Niyaparli representatives requested the proposed transmission line be kept to the west of the existing Nullagine Mine Haul Road within Niyaparli country and that surface water flow is maintained. No concerns were raised about noise or dust during construction or operation of the project. However, Niyaparli requested notification of any closures of BC Iron Road during construction as they use</p>



Consultation Trip	Summary of Consultation
	<p>this road to access the surrounding area for hunting. Soda Spring was also identified as a location used by Niyaparli on occasion for camping and were interested in knowing whether the turbines would be seen from this location.</p> <p>While no specific concerns were raised about potential impacts to culturally significant flora or fauna, Niyaparli were interested in receiving the outcomes of environmental surveys for the project area once completed and requested information sheets summarising these surveys to be provided through KNAC.</p>



[This page has been left blank intentionally]



Heritage Places

A search of the DPLH Aboriginal Cultural Heritage Inquiry System (ACHIS) was undertaken on 10 April 2025, to identify any Registered Sites and Lodged Places within the DE (DPLH, 2024). A search of ACHIS assists in identifying Heritage Places that may have been identified through heritage surveys conducted by third party proponents, allowing a full understanding of the potential heritage values in the area. The search identified 34 Registered Places and 84 Lodged Places within the DE (Appendix L), which are shown on Figure 9-1. Three of the lodged places are classified as gender restricted (only men) located off the Marble Bar Road and are not intersected by the IDF.

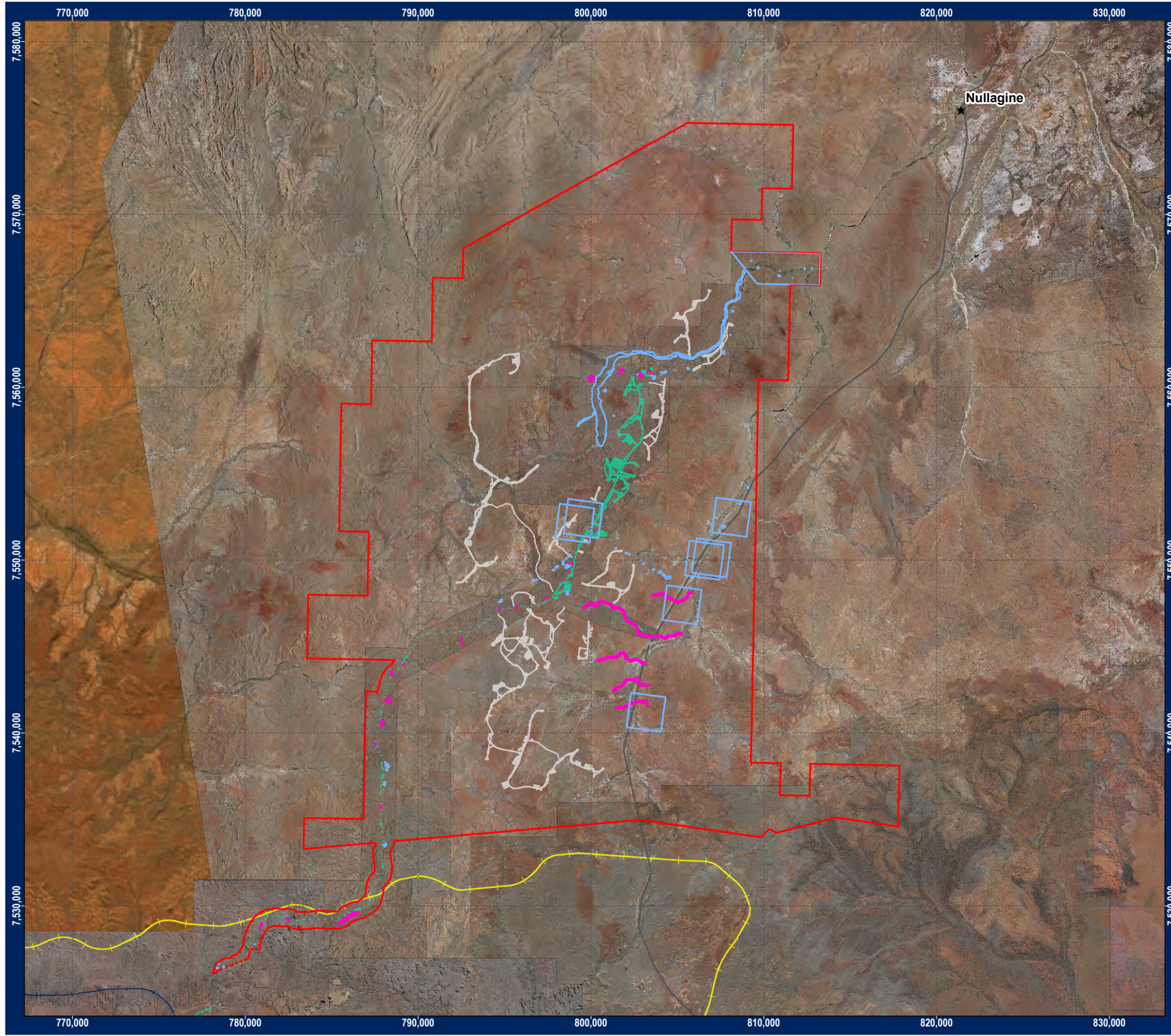
A search of Fortescue's internal heritage database system was also undertaken. Based on surveys completed at the time of writing this report, a total of 158 Heritage Places are located within the DE (Table 9-4).

Table 9-4: Fortescue Heritage Places within the Development Envelope

Number of Sites	Site Type
87	Artefact Scatter
12	Artefact Scatter, Quarry
9	Water Source
8	Artefact Scatter, Water Source
6	Grinding Patch
5	Ethnographic Site
5	Rock Shelter
5	Scar Tree
3	Engraving
2	Camp Site; Engraving; Water Source; Scar Tree; Grinding Patch
2	Ochre Quarry
2	Quarry
2	Rockshelter, Grinding Patch, Ochre Quarry
2	Water Source, engravings
1	Artefact Scatter, Quarry, Water Source
1	Artefact scatter; quarry; grinding
1	Artefact Scatter; Rock Shelter
1	Ethnographic Site, Water Source
1	Named Place
1	Rock shelter, artefact scatter
1	Rockshelter, Scarred Tree
1	Scar Tree; Water Source



[This page has been left blank intentionally]



- Legend**
- ▭ Development Envelope
 - ★ GOV Towns
 - Major Roads
 - Fortescue Rail
 - Roy Hill Rail
 - ▭ Indicative Disturbance Footprint
 - ▭ Approved Disturbance (Nullagine Pilot Wind Farm)
 - ▭ DPLH Places - Registered
 - ▭ DPLH Places - Lodged

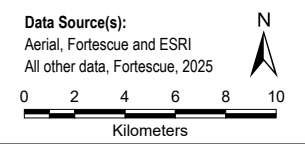


Figure 9-1
 Registered and Lodged
 Aboriginal Heritage Sites

Requested By: R. Dorji
 Drawn By: R. Kerr
 Revised By: rykerr
 Approved By:
 Scale: 1:300,000
 Coordinate System: GDA 1994 MGA Zone 50
 Project Name: 4519OP002_MP_EN_0093_PartIV_3
 Document Name: 4519OP002_MP_EN_0093_029a_r0_Heritage

Date: 1/29/2026
 Size: A4L
 Revision: 0
 Confidentiality: 0

Fortescue accepts no liability and gives no representation or warranty, express or implied, as to the information provided including its accuracy, completeness, merchantability or fitness for purpose.





[This page has been left blank intentionally]



9.4.2.3 Heritage Restriction Zones

Heritage Restriction Zones (HRZs) refer to a defined area that has been identified by Fortescue and or Traditional Owners to contain social, cultural, or heritage values that require specific restriction.

Restrictions applied to HRZs may include (but are not limited to):

- Limitations or restrictions on access requirements,
- Limitations on the types of works that may be undertaken within the HRZ boundary, and
- Requirement for further consultation to appropriately record cultural values contained within the HRZ area.

HRZs are an internal management measure implemented by Fortescue to provide an additional layer of protection for places of cultural significance. HRZs are areas where activities (that may include ground disturbing works) may be permitted in accordance with any relevant management strategies and conditions that have been put in place, and/or agreed between Fortescue and the Native Title stakeholders. These management strategies may include condition to exclude all activities including pedestrian access. Additional HRZs may be applied over previously identified Heritage Places to ensure that any ground disturbing works within that HRZ are compliant with relevant heritage approvals applicable to that Heritage Place.

To date, seven HRZs (Figure 9-2) are present in the Palyku section of the DE, which were identified through consultation with Palyku and also during heritage surveys (Table 9-5). These HRZs include undefined areas the Palyku Native Title stakeholders considered with potential to have cultural value. These HRZs will be subject to additional visitation to record and classify as Aboriginal Sites to be managed under the AH Act, or may remain as HRZs, managed in direct consultation with Palyku Native Title stakeholders.

There are no HRZs present within the Nyiyaparli section of the DE.

Table 9-5: Heritage Restrictions Zones within Palyku section of the DE

HRZ_ID	HRZ Type	Restriction Type	Description	Related Site ID (where applicable)
HRZ-0695				
HRZ-1277				
HRZ-1440				
HRZ-1680				



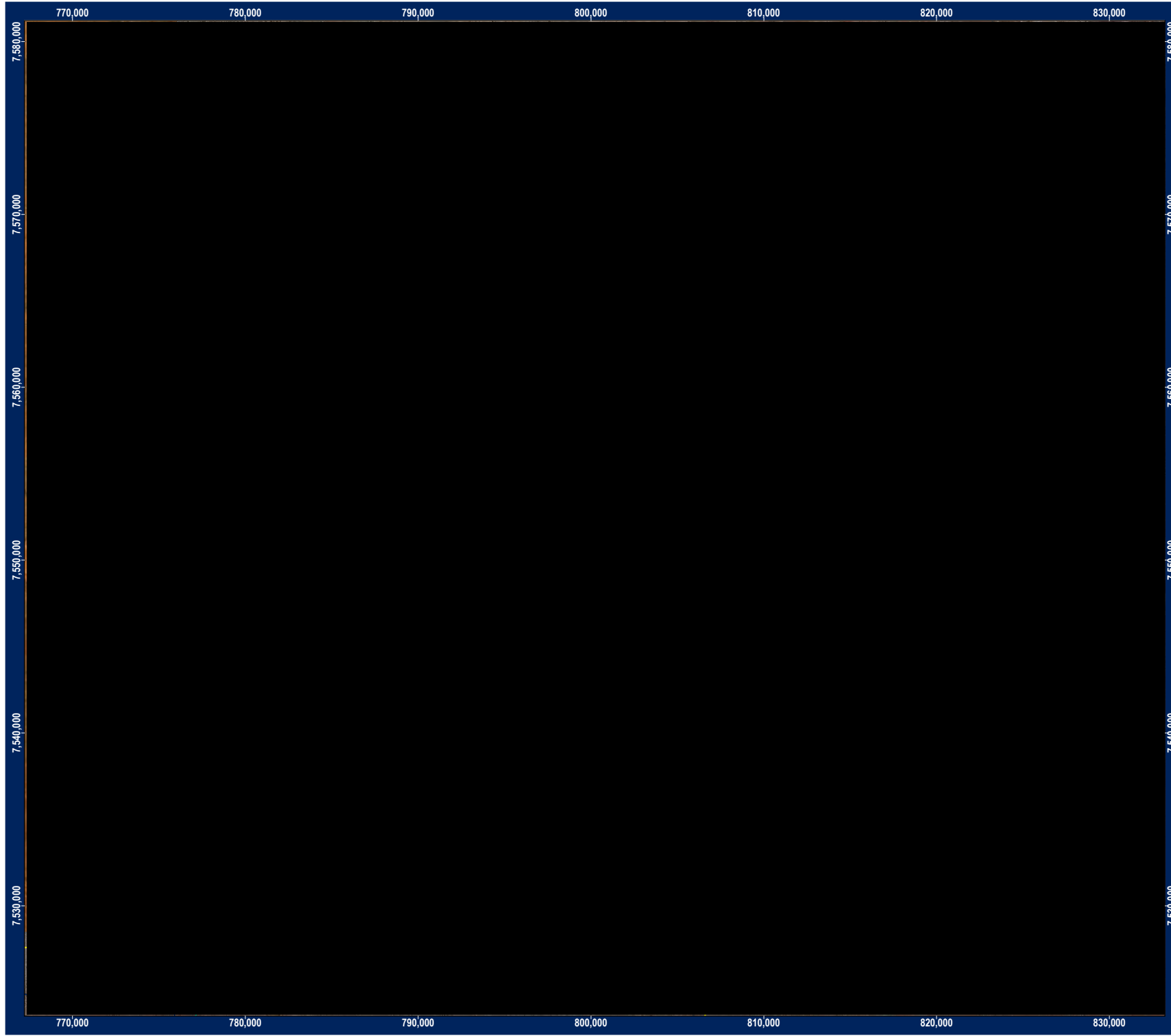
HRZ-1723

HRZ-1736

HRZ-1737



[This page has been left blank intentionally]



- Legend**
- Development Envelope
 - GOV Towns
 - Major Roads
 - Fortescue Rail
 - Roy Hill Rail
 - Indicative Disturbance Footprint
 - Approved Disturbance (Nullagine Pilot Wind Farm)
 - Heritage Restriction Zones

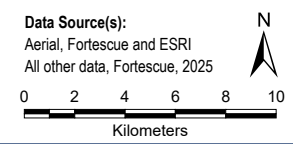


Figure 9-2
 Heritage Restriction Zones

Requested By: R. Dorji Date: 1/29/2026
 Drawn By: R. Kerr Size: A4L
 Revised By: rykerr Revision: 0
 Approved By: Confidentiality: 0
 Scale: 1:300,000
 Coordinate System: GDA 1994 MGA Zone 50
 Project Name: 4519OP002_MP_EN_0093_PartIV_3
 Document Name: 4519OP002_MP_EN_0093_029b_r0_HRZ
 Fortescue accepts no liability and gives no representation or warranty, express or implied, as to the information provided including its accuracy, completeness, merchantability or fitness for purpose.



7,580,000
7,570,000
7,560,000
7,550,000
7,540,000
7,530,000



9.4.2.4 Culturally Significant Water Sources

The DE is located in the headwater areas of four river systems, being the Shaw River, Fortescue River, Nullagine River and Coongan River. The main watercourses that drain through the DE include the Nullagine River to the east, Bonnie Creek (a tributary of Nullagine River) to the north and Coongan River to the west. A number of pools, including Bonnie Pool are found along Bonnie Creek.

Through consultation, Fortescue recognises that water sources are an important cultural value to both Palyku and Nyiyaparli Peoples with water being linked to traditional and spiritual values and vital to health of Country. A request was made by both native title groups to ensure water sources (in general) were protected by minimising disturbance to creeklines and ensuring water flow is maintained.

While no specific water sources were identified by Nyiyaparli as being of particular cultural significance within the DE, Palyku identified two water sources of high cultural significance which are discussed below.

Bonnie Creek Tributary

During both on-country consults, Palyku highlighted the importance of Bonnie Creek from a cultural and environmental perspective. The Bonnie Creek Tributary has been recorded as an ethnographic site (PAL24-153) due to its importance as a travel route for Palyku people (both in the past and today), connections to camping and hunting areas, and ceremonial/dreaming stories. The ecosystems associated with the Bonnie Creek Tributary also add to its cultural value of this water course, providing a range of valuable traditional food and medicinal resources.

Today, Palyku use Bonnie Creek Tributary to undertake hunting, fishing, camping, and other recreational activities such as swimming. Therefore, maintaining the integrity of the water way, its water quality and flows, and its supporting ecosystems is of utmost importance to Palyku.

Bonnie Pool

Located within the Bonnie Creek Tributary, Bonnie Pool is another culturally significant water source within the DE. Recorded as ethnographic site PAL24-007, Bonnie Pool was identified during both on-country consults as a place still used today for camping and hunting activities (Plate 9-1). As Palyku also requested access to Bonnie Pool to be maintained during the life of the project so they could continue to undertake traditional activities here, Bonnie Pool meet the criteria as a 'cultural receptor'.

Ensuring continue access and use of Bonnie Pool for camping and hunting activities is important to Palyku and any impacts to the water quality, water flow, or supporting ecosystems by the Proposal would be an impact to the cultural values associated with this place.



Plate 9-1 Bonnie Pool

During social surrounds Trip 2, several other locations were identified as containing water sources. However, as the values of these places are associated more with being potential camping and hunting areas, these locations are discussed in relation to their aesthetics and amenity values under Section 9.4.2.5.

9.4.2.5 Traditional Ecological Values

Traditional ecological values are another aspect of Social Surroundings that plays an important role in Palyku and Niyaparli culture and traditional practices. This includes culturally significant plants and animals used for bush tucker, tools or medicine, areas used for traditional activities such as camping and hunting, as well as important ecological features with cultural associations.

During consultation on the Proposal, both Palyku and Niyaparli expressed concern regarding potential impacts to native plants and animals in the area. In addition to maintaining the natural biodiversity of the area, which was noted by both groups as being important, Palyku also expressed concern for potential loss of plants used for traditional purposes (such as medicine).

While TEK surveys with Palyku are still ongoing, a survey undertaken recently identified a more detailed list of culturally significant plant and animal species. A total of 31 culturally significant plants and 16 culturally significant animals have been identified within the DE in the Palyku Native Title Determination Area (Appendix M).



No culturally significant plants or animals were identified by Nyiyaparli during consultation, however Nyiyaparli's People and Country Plan (KNAC, 2022) identifies culturally important animals and plants that may occur within the Proposal area. The information from the social surrounds consult aligns with the values that Nyiyaparli have identified through their People and Country Plan (KNAC, 2022).

Fortescue has undertaken a number of flora and fauna assessments for the Proposal (see Chapters 7 and 8) to provide context in the ecological environment of the Proposal.

9.4.2.6 Aesthetics and Amenity

During the Social Surroundings consultations, considerations for potential impacts from changes to the visual aesthetics of the area and amenity (use of country) from noise or dust generated by Fortescue's activities were discussed with Palyku and Nyiyaparli. Based on an understanding of key values in the area, Fortescue proposed locations for inclusion in the dust, noise, and visual impact assessments.

Most of the locations used in the dust, noise, and visual impacts assessments were general locations (or points of interest (POIs)) to understand the potential impacts across the entire area. This approach assists Traditional Owners to narrow down specific locations of concerns, especially where there is general use of the wider area. Where specific receptors were relevant, these were included.

Only 16 cultural receptors (Figure 9-5) were identified during social surrounds consults:

- Bonnie Pool (Palyku) as a location used for camping and hunting practices,
- Cookindina Pool (Palyku) as a location that may be used for camping and hunting practices,
- 4 Mile Well (Palyku) as a location that may be used for camping and hunting practices,
- Emu Spring / Well (Palyku) as a location that may be used for camping and hunting practices,
- Daylight Rockhole (Palyku) as a location that may be used for camping and hunting practices,
- 18 Mile Pool and Warrabu Site (Palyku) as a location that may be used for camping and hunting practices,
- Mooringinya Spring (Palyku) as a location that may be used for camping and hunting practices,
- Coobinacoola Pools (Palyku) as a location that may be used for camping and hunting practices,
- Minderungumya Hill (Palyku) as a location that may be used for camping and hunting practices,
- Bronzewing Pool (Palyku) as a location that may be used for camping and hunting practices,



- Trig Hill Well (Palyku) as a location that may be used for camping and hunting practices,
- Corkbark Spring (Palyku) as a location that may be used for camping and hunting practices,
- Wild Dog Spring (Palyku) as a location that may be used for camping and hunting practices,
- Tundununya Soak (Palyku) as a location that may be used for camping and hunting practices,
- Cattle Well (Palyku) as a location that may be used for camping and hunting practices, and
- Soda Springs (Niyaparli) for VIA to show visual impact from this location.

As discussed, the Proposal has been significantly reduced since the technical assessments were completed. As a result, several of the cultural receptors selected (particularly those in the northern part of the DE), are now located farther from the Proposal elements (Figure 9-5) than they were at the time of assessment.

Two additional visual locations were chosen by Fortescue along the Nullagine Mine Haul Road (VIA_L and VIA_K) as POIs. These two locations were close to Niyaparli heritage places and chosen to assist in consultation with Niyaparli regarding potential visual amenity impacts if these places were visited.

Noise

Noise was considered a potential impact to Palyku's ability to hunt and camp on country. Bonnie Pool was identified as a place used by Palyku for camping and hunting practices. Additionally, Palyku identified several broad hunting areas they use within the DE and surrounding area. Noise monitoring locations were selected across the DE including near Bonnie Pool. Noise modelling results are discussed in Section 9.7.1.4.

No specific areas or places of noise sensitivity were identified during consultation with Niyaparli as no concerns were raised regarding noise generated from the wind turbines.

During consultation, both Palyku and Niyaparli confirmed they used the area within and surrounding the DE for cultural and recreational purposes, and requested the ability to maintain access to continue practicing these traditional activities. Access to Country is discussed further in Section 9.4.2.7.

Visual

Maintaining the aesthetics of the natural landscape and important cultural landscapes within and surrounding the Proposal was identified as a key value by Palyku and Niyaparli. Potential visual impacts on the use of cultural places were also considered regarding maintaining visual amenity and use of country. The VIA assessed potential impacts to both Bonnie Pool (Palyku) and a location close to Soda Springs (Niyaparli).



To address Palyku feedback provided during the June 2024 social surrounds consult (Trip 1) on visual impacts, the Proposal IDF was revised to remove two wind turbines initially located close to Bonnie Pool (VIA_B). The Proposal has also been designed to ensure turbines will not be located on hills or mesas which could increase their visibility within the landscape. Outcomes of the VIA were presented to Palyku during the March 2025 social surrounds consult (Trip 2) through the use of augmented reality application.

During the September 2024 social surrounds consult, Nyiyaparli was presented with images of what the proposed project layout would look like on country through the use of augmented reality. For much of Nyiyaparli country, the landscape provides a natural barrier preventing the wind turbines being seen along the Nullagine Mine Haul Road and the proposed transmission line (part of the Nullagine pilot wind farm). In addition to the POIs chosen by Fortescue, Nyiyaparli identified Soda Springs as a place they visit regularly while hunting and camping in the area and were curious as to whether the wind turbines would be seen from this location. The visual assessment for Soda Springs was undertaken using the images from VIA_I.

Since the September 2024 social surrounds consult, the Proposal has been significantly reduced. As a result, several of the cultural receptors selected during the social surrounds consults (particularly those in the northern part of the DE), are now located farther from the Proposal elements. Given that the redesign involves a reduction in turbine numbers and IDF extent, the absence of further discussion with Nyiyaparli and Palyku regarding these changes is not considered problematic.

Dust

Fortescue commissioned GHD to complete a dust assessment (GHD, 2025) for the Proposal. Dust has the potential to impact on visual amenity and consequently aesthetics of the area. The main source of dust emissions from the Proposal will be highest during the construction phase (GHD, 2025). Fortescue consider that any impacts from dust emissions on the enjoyment or use of country for traditional activities will be temporary and isolated in proximity to the source of the activity, posing more of a short-term impact and nuisance rather than a significant impact.

One cultural receptor, Bonnie Pool, was identified as having potential for impacts from dust emissions. This is discussed further in Section 9.7.1.4.

9.4.2.7 Access to Country

Maintaining access to country and specific places to undertake traditional activities is a native title right afforded to Traditional Owners under the *Native Title Act 1993*. Both Palyku and Nyiyaparli practice traditional activities on their respective lands.

During consultation, Palyku noted several broad areas used for hunting that intersect the DE. Six land types were associated with the hunting areas identified by Palyku and included:

- Hills and ranges with spinifex grasslands,
- Plateaux, mesas and breakaways with spinifex grasslands,
- Stony plains and hills with spinifex grasslands,
- Stony plains with spinifex grasslands,



- Stony gilgai plains with tussock grasslands and spinifex grasslands, and
- River plains with grassy woodlands and shrublands, and tussock grasslands.

Bonnie Pool was identified as a specific place that Palyku currently access for camping while hunting in the area and requested access to the pool is maintained during construction and operation of the Proposal.

Nyiyaparli did not identify any specific places within the DE that they currently use, or would like to maintain access to. However, Nyiyaparli did state that they use the Nullagine Mine Haul Road to access the surrounding areas and expressed their desire to maintain access to this road.

Fortescue acknowledged during social surrounds consultation with both groups that access to the area would not be restricted during operations and that all existing tracks would have the same accessibility as they do now. It is expected that areas may be restricted during construction for safety reasons. However, these restrictions will be temporary and isolated to where construction is occurring. Access to Bonnie Pool will not be impacted during construction or operation of the Proposal.

9.4.3 Non-Aboriginal Heritage

Database searches were undertaken to identify non-Aboriginal heritage values relevant to the Proposal. One heritage value was identified within the DE from a search of the inHerit Database: Bonney Downs Homestead and Log Cabin (Place Number 00820).

The Bonney Downs Homestead and Log Cabin consists of two buildings surrounded by verandahs, of which, the Log Cabin was constructed in 1910, and the homestead was built around 1933 (Figure 9-4). They have aesthetic, historic and social heritage values. The design of the Bonney Downs Homestead is typical of many Pilbara homesteads, and it was constructed using methods no longer practised. Bonney Downs Homestead is classified by the National Trust and is on the Register of the National Estate (Government of WA, 2017).

There are no World Heritage or Commonwealth Heritage listed places within the DE.



9.4.4 Amenity

9.4.4.1 Noise and Vibration

Fortescue engaged Talis Consultants (Talis) (2024a) to undertake a noise assessment of the potential noise impacts from the Proposal, including construction and operational activities, on surrounding areas. This noise assessment is summarised in this document and provided in Appendix N.

The noise sensitive receptors considered in this assessment include:

- Bonney Downs Homestead, and
- The town of Nullagine.

A total of 15 cultural receptors were identified for the noise assessment by Palyku as potential camping areas that may be impacted by noise generated from the Proposal:

- Bonnie Pool,
- Cookindina Pool,
- 4 Mile Well,
- Emu Spring / Well,
- Daylight Rockhole,
- 18 Mile Pool and Warrabu Site,
- Mooringinya Spring,
- Coobinacoola Pools,
- Minderungumya Hill,
- Bronzewing Pool,
- Trig Hill Well,
- Corkbark Spring,
- Wild Dog Spring,
- Tundununya Soak,
- Cattle Well.

As discussed, several of the cultural receptors selected (particularly those in the northern part of the DE), are now located farther from the Proposal elements than they were at the time of assessment.



Activities which have noise related value (e.g. Camping, Hunting, and Ceremonial use) are not defined in the Noise Regulations. There is also a lack of previous information and proxy data to inform the assessment, and to determine the appropriate noise target criteria.

To establish reasonable noise target levels for the different noise sensitive activities, Talis (2024) considered the EP Act and Australian Standard AS2107. Neither the Noise Regulations nor AS2107 has specifications regarding traditional activities such hunting. However, recommendations from the EPA for a cumulative level of 50dBA to assess noise impacts for recreational users of Hearson’s Cove on the Burrup Peninsula is used as a precedent for receptors that are outside of the definition of sensitive receivers (EPA Bulletin 1077).

Based on the identified values, three activities were considered in this assessment and appropriate target noise levels and threshold noise levels were established as described in Table 9-6: Table 9-6 and Table 9-7. These activities included:

- Camping (at night): Noise could result in sleep disturbance and annoyance,
- Hunting: It is expected that hunting will only take place during daylight hours where the hunter uses visual cues. Night-time hunting is not expected, and
- Day use / Ceremonial use: Speech intelligibility and annoyance needs to be considered for activities undertaken during the day or ceremonial use.

The potential noise impacts from Wind Turbine Generators (WTG) have been assessed against the criteria defined in the South Australian Wind Farms environmental noise guidelines (EPA, 2009). These guidelines have been endorsed by the WA EPA and the Western Australian Planning Commission (WAPC) (see Planning Bulletin 67 [8]). The South Australian guideline states that the predicted equivalent noise level (LAeq,10min), adjusted for tonality in accordance with these guidelines, should not exceed:

- 35 dB(A) at relevant receivers in localities, which are primarily intended for rural living, or
- 40 dB(A) at relevant receivers in localities in other zones, or
- The background noise (LA90, 10min) by more than 5 dB(A).

Table 9-6 describes the proposed target noise levels and threshold levels adopted for the Proposal for noise sensitive activities undertaken at cultural receptors. Table 9-7 describes the threshold noise level for noise sensitive receivers.

Table 9-6: Activity Based Noise Target Levels (Talis, 2024)

Activity	Target Noise Level (dB(A))	Threshold Level (dB(A))*	Comment
Camping (night-time)	30	50	The night-time target levels are based on avoiding noise induced sleep disturbance and annoyance. The threshold levels adopted is based on the EPA’s cumulative level of 50dBA to assess noise impacts for recreational users that are outside of the definition of sensitive receivers (EPA Bulletin 1077).



Activity	Target Noise Level (dB(A))	Threshold Level (dB(A))*	Comment
Hunting (daytime)	45		The daytime hunting target levels are based on the assigned levels in the Noise Regulations and assume that the hunter uses visual cues during the day (whereas the hunter is more dependent on auditory cues during night). The threshold levels adopted is based on the EPA's cumulative level of 50dBA to assess noise impacts for recreational users that are outside of the definition of sensitive receivers (EPA Bulletin 1077).
Daytime use / Ceremonial	45		The target levels are based on avoiding annoyance. It should be noted that these levels are set for activities where speaking to others is involved. The threshold levels adopted are based on AS2107 levels for educational buildings. The threshold levels adopted is based on the EPA's cumulative level of 50dBA to assess noise impacts for recreational users that are outside of the definition of sensitive receivers (EPA Bulletin 1077).

* At locations that fall outside of the definition of sensitive receivers (as defined in Environmental Regulations), a precedent from Hearson's Cove has been used (EPA 2002).

Table 9-7: Noise Regulation Assigned Noise Level

Receiver	Threshold Noise Level (LAeq, 10min)/ Rural Receiver Limit (For Windfarms)
Sensitive Receiver	
Bonney Downs Homestead	35
Nullagine Town	
Proposed Bonney Downs Camp	40
Cultural Receptor	
Bonnie Pool	50
Cookindina Pool	
4 Mile Well	
Emu Spring / Well	
Daylight Rockhole	
18 Mile Pool and Warrabu Site	
Mooringinya Spring	
Coobinacoola Pools	
Minderungumya Hill	
Bronzewing Pool	
Trig Hill Well	
Corkbark Spring	
Wild Dog Spring	
Tundununya Soak	



Receiver	Threshold Noise Level (LAeq, 10min)/ Rural Receiver Limit (For Windfarms)
----------	--

Cattle Well

To develop an understanding of the baseline noise levels within the area, Talis (2024) undertook baseline noise monitoring. Eight¹² monitoring locations were selected within the DE, widespread over the entire area. The identified sensitive receptors and noise monitoring locations are shown in Figure 9-5 and Figure 9-6.

Table 9-8 provides a summary of the baseline noise results at each monitoring location, separated into day (7am to 7pm), evening (7pm to 10pm) and night (10pm to 7am). The noise parameter LA90 which is the noise level that is present for 90% of time has been used. Baseline noise varied over the DE:

- Daytime: 30 – 57 dB(A)
- Evening: 20 – 31 dB(A)
- Night: 19 – 32 dB(A)

Table 9-8: Baseline Noise Monitoring Results Summary (Talis, 2024)

Monitoring Location	Description of surrounding area	Time of Day	Average LA90
BD_NM_02 (near Bonnie Pool)	Slightly hilly, low lying sparse shrubs	Day	32
		Evening	20
		Night	19
BD_NM_03	Dense low-lying shrubs	Day	48
		Evening	26
		Night	26
BD_NM_04 (near Bonney Downs Homestead)	Hilly, low lying sparse shrubs	Day	35
		Evening	31
		Night	32
BD_NM_05	Flat, Low lying mild amount of shrubs.	Day	38
		Evening	27
		Night	27
BD_NM_06	Slightly hilly, low-lying shrubs.	Day	30
		Evening	25
		Night	26
BD_NM_07	Hilly, shrubs.	Day	57
		Evening	27
		Night	29
BD_NM_08	Dense trees, shrubs.	Day	55

¹² Noise monitor BD_NM_01 only recorded a partial dataset due to a technical fault. Therefore, this data has been omitted from noise monitoring results



Monitoring Location	Description of surrounding area	Time of Day	Average LA90
		Evening	26
		Night	26

Temporary vibrations will occur mainly due to construction activities including operation of construction plant and machinery, earthworks and general ground disturbing activities. Blasting is an uncommon activity in terms of the construction and operation of a wind farm.

Additionally, Fortescue engaged Talis Consultants (Talis 2025) to undertake potential noise impacts on culturally significant fauna including kangaroos, emus, and echidnas. The study was commissioned to address the Palyku Traditional Owners' concern that continuous turbine noise could mask predator sounds, and also may alter animal behaviour, potentially driving these culturally important species away and reducing access to traditional food sources. The study quantified the received noise levels for each species, evaluated behavioural, communication, and physiological effects, and used noise modelling and risk mapping to estimate disturbance and masking risks. This fauna noise impacts study is provided in Appendix O.

9.4.4.2 Visual Amenity

The EPA objectives relevant to visual and landscape impacts are those regarding the protection of social surroundings, and specifically the protection of social surroundings from harm (EPA, 2023b). This includes protecting modifications to sensitive viewsheds and changes to landscape amenity.

Given the difference in visual and landscape considerations for wind turbines compared to other structures such as solar farms and electrical infrastructure, Section 6.1 of Planning Bulletin 67 of the WAPC (WAPC, 2007) has been used to inform this assessment. This document states that:

“The degree to which a wind farm development will impact on the landscape will depend on:

- *Siting, layout and design of the turbines, infrastructure, signage and ancillary facilities, including provision for tourism.*
- *Number, colour, shape, height and surface reflectivity of the towers and blades.*
- *Visibility of the development, having regard to the location, distance from which the development is visible, skyline and viewsheds.*
- *Significance and sensitivity of the landscape, having regard to topography, the extent and type of vegetation, natural features, land use patterns, built form character and community values.*

Methods to ameliorate visual impact include:

- *Ensuring turbines look alike, have a clean, sleek appearance and that the blades rotate in the same direction.*



- *Minimising the number of turbines, as appropriate, by using the largest possible model (subject to the visual absorption capabilities and environmental considerations of the site) rather than numerous small ones.*
- *Siting the wind farm, ancillary buildings, access roads and transmission infrastructure to complement the natural landform contours and landform backdrop, including ridgelines.*
- *Ensuring the choice of materials and colour (e.g. off-white and grey for turbines, low contrast for roads) for the development complements the skyline and the backdrop of the view sheds.*
- *Minimising removal of vegetation and using advanced planting of vegetation screens as visual buffers where appropriate.*
- *Ensuring good quality vegetation and landform rehabilitation, on-site and off-site, where appropriate.*
- *Locating turbines to reflect landscape and topographical features (e.g. a random pattern may suit a rolling, varied landform and a linear pattern may suit a coastal edge, farm or industrial site).*
- *Avoiding clutter, such as advertisements and apparatus.”*

The Landscape and Visual Impact Assessment (SLR, 2024b) is provided in Appendix P.

Visual Landscape Evaluation

A landscape study undertaken by the former Department of Conservation and Land Management (CALM, 1994) classified WA landscapes into broad Landscape Character Types (LCT). The Proposal is located within the Nullagine Hills LCT. This LCT is variable, characterised by a gradual spinifex plain and rugged hills dissected by drainage lines at an elevation of 160-480 m Australian Height Datum (AHD). The land surface elevation where the wind turbines are proposed, ranges from 450 – 500 m AHD (Geoscience Australia, 2010).

A Landscape Character Unit (LCU) is a smaller unit than an LCT, providing information on the variations within the LCT at a local scale. The LCUs were identified based on Land Systems, vegetation mapping, aerial imagery and a site visit. The final LCUs were chosen based on a visual landscape character preference and in the context of their rarity in the Study Area. The DE was characterised into the following five LCUs (SLR, 2024b), as shown on Figure 9-3:

- Plains (LCU 1): characterised by a stony, clayey or sandy plain with mix of blue sky, various hues of green / brown vegetation, and ochre to pale earth,
- Ranges, hills and low rises (LCU 2): is mostly rounded hills or slopes, ochre earth, contrasting mix of blue sky, various hues of green/ brown vegetation,
- Major waterways and drainage lines (LCU 3): characterised by plains or hills surrounding pools (or sandy riverbeds), flood plains, tall trees and a contrasting mix of blue sky and various hues of green, brown, and sometimes white vegetation,



- Mining and infrastructure (LCU 4): Dominated by non-natural surfaces of built form and the disturbed or bare soils of various colours, often with vegetation in the foreground or background, and
- Townsites and residential (LCU 5): Dominated by non-natural surfaces of built form and the disturbed or bare soils of various colours, often with vegetation in the foreground or background. The Bonney Downs Homestead was the only area within the DE classified as LCU 5.

Impacts associated with visual amenity are related to how an individual or group perceives and uses an area. Thirteen viewpoints were identified by Fortescue for the Proposal based on principles for potential use of the area and in consultation with Traditional Owners. Given the limited public access to the majority of the DE, the relevant receptors for this assessment are predominately related to the Traditional Owner and Pastoralist use of the area. Several points along Marble Bar Road were chosen for general public receptors. A total of 13 viewpoints were assessed for the Proposal. As mentioned previously, the Proposal has been significantly reduced since the technical assessments were completed. As a result, several of the viewpoints selected (particularly those in the northern part of the DE), are now located farther from the Proposal elements than they were at the time of assessment.

Visual Management Objectives

The WAPC Visual Landscape Planning in Western Australia: A manual for evaluation, assessment, siting, and design (2007) adopts three broad Visual Management Objectives (VMOs):

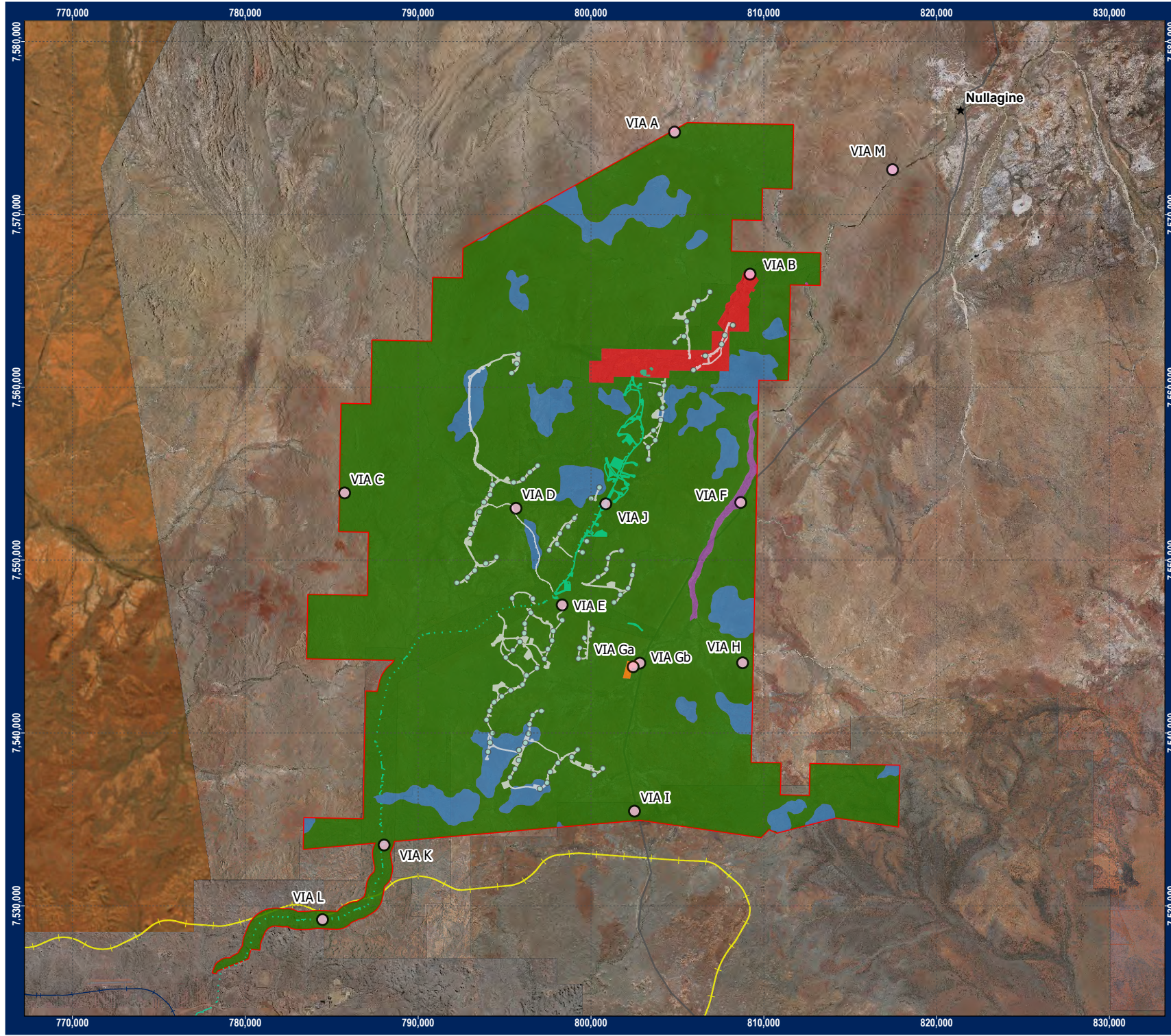
- Best practice siting and design,
- Protection and enhancement, and
- Restoration of degraded character or enhancement opportunities.

The VIA (SLR 2024b) adopted the following project-specific VMOs:

- The Project should not result in a dominant change in view for moderate to high sensitivity viewpoints that are located > 1 km from the Project Area,
- The Project should not result in a significant modification to the visual catchment, turbines may be visually apparent and become a major element in the landscape but should not dominate the existing visual catchment, and
- Minimise the impact of the Project that results in the removal or visual alteration/disruption of key landscape features.



[This page has been left blank intentionally]



- Legend**
- | | |
|--|----------------------------------|
| Development Envelope | Landscape Character Units |
| GOV Towns | Mining and Infrastructure |
| Major Roads | Plains |
| Fortescue Rail | Ranges, hills and low rises |
| Roy Hill Rail | River system |
| Indicative Disturbance Footprint | Townsites and Residential |
| Approved Disturbance (Nullagine Pilot Wind Farm) | |
| Turbine Locations | |
| VIA Viewpoints | |

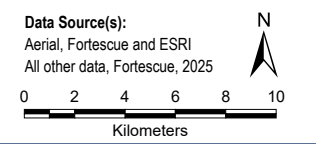


Figure 9-3
 Landscape Character Units
 and VIA Viewpoints

Requested By: R. Dorji
 Drawn By: R. Kerr
 Revised By: rykerr
 Approved By:
 Scale: 1:300,000
 Coordinate System: GDA 1994 MGA Zone 50
 Project Name: 4519OP002_MP_EN_0093_PartIV_3
 Document Name: 4519OP002_MP_EN_0093_030_r0_Landscape

Date: 1/30/2026
 Size: A4L
 Revision: 0
 Confidentiality: 0

Fortescue accepts no liability and gives no representation or warranty, express or implied, as to the information provided including its accuracy, completeness, merchantability or fitness for purpose.





[This page has been left blank intentionally]



9.4.4.3 Dust

Fortescue engaged GHD (2025) to undertake a dust assessment related to potential impacts of dust deposition. This report is provided in Appendix Q, with outcomes of the assessment discussed in Section 9.6.1.6.

The Pilbara is recognised as having elevated dust levels, higher than other areas in Western Australia (Government of Western Australia, 2025). An aggregated emission inventory for the Pilbara was undertaken by SKM (2000) for the 1999/2000 financial year. This study calculated that approximately 170,000 tonnes of dust were emitted as a result of wind erosion and approximately 195,000 tonnes from wildfires. Other sources of dust include:

- Dust entrainment due to vehicle movements along unsealed public roads,
- Episodic emissions from prescribed and controlled burning as well as wildfires,
- High wind events,
- Local agricultural/pastoral activities, and
- Dust emissions from iron ore moved along private railways.

Two sensitive receptors were identified for dust emissions including:

- Bonnie Pool (cultural receptor), and
- Bonney Downs Homestead.

9.4.5 Economic Activity

The Pilbara region's economy is dominated by the mining industry, accounting for 88% of total economic output. The region's iron ore and liquefied natural gas industries represent more than 70% of the mineral and energy production in Western Australia. These industries continue to grow in the region (Pilbara Development Commission, 2024). The DE is adjacent to the Christmas Creek Iron Ore Mine Expansion DE (MS 1033) and overlaps the Nullagine Iron Ore Mine (Fortescue).

Additional operational mines within 50 km of the DE include Cloudbreak and Christmas Creek mines (Fortescue), Marillana Agate, McPhee Creek and Roy Hill Iron Ore (DMIRS, 2024).

9.4.6 Towns and Population Centres

The Proposal is located in a large-scale landscape setting in a remote area of the east Pilbara. The nearest towns are Nullagine and Marble Bar which are approximately 10 km northeast and 80 km north of the DE, respectively. According to the 2021 Census, Nullagine has approximately 147 individuals of 33 families, while Marble Bar has similar population, with 153 individuals of 53 families (ABS, 2021).

9.4.7 Recreation and Tourism

Tourism in the Pilbara region is driven by the area's unique and globally recognised natural features, alongside activities related to mining, construction, and business travel (DPIRD, 2024). This sector is viewed as a vital avenue for economic diversification in the region (Kelley,



2005). The Pilbara's natural environment supports a range of outdoor tourism activities, including camping, boating, and fishing (Pilbara Development Commission, 2024).

Key locations that may be used for recreation and tourism includes the Nullagine townsite, Bonnie Pool and Marble Bar road. Marble Bar road is the main access road between Newman, Marble Bar and Port Hedland.

9.4.8 Pastoral

The majority of the DE (93.37%) is situated in pastoral leases across the Bonney Downs, Hillside and Roy Hill pastoral leases. Bonney Downs pastoral lease represents 85.14% (76,600.53 ha) of the DE, while Hillside represents 8.23% (7,409.19 ha) and Roy Hill represents 0.06% (55.81 ha).

Bonney Downs homestead is located within the DE, while the homesteads for Hillside and Roy Hill are outside of the DE. Given the limited overlap with Hillside and Roy Hill pastoral leases they will not be discussed further in this assessment.

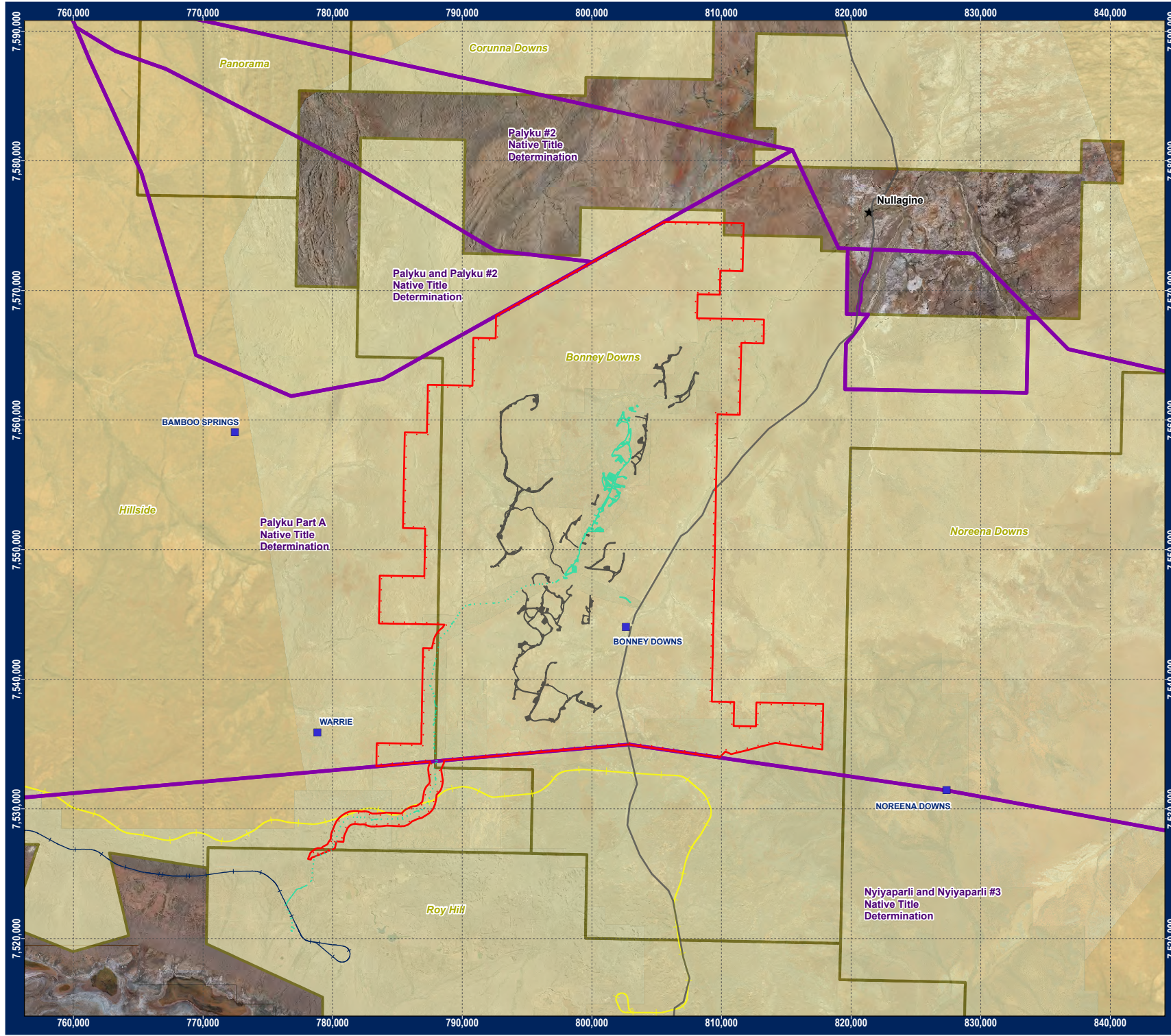
The Bonney Downs pastoral lease (3114/1208) covers an area of approximately 373,621 ha of which 20.50% overlaps the DE. Fortescue has engaged with the Bonney Downs Station owner on the environmental approval process and Proposal timelines (see Section 4.2). In the absence of any information from the station owner on sensitive receptors, Fortescue has assumed that values important to the owner include:

- Visual impact of the Proposal from the homestead;
- Noise and dust emissions at the homestead; and
- The ability to continue to run a profitable business.

Figure 9-4 shows the location of the towns and surrounding social setting, and Figure 9-5 shows cultural receptors and other receptors within and outside of the DE.



[This page has been left blank intentionally]



- Legend**
- ▭ Development Envelope
 - ★ GOV Towns
 - Homesteads
 - Major Roads
 - Fortescue Rail
 - Roy Hill Rail
 - ▭ Indicative Disturbance Footprint
 - ▭ Approved Disturbance (Nullagine Pilot Wind Farm)
 - ▭ Pastoral Leases
 - ▭ Native Title Determination

Data Source(s):
 Aerial, Fortescue and ESRI
 All other data, Fortescue, 2025

N

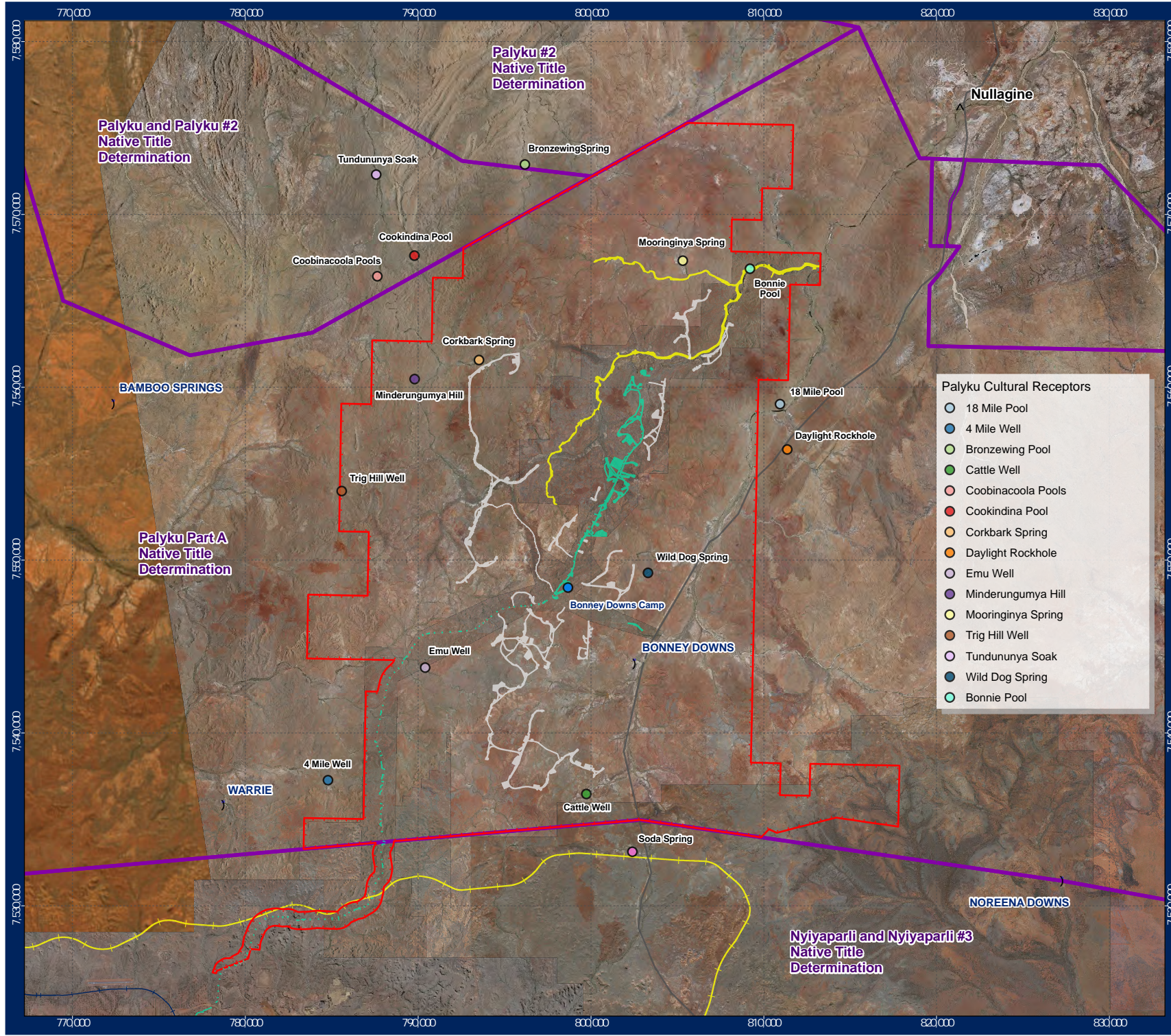
0 2 4 6 8 10
 Kilometers

Figure 9-4
Social Setting and Land Use
 Associated with the Development Envelope

Requested By: R. Dorji	Date: 1/30/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 0
Approved By:	Confidentiality: 0
Scale: 1:400,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV_3	
Document Name: 4519OP002_MP_EN_0093_031_r0_LandUse	

Fortescue accepts no liability and gives no representation or warranty, express or implied, as to the information provided including its accuracy, completeness, merchantability or fitness for purpose.





- Legend**
- Development Envelope
 - ^ GOV Towns
 -) Homesteads
 - Major Roads
 - Fortescue Rail
 - Roy Hill Rail
 - Indicative Disturbance Footprint
 - Approved Disturbance (Nullagine Pilot Wind Farm)
 - Bonnie Creek
 - Native Title Determination
 - Nyiyaparli Cultural Receptor
 - Soda Spring
 - Receptors
 - Bonney Downs Camp
 -) Bonney Downs Homestead
 - ^ Nullagine Town

- Palyku Cultural Receptors**
- 18 Mile Pool
 - 4 Mile Well
 - Bronzewing Pool
 - Cattle Well
 - Coobinacoola Pools
 - Cookkindina Pool
 - Corkbark Spring
 - Daylight Rockhole
 - Emu Well
 - Minderungumya Hill
 - Mooringinya Spring
 - Trig Hill Well
 - Tundununya Soak
 - Wild Dog Spring
 - Bonnie Pool

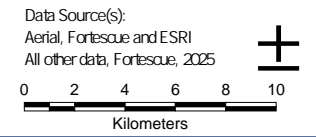


Figure 9-5
Cultural Receptors and
Other Receptors

Requested By: R. Dorji Date: 2/2/2026
 Drawn By: R. Kerr Size: A4L
 Revised By: rykerr Revision: 1
 Approved By: Confidentiality: O
 Scale: 1:300,000
 Coordinate System: GDA 1994 MGA Zone 50
 Project Name: 45190P002_MP_EN_0093_PartIV_3
 Document Name: 45190P002_MP_EN_0093_032_r1_Receptors
 Fortescue accepts no liability and gives no representation or warranty, express or implied, as to the information provided including its accuracy, completeness, merchantability or fitness for purpose.





[This page has been left blank intentionally]



9.5 Potential Impacts

9.5.1 Aboriginal Cultural Heritage and Cultural Values

The potential direct and indirect impacts from the Proposal on Aboriginal Cultural Heritage and Cultural Values are outlined in Table 9-9 and Table 9-10.



[This page has been left blank intentionally]



Table 9-9: Potential Direct and Indirect Impact on Palyku Cultural Values from the Proposal

Theme/Topic	Concerns/Queries raised by Traditional Owners	Potential Impact	Potential consequence
Direct Impacts			
Heritage Places	<ul style="list-style-type: none"> • Unauthorised disturbance to Heritage Places and objects within the DE. • Unauthorised access by Fortescue personnel and contractors. 	<ul style="list-style-type: none"> • Removal or damage to cultural material, including engravings and grinding materials. 	<ul style="list-style-type: none"> • Loss of cultural information and connection to ancestors. • Potential breach of AH Act (WA) for unauthorised impact to heritage sites.
Plants & Animals	<ul style="list-style-type: none"> • Concern expressed about bird collision with turbine and expected increase in feral animals • General concern expressed about native plants and animals, and maintaining the overall biodiversity of the area. • Avoid disturbance to mesas, identified by Palyku as a place of important animal habitat. 	<ul style="list-style-type: none"> • Loss native birds and bats or changes to migratory patterns • Loss of biodiversity of native plant and animal species. • Inability to access areas for traditional activities (e.g. resource gathering / hunting). 	<ul style="list-style-type: none"> • Loss of culturally significant animals and plants used for traditional purposes (e.g. medicine, bush tucker, hunting)
Water	<ul style="list-style-type: none"> • General concerns on impact on waterways and flows from springs, river and creek catchments, waterholes and creeks. • Impacts on water sources perceived to have been impacted by Nullagine Iron Ore Project. • Disturbance to Bonnie Pool. 	<ul style="list-style-type: none"> • Disturbance to creek lines or banks from proposed crossings or widening of existing tracks over creeks. • Loss of Bonnie Pool. 	<ul style="list-style-type: none"> • Loss of healthy waterways and Country. • Potential breach of AH Act (WA) for unauthorised impact to heritage sites (where water sources are recorded as Heritage Places).
Indirect Impacts			
Dust	<ul style="list-style-type: none"> • General concern around dust emissions from the Proposal. 	<ul style="list-style-type: none"> • Increased dust from construction and operation reducing aesthetics at culturally significant areas and the wider cultural landscape. 	<ul style="list-style-type: none"> • Loss of enjoyment of country. • Loss of culturally significant animals and plants used for traditional



Theme/Topic	Concerns/Queries raised by Traditional Owners	Potential Impact	Potential consequence
		<ul style="list-style-type: none"> Decline of plant health for culturally significant flora in high-risk areas. 	<ul style="list-style-type: none"> purposes (e.g. medicine, bush tucker, hunting).
Visual amenity	<ul style="list-style-type: none"> Request to keep infrastructure (turbines, poles) off mesas and hills. Being able to see wind turbines from Bonnie Pool 	<ul style="list-style-type: none"> Reduced aesthetics at culturally significant areas and wider cultural landscape. No longer use or visit the area to undertake traditional activities. 	<ul style="list-style-type: none"> Loss of natural landscape and connection to Country and culture in this area.
Noise and vibration	<ul style="list-style-type: none"> Vibration from operating wind turbines affecting native animals. Excessive noise levels impacting ability to undertake traditional activities at Bonnie Pool or surrounding areas 	<ul style="list-style-type: none"> Reduced use of the area for traditional activities due to noise from construction. Permanent loss of access to areas for traditional activities due to noise from operation. Noise and Vibration from operating wind turbines resulting in altered animal behaviour (discussed further in Chapter 10: Terrestrial Fauna). 	<ul style="list-style-type: none"> Loss of connection to Country and culture in this area.
Access to Country	<ul style="list-style-type: none"> Maintain access to the development area. Maintain access to Bonney Downs area as a place used for camping and hunting. 	<ul style="list-style-type: none"> Reduced use of the area or inability of access the area for traditional activities resulting in loss of connection to Country and cultural practices. 	<ul style="list-style-type: none"> Loss of connection to Country and culture in this area.
Water	<ul style="list-style-type: none"> Impacts to water flow and quality of rivers, Bonnie Pool and creek lines. 	<ul style="list-style-type: none"> Altered hydrological regime of rivers and creek lines impacting health of waterways and natural characteristics. 	<ul style="list-style-type: none"> Loss of healthy waterways and Country. Cultural responsibility for downstream impacts on neighbouring language group Country.



Table 9-10: Potential Direct and Indirect Impact on Nyiyaparli Cultural Values from the Proposal

Theme/Topic	Concerns/Queries raised by Traditional Owners	Potential Impact	Potential consequence
Direct Impacts			
Heritage Places	<ul style="list-style-type: none"> Unauthorised disturbance to Heritage Places and objects within the DE. Unauthorised access by Fortescue personnel and contractors. 	<ul style="list-style-type: none"> Removal or damage to cultural material, including engravings and grinding materials. 	<ul style="list-style-type: none"> Loss of cultural information and connection to ancestors. Potential breach of AH Act (WA) for unauthorised impact to heritage sites.
Plants & Animals	<ul style="list-style-type: none"> General concern expressed about native plants and animals, and maintaining the overall biodiversity of the area. 	<ul style="list-style-type: none"> Reduction in biodiversity of plants and animals in the area. 	<ul style="list-style-type: none"> Loss of culturally significant animals and plants.
Water	<ul style="list-style-type: none"> Reduced water quality due to contamination or excess sediment runoff. Reduction of surface water flow in waterways. 	<ul style="list-style-type: none"> Disturbance to creek lines or banks from proposed crossings or widening of existing tracks over creeks. Changes to water quality from unmanaged excess sediment 	<ul style="list-style-type: none"> Loss of healthy waterways and Country.
Indirect Impacts			
Visual amenity	<ul style="list-style-type: none"> Soda Springs to be added as a cultural receptor for potential visual impacts. 	<ul style="list-style-type: none"> Reduced aesthetics at culturally significant areas. No longer use or visit the area to undertake traditional activities. 	<ul style="list-style-type: none"> Loss of natural landscape and connection to Country and culture in this area.
Access to Country	<ul style="list-style-type: none"> Maintain continued access to DE for hunting purposes. 	<ul style="list-style-type: none"> Inability to access areas for traditional activities (e.g. resource gathering / hunting). 	<ul style="list-style-type: none"> Loss of connection to Country and culture in this area.
Water	<ul style="list-style-type: none"> Impacts to water flow and quality of rivers and creek lines. 	<ul style="list-style-type: none"> Altered hydrological regime of rivers and creek lines impacting health of waterways and natural characteristics. 	<ul style="list-style-type: none"> Loss of healthy waterways and Country. Cultural responsibility for downstream impacts on neighbouring language group Country.



[This page has been left blank intentionally]



9.5.2 Non-Aboriginal Heritage

Potential direct impacts from the Proposal on Non-Aboriginal heritage include damage or degradation of Bonney Downs Homestead and Log Cabin from construction and operation of the Proposal.

9.5.3 Amenity

9.5.3.1 Visual Amenity

The Proposal will result in permanent changes to the landscape due to the placement of man-made structures in an otherwise natural landscape.

9.5.3.2 Noise and Vibration

Potential impacts include:

- An increase in noise levels compared to baseline during construction,
- An increase in noise levels compared to baseline during wind farm operations,
- Increased noise levels and human discomfort during construction activities, due to elevated noise levels and ground-borne vibration at Bonney Downs Homestead, and
- Increased noise levels and human discomfort during operations, due to elevated noise levels and ground-borne vibration at Bonney Downs Homestead.
- Noise from the WTG may cause physical injury, behavioural disturbance, and masking effects that impact culturally significant species.

9.5.3.3 Dust

There are potential impacts in relation to the Proposal resulting from dust on Bonney Downs Homestead.

9.6 Mitigation

9.6.1 Aboriginal Cultural Heritage and Cultural Values

Fortescue will work collaboratively with Palyku and Nyiyaparli to outline the management measures that will be implemented by the Proposal to avoid or minimise impacts to social, cultural, and heritage values. Key mitigation measures for cultural values related to Flora and Vegetation and Terrestrial Fauna are outlined in the EMP (Appendix B) and implemented to appropriately manage the potential environment impacts to shared values. Key mitigation for the management of cultural values associated with Inland Waters are outlined in Section 10.1.6.3 and will be implemented to appropriately manage the potential environmental impacts to shared values.

Fortescue is committed to ongoing consultation with Palyku and Nyiyaparli and their representative bodies, PJAC and KNAC, in relation to the construction and operation of the Proposal.



Management measures to address the potential impacts detailed in Section 9.7.1 are provided in Table 9-11.



Table 9-11: Management Measures to Address Potential Impacts on Cultural Values

Mitigation Hierarchy	Impact topic	Mitigation
Avoidance	Heritage Places	<ul style="list-style-type: none"> • Undertake heritage surveys and consultation to identify Heritage Places and areas of cultural significance, • Undertake relevant impact assessments / studies to assess potential impacts as designs plan change (where applicable), • All Heritage Places and Heritage Restriction Zones (HRZs) will be identified in Fortescue's GIS system, • IDF designed to avoid Heritage Places and areas of cultural significance (where practicable), and • Fencing of Heritage Places in proximity to proposed works (where required) or demarcation of LUC activity area in accordance with Fortescue's Heritage LUC Demarcation Procedure (100-GU-HE-0010). • <i>Aboriginal Cultural Heritage Act 1972</i> can regulate direct disturbance (e.g. clearing) to heritage places.
	Water	<ul style="list-style-type: none"> • Culturally significant water sources are recorded in Fortescue's GIS system as Heritage Places or HRZs, and • IDF designed to avoid Bonnie Pool. • <i>Aboriginal Cultural Heritage Act 1972</i> can regulate direct disturbance (e.g. clearing) to water values for cases where these are considered heritage places.
	Plants and Animals	<ul style="list-style-type: none"> • Areas of culturally significant flora and fauna are recorded in Fortescue's GIS system as Heritage Places or HRZs, • Culturally significant plants or animals which require ongoing management to be included in environmental management plan, and • Implementation of mitigation measures outlined in Chapters 7 and 8.
	Aesthetics and Amenity	<ul style="list-style-type: none"> • Heritage Places or areas of cultural significance that are dust, noise, visual, or vibration sensitive will be recorded as such in Fortescue's GIS system.
	Access to Country	<ul style="list-style-type: none"> • Areas requiring access to undertake traditional activities are recorded in Fortescue's GIS system as Heritage Places or HRZs, • Access to Bonnie Pool, creeks and tributaries is maintained, and • Access to Nullagine Mine Haul Road and surrounding area is maintained.
Minimisation	Heritage Places	<ul style="list-style-type: none"> • Relevant Heritage conditions applied to Land Use Certificates (LUCs) prior to undertaking works in the DE,



Mitigation Hierarchy	Impact topic	Mitigation
		<ul style="list-style-type: none"> • Undertake Heritage LUC Audits during construction phase and ground disturbing activities (as required), • All personnel mobilised to site to undertake general and site-specific inductions regarding Fortescue's heritage management procedures, • Undertake blasting activities in accordance with Fortescue's Blasting Near Heritage Place Procedure (100-PR-HE-0003), and • Where required, seek heritage approvals under relevant heritage legislation in consultation with Palyku and Nyiyaparli.
	Water	<ul style="list-style-type: none"> • Proposal designed to minimise impacts to creeks by reducing the number of creek crossings and utilising existing crossings where practical, • Where creek crossings are required to provide connectivity to the turbines within the DE, they are designed to: <ul style="list-style-type: none"> ○ Utilise existing access tracks where possible, ○ Minimise impacts to heritage sites, ○ Maintain flow continuity and prioritise using floodways where possible, ○ Reduce disturbance footprint in watercourses, ○ Minimise gradient of road entry and exit points at crossing locations, • Pole locations located outside of high flow areas, where required to be installed within rivers, as far as possible, • Turbine locations to avoid major watercourses and associated 1% AEP floodplain area, • Turbine hardstand areas and supporting infrastructure to be positioned outside of noted flood prone areas • Turbine access track designed to minimise crossings of major watercourses and flow paths, and • Implementation of a construction surface water and sediment management plan throughout the construction phase (see Section 10.1.6).
	Plants and Animals	<ul style="list-style-type: none"> • Ensure consultation with PJAC and KNAC regarding potential impacts to culturally significant plants or animals. • Establish appropriate criteria / thresholds for managing areas of culturally significant plants or animals in high-risk areas, that might be identified (where existing management strategies or procedures may not apply), and



Mitigation Hierarchy	Impact topic	Mitigation
		<ul style="list-style-type: none"> • Clearing of land kept to a minimum to reduce potential loss of traditional flora species and culturally significant fauna habitat.
	Aesthetics and Amenity	<ul style="list-style-type: none"> • Implement general dust management protocols (as discussed in Section 7.7.2.6) to minimise dust generated from Fortescue activities in accordance Fortescue Dust Management Plan / Procedure, and • The Proposal has been designed to ensure turbines will not be located on hills or mesas.
	Access to Country	<ul style="list-style-type: none"> • Ensure consultation with PJAC and KNAC regarding Decommissioning Plan (where required), • Notifications for road closures will be provided to PJAC and KNAC during construction or maintenance activities, and • Access protocol to be developed with Palyku Traditional Custodians for continued access to Bonnie Pool.
Rehabilitation	Plants and Animals / Aesthetics	<ul style="list-style-type: none"> • Rehabilitation of a total of 480.81 ha (this includes 13.94 ha of areas previously cleared by other activities not related to this Proposal) will be undertaken progressively after each phase of the construction activities to reduce impacts to flora and vegetation over time, including potential fragmentation. This will be undertaken in accordance with Fortescue's standard procedures including Rehabilitation and Revegetation Monitoring Procedure (Reference: 45-GU-EN-0009) provided in Appendix D.



[This page has been left blank intentionally]



9.6.2 Non-Aboriginal Heritage

As discussed in Section 9.7.2, no residual impacts from the Proposal are expected on non-Aboriginal heritage including Bonney Downs Homestead and Log Cabin. Therefore, no mitigation measures are required.

9.6.3 Amenity

9.6.3.1 Noise and Vibration

As discussed in Section 9.7.3.1, there is potential for noise levels to exceed legislated thresholds at the Bonney Downs Homestead. Fortescue is committed to mitigating noise exceedances at the Bonney Downs Homestead through the implementation of appropriate mitigation measures including potential modifications to the IDF design, such as the removal of turbines near the homestead, and/or the operational adjustment of wind farm turbines to ensure noise levels remain within the prescribed thresholds during operation. Once these mitigation measures are in place, significant noise impacts on Bonney Downs Homestead are not anticipated.

Mitigation measures related to culturally significant fauna species are provided in Section 9.6.

Vibration resulting from operation of turbines is anticipated to be very low level and likely to be experienced in the immediate vicinity of the turbine.

9.6.3.2 Visual Amenity

As discussed in Section 9.7.3.2, no significant residual visual or landscape impacts from the Proposal have been identified with regard to social surroundings. Therefore, no mitigation measures are proposed.

9.6.3.3 Dust

As discussed in Section 9.7.3.3, no residual dust impacts from the Proposal have been identified to date. Dust deposition will be managed through standard construction management measures (e.g., water application and exposed surface stabilisation) to minimise dust generation and avoid impacts on social surroundings. The following standard dust mitigation measures will be implemented throughout construction phase:

- Use of dust suppression to manage dust generation from construction activities, access roads and cleared areas,
- Use of water sprays to manage dust generation from material transport and stockpiling,
- Limit the number and height of stockpiles, and
- Vehicles confined to designated routes with speed limits strictly enforced.

9.7 Assessment of Impacts

9.7.1 Aboriginal Cultural Heritage and Cultural Values

Assessment of the potential impacts detailed in Section 9.5 is provided below.



9.7.1.1 Heritage Places

Unauthorised removal or damage of Heritage Places and heritage features and unauthorised access to Heritage Places by Fortescue personnel may result in loss of cultural information, loss of connection to ancestors and potential breach of AH Act.

The IDF has been designed to avoid all Heritage Places and HRZs, and minimise impacts to areas of cultural significance (where practicable). If required, Fortescue will seek heritage approvals under the AH Act in consultation with Palyku and Nyiyaparli. **The AH Act process will ensure direct impacts to Heritage Places are avoided or appropriately mitigated** such that significant impacts to Heritage Places from the Proposal are not expected.

9.7.1.2 Water

Fortescue has completed hydrological assessments for the Proposal to evaluate potential impacts on surface water flows and quality, which are discussed further in Section 10.1 (Inland Waters).

Fortescue recognises that water is an important cultural value to both Palyku and Nyiyaparli people. The Proposal has been designed to minimise impacts to creeks (and drainage lines) by adopting the below design criteria:

- Turbine locations to avoid major watercourses and associated 1% AEP floodplain area,
- Turbine hardstand areas and supporting infrastructure to be positioned outside of noted flood prone areas,
- Turbine access track designed to minimise crossings of major watercourses and flow paths.
- Where creek crossings are required to provide connectivity to the turbines within the development, they are designed to:
 - Utilise existing access tracks where possible,
 - Minimise impacts to heritage sites,
 - Maintain flow continuity and prioritise using floodways where possible,
 - Reduce disturbance footprint in watercourses, and
 - Minimise gradient of road entry and exit points at crossing locations.

Palyku raised concerns regarding impacts on groundwater levels for pools within the Proposal area, including Bonnie Pool. Impacts to Bonnie Pool were considered within the GOS (BC-16018-RP-HY-0001) associated with existing DWER licence GWL171278(7), with Bonnie Pool found to be outside the potential zone of influence for impact associated with groundwater abstraction. The current water licence is approved to abstract up to 1.009 GL/yr, which is greater than the needs of the Proposal (maximum of 850 ML/yr).

Both Palyku and Nyiyaparli raised concerns regarding impacts to surface water flow and water quality within the Proposal area and downstream (Table 9-9 and Table 9-10). Based on



feedback received during consultation on the Proposal, the following design changes were implemented:

- Reduction of the total number of major creek crossings,
- Reduction in the size and earthworks required for creek crossings,
- Floodway locations have been prioritised in crossings where possible,
- Redesign of the road network and transmission poles placement away from Bonnie Pool and creek network, and
- Removal of two turbines within 500 m of Bonnie Pool.

Outcomes from the hydrological assessment (Fortescue, 2024b) indicate that the Proposal's impact on surface water flows will be localised, mainly around turbine access tracks and creek crossings, with negligible disruptions to regional flows downstream. The low-level floodway crossings have minor impacts on creek hydrology and morphology, and culverted crossings may alter flow regimes locally but are unlikely to affect areas immediately beyond the structures. This includes the effects on Bonnie Creek, which is not expected to propagate to Bonnie Pool. Through the implementation of a construction surface water and sediment management plan, and standard pollution prevention measures, increases to flood risk and erosion will be minimised and the risk of impacts to water quality will be adequately controlled.

The Proposal may impact surface water quality, potentially leading to poor water quality through activities such as earthworks, transportation of pollutants, treated wastewater, re-fuelling and spills/leaks. Potential impacts from increased sediment loads entering creeks and contamination will be avoided and managed through implementation of surface water mitigation measures (see Section 10.1.6) Therefore, it is unlikely that Proposal activities such as minor earthworks will result in significant impacts.

The hydrological assessment indicates that the potential impacts from the Proposal are expected to be localised, temporary, and are unlikely to result in significant changes to the identified minor and major watercourses (Fortescue, 2025). Furthermore, predicted hydrological changes, including reductions in water depth, are localised and limited to the vicinity of the indicative disturbance area and are not in close proximity to culturally sensitive receptors, including Bonnie Pool.

As such, through the incorporation of design avoidance measures and implementation of mitigation measures, significant impacts to water resources are not anticipated.

9.7.1.3 Plants and Animals

Both Palyku and Nyiyaparli have concerns that the Proposal may result in loss of animal habitats, native (and traditional) plant species, and overall loss of biodiversity within the Proposal area. Both Palyku and Nyiyaparli use the Proposal area for traditional activities such as camping and hunting native animals. Culturally significant species are outlined in Appendix M. Culturally significant species identified during the TEK survey included the Greater Bilby and Pilbara Olive Python, these species are discussed in Chapter 8 (Terrestrial Fauna).

The Greater Bilby and the Pilbara Olive Python were not recorded during the TEK survey, however two records (one within the DE) of Pilbara Olive Python were recorded during the



terrestrial fauna surveys (ecologia, 2025b). The Greater Bilby is not expected to be impacted by the Proposal, as there is a low likelihood of occurrence within the Proposal (refer to Section 8.4.1). A total of 15.87 ha (0.31% of mapped extent in the DE) of Pilbara Olive Python critical habitat will be cleared by the Proposal. However, as the clearing extent equates to less than 1% of the available critical habitat within the DE and there is further suitable habitat in the wider area. Therefore, significant cultural impact is not anticipated for the Greater Bilby or Pilbara Olive Python.

When considering concerns raised around increases in feral species, given the nature of the DE and surrounding area (vast open expanse), it is considered that the Proposal will not significantly increase accessibility to the area for feral animals due to the openness of the current landscape and existing presence of feral animals in the area. Additionally, appropriate waste management will be implemented during construction and operation to ensure food wastes do not increase attraction of feral animals.

The remaining species are not discussed within Chapter 8 (Terrestrial Fauna), as they are common and widespread within the region.

Culturally Significant Flora within Palyku NTD

Thirty-one (31) flora species of cultural significance to the Palyku people have been recorded within the DE in the Palyku NTD area (Appendix M). Only nine species; *Acacia inaequilatera* (2), *Acacia pruinocarpa* (1), *Acacia pyrifolia* var. *pyrifolia* (1), *Aerva javanica* (7), *Capparis spinosa* subsp. *nummularia* (1), *Cucumis melo* (1), *Hakea lorea* subsp. *lorea* (2), *Senna notabilis* (2), and *Vachellia farnesiana* (52) are within the IDF. While these species hold cultural importance, their widespread distribution within Palyku NTD area ensures continued accessibility. As the IDF is limited in extent, it is unlikely to affect the ongoing availability or use of these species by Traditional Owners.

Culturally Significant Flora within Nyiyaparli NTD

No culturally significant plants were identified by Nyiyaparli during consultation, however Nyiyaparli's People and Country Plan (KNAC, 2022) identifies culturally important plants that may occur within the Proposal area. The information from the social surrounds consult aligns with the values that Nyiyaparli have identified through their People and Country Plan (KNAC, 2022). It should be noted that while these species are culturally important, they occur over widespread areas of the Nyiyaparli NTD area.

The clearing of 910.26 ha of native vegetation has the potential to impact plants and animals of cultural significance to the Traditional Owners. The Proposal activities that may impact culturally significant flora and fauna include:

- Vegetation and habitat loss from direct clearing of vegetation in the IDF to accommodate the Proposal infrastructure, including access roads, turbine pads, and substations,
- Fauna mortality and disturbance due to increase vehicle movement during the construction and operational phases,
- Habitat fragmentation and/or behavioural change due to the long-term (~30 years) operation of the wind farm, which includes the turbine movements and operation of the Proposal infrastructure, and



- Behavioural change resulting from disturbance associated with general construction and operational-related activities (i.e., artificial light, noise, increase of human activities).

With regard to the plants recorded in the TEK survey, as detailed in Section 9.4.2.5, during the planning and design process for the Proposal, the mitigation hierarchy (avoid, minimise and rehabilitate) was applied to assess, avoid and minimise potential impacts to flora and vegetation as far as practicable.

The IDF has been designed to avoid areas that may support significant biodiversity values or heritage values, such as avoidance of groundwater dependent and riparian vegetation to minimise disturbance to these vegetation types, as discussed in Chapter 7 (Flora and Vegetation). The flora species of cultural significance recorded in the DE are predominantly all common across the Pilbara region or specifically common through drainage lines or plains which are widespread throughout the DE. The design seeks to avoid major drainage / creek lines except where crossing locations are required. Consultation with Traditional Owners was undertaken to identify creek crossings in order to reduce environmental and heritage impacts.

Additionally, Palyku expressed concern regarding bird collision with turbines, particularly during flocking/migration events which occur cyclically, and the possible increase in feral species that will scavenge on the carrion. This potential impact has been assessed in Chapter 8 (Terrestrial Fauna).

Any disturbance to flora and fauna during construction will be minimised through proposed mitigation measures and standard construction site control measures for noise, lighting, dust and enforcement of speed limits (as discussed in Chapter 7 and 8).

9.7.1.4 Aesthetics and Visual Amenity

Noise and Vibration

Noise and vibration are considered a potential impact to Traditional Owners' ability to enjoy or use Country, and therefore, has the potential to impact traditional activities. Eight locations were selected for baseline noise monitoring for the noise assessment (Talis, 2024).

Construction of the Proposal and the operation of plant and machinery, earthworks and ground disturbing activities will temporarily elevate noise levels. Noise during construction activities is anticipated to remain below the noise threshold levels adopted for cultural receptors, except for Corkbark Spring and Wild Dog Spring (Table 9-12). An access protocol will be implemented for construction works to notify PJAC and KNAC of construction schedules, allowing Palyku and Nyiyaparli to plan their activities in the area accordingly. No significant impacts from construction activities are anticipated given the temporary and localised nature of the proposed activities.

Table 9-12: Noise Model Results (LA10) - Wind Farm Construction

Cultural Receptor	Noise model result LA10 (dB(A))*		Threshold Level (dB(A))
	Clearing	Concreting	
Bonnie Pool	42.5	35.5	50
Cookindina Pool	10.9	4.7	



Cultural Receptor	Noise model result LA10 (dB(A))*		Threshold Level (dB(A))
	Clearing	Concreting	
4 Mile Well	41.0	34.0	
Emu Spring / Well	42.0	36.0	
Daylight Rockhole	20.9	14.3	
18 Mile Pool and Warrabu Site	28.0	22.0	
Mooringinya Spring	40.7	33.6	
Coobinacoola Pools	9.9	3.5	
Minderungumya Hill	29.6	23.6	
Bronzewing Pool	26.5	20.7	
Trig Hill Well	26.0	19.8	
Corkbark Spring	59.5	54.6	
Wild Dog Spring	50.4	45.4	
Tundununya Soak	15.9	8.8	
Cattle Well	47.4	42.3	

***Bold**: refer to threshold exceedances for cultural receptors

Operational noise from the Proposal is anticipated to range from 13 – 55 dB(A) within the DE influenced by wind speed. Noise levels during operations are anticipated to remain below the noise threshold level for all cultural receptors, except for Corkbark Springs when wind speeds exceed 7m/s (Table 9-13). An access protocol will be implemented during operations to allow for PJAC and KNAC to notify of the intent to camp at identified receptors to allow for noise mitigation to be implemented. Given the number of other potential camping locations identified by Palyku in the wider area, this is not considered to be a significant impact to Palyku's ability to undertake traditional activities within the Proposal area.

It should be noted that the Talis (2024) noise assessment modelled up to 200 wind turbines across the DE; however, the current proposal has since been refined to 100 turbines. As a result, any predicted exceedances of noise thresholds may be lower than those reported in the assessment. However, even under the original 200 turbine scenario, no noise impacts were assessed as significant.



Table 9-13: Noise Model Results (LA10) - Wind Farm Operations

Cultural Receptor	Threshold Level (dB(A))	Wind Speed (hub height) *							
		5m/s	6m/s	7m/s	8m/s	9m/s	10m/s	11m/s	12m/s
Bonnie Pool	50	31.7	35.7	39.0	40.6	41.5	41.8	41.8	41.8
Cookindina Pool		14.1	18.1	21.4	23.0	23.9	24.2	24.2	24.2
4 Mile Well		13.9	17.3	20.6	22.3	23.1	23.4	23.4	23.4
Emu Spring / Well		26.5	30.0	33.2	34.9	35.7	36.0	36.0	36.0
Daylight Rockhole		18.9	22.7	26.0	27.6	28.5	28.8	28.8	28.8
18 Mile Pool and Warrabu Site		21.6	25.5	28.8	30.4	31.3	31.6	31.6	31.6
Mooringinya Spring		32.6	36.5	39.8	41.5	42.3	42.6	42.6	42.6
Coobinacoola Pools		20.7	24.6	27.9	29.6	30.4	30.7	30.7	30.7
Minderungumya Hill		25.0	29.0	32.3	33.9	34.8	35.1	35.1	35.1
Bronzewing Pool		19.0	22.9	26.2	27.9	28.7	29.0	29.0	29.0
Trig Hill Well		21.7	25.5	28.8	30.5	31.3	31.6	31.6	31.6
Corkbark Spring		45.0	49.0	52.3	53.9	54.8	55.1	55.1	55.1
Wild Dog Spring		39.1	42.9	46.2	47.8	48.7	49.0	49.0	49.0
Tundununya Soak		12.8	16.7	20.0	21.6	22.5	22.8	22.8	22.8
Cattle Well		35.9	39.8	43.2	44.8	45.7	46.0	46.0	46.0

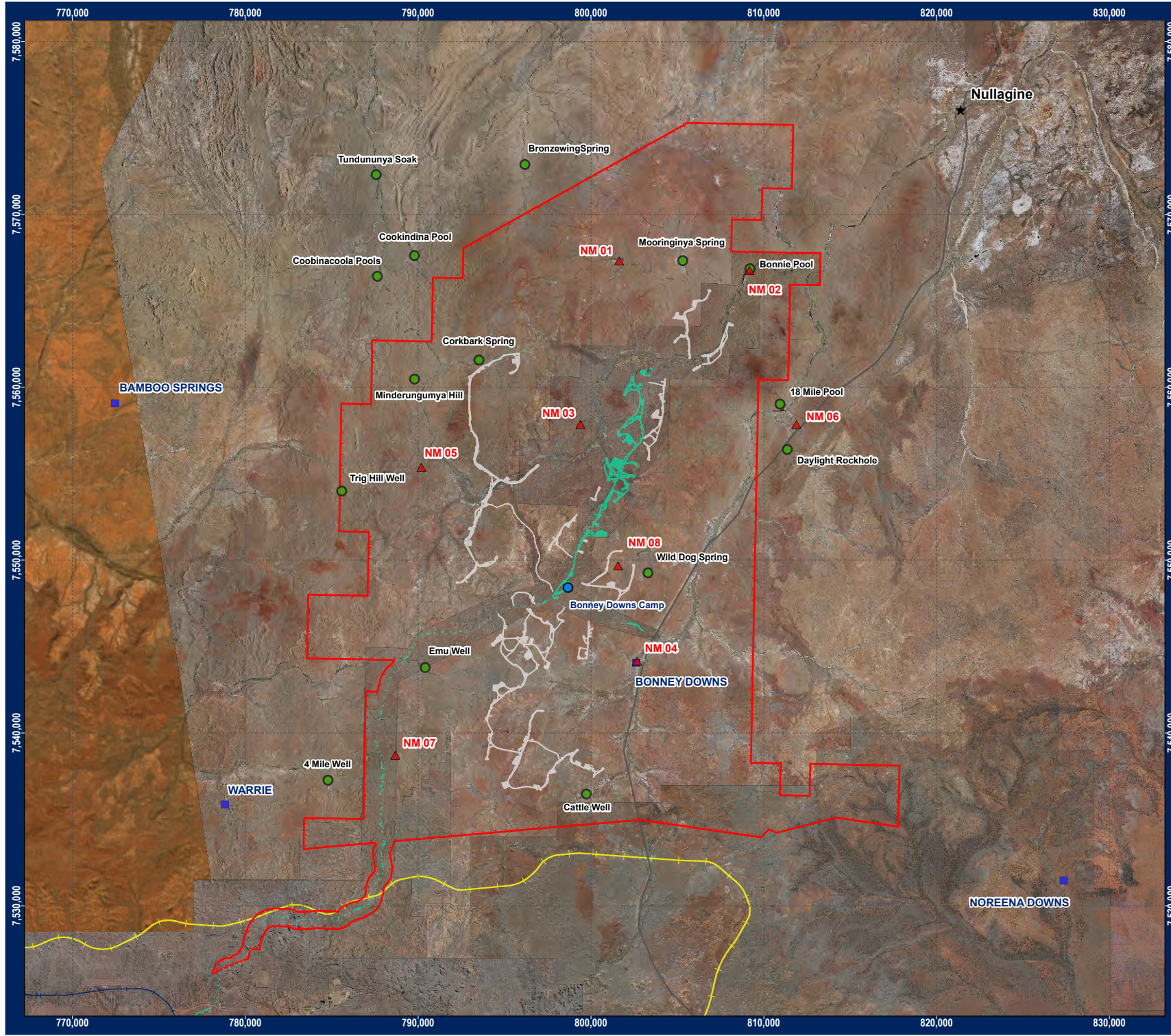
***Bold:** refer to threshold exceedances for cultural receptors

Temporary vibrations will occur mainly due to construction activities including operation of construction plant and machinery, earthworks and general ground disturbing activities. It is not anticipated that a significant amount of blasting will take place. The vibration from construction activities will be temporary and is not expected to significantly impact Aboriginal Cultural Heritage. Any vibration from blasting activities (where undertaken) will be managed under Fortescue’s ‘Blasting Near Heritage Places Procedure’ (100-PR-HE-0003) (this procedure is not included as an appendix to this report due to its confidential nature).

As such, significant impacts to Aboriginal Cultural Heritage and Cultural Values due to noise or vibration are not expected. General noise impacts associated with amenity are discussed further in Section 9.7.3.1.



[This page has been left blank intentionally]



- Legend**
- ▭ Development Envelope
 - ★ GOV Towns
 - Major Roads
 - Fortescue Rail
 - Roy Hill Rail
 - ▭ Indicative Disturbance Footprint
 - ▭ Approved Disturbance (Nullagine Pilot Wind Farm)
 - ▲ Noise Monitoring Locations
 - Palyku Cultural Receptors
 - Receptors
 - Bonney Downs Camp
 - Bonney Downs Homestead
 - ★ Nullagine Town

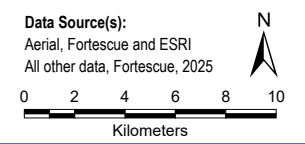


Figure 9-6
 Baseline Noise Monitoring Locations

Requested By: R. Dorji
 Drawn By: R. Kerr
 Revised By: rykerr
 Approved By:
 Scale: 1:300,000
 Coordinate System: GDA 1994 MGA Zone 50
 Project Name: 4519OP002_MP_EN_0093_PartIV_3
 Document Name: 4519OP002_MP_EN_0093_033_r0_Noise

Date: 1/30/2026
 Size: A4L
 Revision: 0
 Confidentiality: 0

Fortescue accepts no liability and gives no representation or warranty, express or implied, as to the information provided including its accuracy, completeness, merchantability or fitness for purpose.





[This page has been left blank intentionally]



Visual Amenity

Maintaining the aesthetics at culturally significant areas and wider cultural landscape within and surrounding the Proposal was identified as a key value by Traditional Owners. Potential visual impacts on the use of cultural places were also considered in regard to maintaining visual amenity and use of country. The VIA for the Proposal considered the following scenarios:

- Before construction (current state),
- During operations,
- After decommissioning, and
- 50-year post decommissioning.

The VIA (SLR, 2025b) concluded that, turbines within the landscape will affect the existing visual character of the area; however, the natural landscape remains dominant. The Proposal will not result in the alteration or disruption to valued landscape characteristics, including rivers, major waterways, or ranges. These key features remain physically unaffected and largely visually unaffected during the operational phase of the Proposal. Given the design changes already made and that Palyku and Nyiyaparli can still access the area to undertake traditional activities and visit cultural places, significant impacts to Aboriginal Cultural Heritage and Cultural Values are not expected. Visual impacts associated with amenity are discussed further in Section 9.7.3.2.

Dust

No specific concerns were raised during consultation with Palyku or Nyiyaparli regarding dust. However, high levels of dust may have an impact on Traditional Owner's ability to enjoy and use specific places within the Proposal area for traditional activities.

Dust emissions are expected to be generated by construction activities, vehicle movements, and wind erosion during the construction phase and during operations from reduced vegetation cover. Nuisance dust could affect dust-sensitive receptors during construction activities, however, will be short term and localised. Dust generation during operations is not anticipated to be significant and localised around cleared areas from infrastructure (GHD, 2025). Potential impacts to Bonnie Pool are not anticipated during construction or operations with implementation of proposed management measures.

Fortescue proposes to manage dust emissions during construction and operations (where required) by implementing the Dust Management Plan (IO-PL-EN-0001, Dust management efforts will primarily be focused during the construction phase, with minimal impacts anticipated during operations. Consequently, dust generation and deposition can be minimised and largely contained within the construction period of the Proposal.

As such, significant impacts to Aboriginal Cultural Heritage and Cultural Values due to dust emissions are not expected. Dust emissions associated with amenity are discussed further in Section 9.7.3.3.



9.7.1.5 Access to Country

Reduced access to Country may result in loss of connection to Country and cultural practices. Both Palyku and Nyiyaparli raised concerns about continued access to the Proposal area for hunting purposes. Palyku identified Bonnie Pool as an importance place used for camping and hunting. Access to Bonnie Pool will be maintained throughout the operation of the Proposal. Temporary access restrictions to Bonnie Pool may occur during construction phase, as will access to the broader area used by Palyku and Nyiyaparli for hunting. Inconveniences from temporary access restrictions during construction will be managed through an Access Protocol, notifying Palyku and Nyiyaparli (through their representative bodies PJAC and KNAC) of construction schedules for the Proposal to plan visiting the area accordingly.

Based on the hunting area locations provided by Palyku during social surrounds consultation, six main land types were identified, of which five occur within the DE and four within the IDF (Table 9-14). The extensive availability of hunting grounds is supported by large areas of suitable land types, which provide suitable access for hunting across Palyku’s Native Title Determination.

While some overlap exists within the DE, the proportion of disturbance remains minimal (Table 9-14). The ‘stony plains and hills with spinifex grasslands’ exhibit a 53.68% overlap with the DE, however only 1.31% of the IDF intersects this land type, suggesting that essential hunting areas will still be accessible.

Additionally, the stony plains with spinifex grasslands (240,285.46 ha) remain entirely undisturbed from the Proposal (Table 9-14), further preserving viable hunting grounds. Given the preference for these land types and their continued availability for access, along with the minimal impact on fauna species (see Chapter 8), suggests that key prey populations will remain stable, supporting ongoing hunting activities. Therefore, hunting practices are unlikely to be significantly affected by the Proposal.

Table 9-14: Hunting Area Land Types

Land Type	Area (ha)			Proportion of Overlap with Palyku Determination (%)	
	Palyku Determination	Development Envelope	Indicative Disturbance Footprint	Development Envelope	Indicative Disturbance Footprint
Hills and ranges with spinifex grasslands	540,744.42	58,437.42	363.59	10.81%	0.07%
Plateaux, mesas and breakaways with spinifex grasslands	68,326.99	4,320.07	44.9	6.32%	0.07%
Stony plains and hills with spinifex grasslands	33,165.51	17,802.21	433.19	53.68%	1.31%
Stony plains with spinifex grasslands	240,285.46	-	-	0.00%	0.00%



Land Type	Area (ha)			Proportion of Overlap with Palyku Determination (%)	
	Palyku Determination	Development Envelope	Indicative Disturbance Footprint	Development Envelope	Indicative Disturbance Footprint
Stony gilgai plains with tussock grasslands and spinifex grasslands	29,524.77	7,469.58	98.54	25.30%	0.33%
River plains with grassy woodlands and shrublands, and tussock grasslands	15,861.70	499.69	-	3.15%	0.00%

Some operational restrictions may apply within close vicinity of wind turbines for the use of firearms for hunting. Access protocols will be discussed and implemented with PJAC and KNAC. As such, a significant impact to Palyku and Nyiyaparli from changes to access to Country is not expected.

9.7.2 Non-Aboriginal Heritage

The DE intersects the current boundary of the Bonney Downs Homestead and Log Cabin; however, it does not overlap with the IDF, being approximately 2.5 km from the nearest disturbance area. Therefore, no direct impacts to Bonney Downs Homestead and Log Cabin are expected. Potential indirect impacts due to noise and vibration, visual amenity and dust are discussed further in Section 9.7.3.

9.7.3 Amenity

9.7.3.1 Noise and Vibration

Noise modelling for construction activities included the simulation of clearing and concreting activities and their related equipment. Operational activities include the wind turbine activities at different speeds. The completed methodology for the noise model is described in Section 4.2 'Noise Model Inputs' of Appendix N.

Three sensitive receivers were identified which include Bonney Downs Homestead, Nullagine townsite and the Proposed Bonney Downs Camp. Bonnie Pool was identified as a cultural receptor for Palyku and is discussed in Section 9.7.1.4.

The noise assessment concluded that none of the sensitive receivers would exceed the assigned threshold levels during construction activities (Table 9-15).



Table 9-15: Noise Model Results (LA10) - Construction

Receiver	Closest WTG Tag Number	Noise model result LA10 (dB(A))*		Threshold (dB(A))	Level
		Clearing	Concreting		
Noise sensitive receivers					
Bonney Downs Homestead	WT106	38.9	33.4	35	
Nullagine Town	WT183	8	<1		
Proposed Bonney Downs Camp	WT068	42.4	37.0	40	

***Bold**: refer to threshold exceedances for cultural receptors

During the operational phase, predicted noise levels remain below threshold levels for Nullagine Town. However, the Bonney Downs Homestead and the Proposed Bonney Downs Camp are anticipated to exceed noise Thresholds (Table 9-16).

Baseline noise monitoring near Bonney Downs Homestead ranged from 35 dBa during the day, 31 during the evening and 32 at night (Table 9-8). In the worst-case modelled scenario, wind turbines may exceed noise threshold levels at the Bonney Downs Homestead when wind speeds exceed 6 m/s and the Proposed Bonney Downs Camp will exceed noise thresholds from 5 m/s (Table 9-16).

Given the average wind speeds of approximately 8 m/s within the DE and a prevailing east-south-east wind direction, operational noise from the wind turbines is expected to be partially masked. At higher wind speeds, the increased sound of wind moving through vegetation further diminishes turbine noise, reducing potential impacts on nearby receptors. Noise modelling is underway to refine design and mitigation strategies for Bonney Downs Homestead, while the Proposed Bonney Downs Camp will be relocated outside the affected area to minimize noise exposure. As a result, noise impacts on nearby receptors during operation are anticipated to be reduced.

Table 9-16: Noise Model Results (LA10) - Wind Farm Operations

Receiver	Threshold Levels	Wind Speed (hub height)*							
		5m/s	6m/s	7m/s	8m/s	9m/s	10m/s	11m/s	12m/s
Noise sensitive receivers									
Bonney Downs Homestead	35	31.0	35.6	38.5	40.2	41.0	41.3	41.3	41.3
Nullagine Town		<5	8.0	12.0	14.5	15.6	15.7	15.7	15.7
Proposed Bonney Downs Camp	40	37.0	42.8	44.5	46.1	46.7	47.2	47.2	47.2

***Bold**: refer to threshold exceedances for cultural receptors

Vibration impacts from blasting are not expected to exceed the thresholds for the Bonney Downs Homestead, Nullagine Town or the Proposed Bonney Downs Camp. Vibration resulting from the operation of turbines is anticipated to be very low level and likely to be experienced only in the immediate vicinity of the turbines.



Culturally Significant Fauna

Talis (2025) was engaged to quantify received noise levels and assess the potential impacts of WTG noise on culturally significant fauna, including kangaroos, emus, and echidnas. Noise from the WTG may potentially impact these species by causing physical injury to their hearing, inducing behavioural changes due to disturbance, or creating masking effects that reduces their ability to hear, communicate, or detect predators.

There is no risk of physical injury to culturally significant fauna from WTG noise; however, there is some potential risk that Kangaroos and Emus may experience reduced ability to hear, communicate, or detect predators in localised areas close to the turbines, particularly at higher wind speeds (Talis 2025). The risk increases between 5 m/s (when turbines start turning) and 10 m/s (when turbines make loudest noise). Beyond 10 m/s, the background noise produced by wind becomes too high, and turbines noise is unlikely to interfere with their ability to communicate or detect predators. Echidnas are not expected to be impacted by the noise.

9.7.3.2 Visual Amenity

Landscape Assessment

The potential impacts on LCUs are summarised in Table 9-17. LCUs 1 to 3 are expected to experience minor to moderate impacts on the landscape, while the remaining LCUs are not anticipated to be affected. This is due to either their low landscape value (LCU 4) or the absence of magnitude of change (LCUs 4 and 5).

The magnitude of change to the landscape character is determined by factors such as the intensity, nature, scale, extent and duration of the impacts, and modification of features within the existing landscape. It is also based on the type of landscape most susceptible to change before the implementation of any mitigation measures.

The impact of the Proposal on landscapes is predicted to be minor-moderate. The overall impact to the landscape is not considered significant, given that the natural LCU occurs widely outside of the DE (SLR, 2024b).

Table 9-17: Landscape Assessment Results (SLR, 2024b)

LCU	Land uses	Landscape Value	Magnitude of Change	Landscape Impact
LCU 1 – Plains	Mineral exploration, pastoralism, and transportation. This landform is also likely used for traditional activities such as hunting and camping by native title holders	Medium	Low	Minor-Moderate
LCU 2 – Range, Hills and low rises	Mineral exploration, pastoralism, and transportation. This landform is also likely used for traditional activities such as hunting and camping by native title holders.	Medium	Low	Minor-Moderate
LCU 3 – Major Waterways and drainage lines	Pastoralism. This landform is also likely used for traditional activities such as hunting and camping by native title holders.	High	Negligible	Minor-Moderate
LCU 4 – Mining and infrastructure	Mineral exploration, mining and pastoralism. This landform may also be used for traditional activities by native title holders.	Low	None	None



LCU	Land uses	Landscape Value	Magnitude of Change	Landscape Impact
LCU 5- Townsites and residential	Dominated by non-natural surfaces of built form and the disturbed or bare soils of various colours, often with vegetation in the foreground or background.	High	None	None

Viewpoint Assessment

Thirteen POIs were selected for the VIA. These POIs are key viewpoints from which the landscape is experienced, and their sensitivity to changes in visual amenity was evaluated to determine potential impacts (SLR, 2024b). As discussed, several of the POIs selected (particularly those in the northern part of the DE), are now located farther from the Proposal elements than they were at the time of assessment. Therefore, the results assess a scenario worse than is, with some of the negative impacts identified likely to be reduced.

Of the 13 POIs, the following are now located farther from the closest turbine than they were previously:

- VIA_A: previously 0.7 km northwest from the Proposal's closest turbine, now 9.4 km from the Proposal's closest turbine.
- VIA_B: previously 1.6 km north-northeast from the Proposal's closest turbine, now 2.5 km from the Proposal's closest turbine.
- VIA_C: previously 5.2 km west from the Proposal's closest turbine, now 7.7 km from the Proposal's closest turbine.
- VIA_G: previously 2.3 km north-northeast of the Proposal's closest turbine, now 3.2 km from the Proposal's closest turbine.
- VIA_H: previously 5.9 km southeast of the Proposal's closest turbine, now 7.8 km from the Proposal's closest turbine.
- VIA_J: previously 0.5 km southwest of the Proposal's closest turbine, now 0.9 km from the Proposal's closest turbine.
- VIA_K: previously 7.3 km southwest west-southwest of the Proposal's closest turbine, now 8 km from the Proposal's closest turbine.
- VIA_L: previously 12.8 km southwest of the Project's closest turbine, now 13.5 km from the Proposal's closest turbine.
- VIA_M: previously 9.4 km east from the Proposal's closest turbine, now 12.7 km from the Proposal's closest turbine.

VIA_D, VIA_E, VIA_F, VIA_I remain unchanged in terms of distance to closest turbine. VIA_E was previously intersecting the IDF however, and now is not.

Of those 13 POIs, all but one (VIA_M), were predicted to have visibility of the Proposal. Implementation of the Proposal is predicted to result in a minor to moderate impact to 11 of



the assessed POIs surrounding the Proposal, with one (VIA_G) resulting in a moderate to high impact (SLR, 2024b) (Table 9-18). However, as noted above this POI is now 0.9 km further from the closest turbine than it was when assessed. Therefore, this impact is likely to be reduced.

Bonney Downs Homestead was assessed from VIA11, and pre-development is a predominantly natural view with some modified elements including Bonney Downs Station tracks and laydown areas in the foreground to midground. The predicted view is a partly natural view and partly modified view, with modified elements including the Bonney Downs Station tracks and laydown areas and the Proposal's wind turbines. The implementation of the Proposal results in an alteration of the nature of the view due to the clearly perceptible and wide-ranging change in the midground to background of the view.

Table 9-18: Summary of Visual Impact Ratings (SLR, 2024b)

POI	POI Sensitivity	Magnitude of Change	Impact Rating	Location/ View
VIA_A	Medium	Moderate	Moderate	View of unnamed track on Bonney Downs Station, 0.7 km northwest from the Proposal's closest turbine in the view.
VIA_B	Medium	Moderate	Moderate	View close to Bonnie Pool, 1.6 km north-northeast from the Proposal's closest turbine in the view.
VIA_C	Medium	Moderate	Moderate	View from Bonney Downs-Hillside Road on Hillside Station, 5.2 km west from the Proposal's closest turbine in the view.
VIA_D	Medium	Moderate	Moderate	View from Bonney Downs-Hillside Road on Bonney Downs Station, 3.1 km northwest from the Proposal's closest turbine in the view.
VIA_E	Medium	Moderate	Moderate	View from Bonney Downs-Hillside Road, 1 km southwest of the Proposal's closest turbine in the view.
VIA_F	Medium	Low	Minor-moderate	Marble Bar Road View from Marble Bar Road, 5.9 km southeast of the Proposal's closest turbine in the view.
VIA_G	High	Moderate	Moderate-high	Bonney Downs Station Homestead; Marble Bar Road View from the Bonney Downs Homestead, 2.3 km north-northeast of the Proposal's closest turbine in the view.
VIA_H	Medium	Negligible	Minor	Bonney Downs-Noreena Road View from Bonney Downs-Noreena Road, 5.9 km southeast of the Proposal's closest turbine in the view.
VIA_I	Medium	Moderate	Moderate	Marble Bar Road View from Marble Bar Road, 3.1 km southeast of the Proposal's closest turbine in the view and approximately 2 km north of Soda Spring.
VIA_J	Medium	Moderate	Moderate	View from a station track on Bonney Downs Station parallel to Nullagine Mine Haul Road, 0.5 km southwest of the Proposal's closest turbine in the view



POI	POI Sensitivity	Magnitude of Change	Impact Rating	Location/ View
VIA_K	Medium	Negligible	Minor	View from Nullagine Mine Haul Road, 7.3 km southwest west-southwest of the Proposal's closest turbine in the view
VIA_L	Medium	Low	Minor-moderate	View from Nullagine Mine Haul Road, 12.8 km southwest of the Project's closest turbine.
VIA_M	High	None	None	Nullagine River View close from Nullagine River, 9.4 km east from the Proposal's closest turbine.

The VIA concluded that overall, alteration to visual amenity will be widespread, however the natural landscape will remain dominant and not result in the alteration or disruption to valued landscape characteristics, including rivers, major waterways, or ranges. These key features remain physically unaffected and largely visually unaffected during the operational phase (SLR, 2024b).

The outcomes of the shadow flicker assessment concluded that the Bonney Downs Station Homestead and all POIs will not be impacted above threshold levels, and therefore potential impacts are not considered significant (SLR 2024b).

Minimal operational lighting will be required on-site, and potential night- time light impacts are not expected to be significant. The night-time light assessment indicated that, due to the large distances to sensitive receivers, there is negligible to nil risk of exceeding the light spill limit (SLR, 2024); therefore, it is not expected to be a significant impact. Additionally, red flashing lights on turbine nacelles, required for aviation safety in consultation with the Civil Aviation Safety Authority, may be visible from sensitive receptors and POIs; however, any illumination from these would be minimal (SLR, 2024b).

At the Proposal's end of life, the wind farm and all infrastructure will be decommissioned. Therefore, following vegetation rehabilitation, no significant changes to the visual landscape are expected.

The Proposal is considered likely to meet the project-specific VMOs due to the following:

- The Project does not result in a dominant change in view for the POI that are located > 1 km from the Project, nor for POI < 1 km from the Project,
- The Project does not result in the removal of valued characteristics, such as major waterways or isolated rounded hills. Nor does it result in significant alteration or disruption to views of these, and
- Turbines are visually apparent within the visual catchment area and in some views are a major element however the natural landscape remains the dominant characteristic.

9.7.3.3 Dust

The dust assessment (GHD, 2025) concluded that air quality will comply with relevant criteria for all assessed pollutants (PM10, PM2.5, and Total Suspended Particulates) for construction and operation scenarios through implementation of proposed management measures (Section 9.6.3.3). It should also be noted that since this dust assessment the clearing required



has being substantially reduced from 2,044 ha to 944.07 ha. Therefore, less dust will be generated during construction.

To further mitigate dust generation during construction, standard best practice measures outlined within the EMP (Appendix B) will be implemented. Due to the remote location of the DE and the limited number of other sensitive receptors nearby, the risk of significant dust impacts is considered low.

Impacts associated with dust on Aboriginal Cultural Heritage and Cultural Values are discussed in Section 9.7.1.4.

9.7.4 Cumulative Impacts

Cumulative environmental impacts are the successive, incremental, and interactive impacts on the environment of projects with one or more past, present and reasonably foreseeable future activities (EPA, 2023a). This section outlines the potential cumulative impacts to social surroundings as a result of the Proposal and other surrounding developments either recently approved or currently under assessment.

In undertaking a cumulative impact assessment, the following assumptions are noted:

- Cumulative impacts resulting from third-party operations are based on information available in the public domain for third party operators and does not encapsulate impacts for all third-party operations in the region,
- Cumulative impact calculations generally do not take into consideration areas outside of those assessed under Part IV of the EP Act, or EPBC Act referrals, for each relevant proposal. Where relevant, large clearing permits under Part V of the EP Act may also be included depending on the quantity and quality of information available, and
- The accuracy of data from external sources will not be verified and it is assumed that data publicly available is accurate and collected in accordance with standard industry guidelines.

There are several reasonably foreseeable developments within the Proposal area and the broader region, including the Chichester subregion of the Pilbara bioregion. With respect to noise, dust and visual impacts, implementation of any single project may not significantly impact a sensitive receptor. However, a combination of current and reasonably foreseeable future projects may generate cumulative emissions or changes to views that are above acceptable levels. The only identified receptors in close proximity to the DE are associated with Traditional Owner use of the area (both Palyku and Nyiyaparli) and Bonney Downs Homestead. No similar Proposal is located near Bonney Downs Homestead. Given this, cumulative impacts were assessed based on potential impacts to cultural values.

The following active projects have been identified as potentially relevant cumulative developments given, they are within the same Native Title Determination Areas and have not yet commenced construction or are still under construction:

Palyku People

- Mulga Downs Hub and Rail Spur.



Nyiyaparli People

- Nyidinghu Iron Ore Mine,
- Rhodes Ridge Iron Ore Project,
- Jimblebar Hub Significant Amendment,
- Hope Downs 2,
- Mining Area C - Southern Flank, and
- Mindy South Iron Ore Mine.

There is limited information available for the majority of the above developments in relation to noise, dust, access, or visual amenity impacts on cultural values. Furthermore, it is noted that these projects are mostly related to mining operations and therefore are considered to have substantially different impacts to the Proposal. The cumulative developments associated with copper/gold and iron ore mines having acute, long-lasting impacts that are not specifically comparable to that of a wind farm development for which impacts from dust, noise, and access are short term during construction and otherwise considered to be insignificant. The potential for amenity impacts associated with a large-scale wind farm are predominantly associated with visual impacts, for which the mining operations are considered to have lower potential or limited information on their impacts on visual amenity. Therefore, the Proposal is not anticipated to have any potential for cumulative impacts with regards to noise, dust, access or visual amenity.

Palyku and Nyiyaparli have raised general concerns on impacts on waterways and water flows. Due to the minor nature of the creek crossings, regional surface water flows are not expected to be disrupted. Therefore, the Proposal is unlikely to modify the hydrology and morphology of watercourses within, and downstream of the DE. As a result, impacts are expected to be low, with any potential effects on major waterway flow regime expected to be minor and localised. Consequently, no combined cumulative impacts to regional surface water flows are expected.

Additionally, the Proposal is situated within four different catchments, only one of which, the Fortescue Upper River, contains other proposals that could result in cumulative impacts. All of these other proposals fall within the Nyiyaparli Native Title area. Given that only a single turbine from the Proposal is located in Fortescue Upper River catchment, cumulative impacts in this catchment are not likely to occur.

9.8 Environmental Outcomes

Table 9-19 summarises the expected environmental outcomes for the Revised Proposal, following the implementation of mitigation and management measures. The environmental outcomes proposed are mainly outcome-based conditions. However, environmental objectives are proposed in some cases as outcome based conditions are not practical due to the outcome depending on consultation with Traditional Owners. Additionally, some objectives are dependent on the implementation of management plans related to other key environmental factors.



[This page has been left blank intentionally]



Table 9-19: Summary of Residual Impacts for Social Surroundings after Mitigation Measures

Theme/Topic	Concerns/Queries raised by Traditional Owners	Potential Impact	Potential consequence	Proposed Environmental Outcome
Direct Impacts				
Heritage Places	<ul style="list-style-type: none"> • Unauthorised disturbance to Heritage Places and objects within the DE. • Unauthorised access by Fortescue personnel and contractors. 	<ul style="list-style-type: none"> • Removal or damage to cultural material, including engravings and grinding materials. 	<ul style="list-style-type: none"> • Loss of cultural information and connection to ancestors. • Potential breach of AH Act (WA) for unauthorised impact to heritage sites. 	<p>SS-1 Environmental Outcome:</p> <p>No unauthorised disturbance to Aboriginal cultural heritage sites in the development envelope, unless consent is granted to disturb that site under WA legislation which specifically relates to Aboriginal heritage and has required informed consultation with relevant Traditional Owners.</p> <p>Management of potential impacts to Aboriginal Cultural Heritage Sites in the Development Envelope is regulated under the under the Aboriginal Heritage Act</p>
Plants & Animals	<ul style="list-style-type: none"> • Concern expressed about bird collision with turbine and expected increase in feral animals • General concern expressed about native plants and animals, and maintaining the overall biodiversity of the area. • Avoid disturbance to mesas, identified by Palyku as a place of important animal habitat. 	<ul style="list-style-type: none"> • Loss native birds and bats or changes to migratory patterns • Loss of biodiversity of native plant and animal species. • Inability to access areas for traditional activities (e.g. resource gathering / hunting) 	<ul style="list-style-type: none"> • Loss of culturally significant animals and plants used for traditional purposes (e.g. medicine, bush tucker, hunting) 	<p>As per environmental objectives FV-5 and TF-3</p>
Water	<ul style="list-style-type: none"> • General concerns on impact on waterways and flows from springs, river and creek catchments, waterholes and creeks. 	<ul style="list-style-type: none"> • Disturbance to creek lines or banks from proposed crossings or widening of 	<ul style="list-style-type: none"> • Loss of healthy waterways and Country • Potential breach of AH Act (WA) for unauthorised impact to heritage sites (where 	<p>No condition required as no significant impact anticipated.</p> <p>Management of potential impacts to surface water and groundwater is regulated under the RIWI act.</p>



Theme/Topic	Concerns/Queries raised by Traditional Owners	Potential Impact	Potential consequence	Proposed Environmental Outcome
	<ul style="list-style-type: none"> Impacts on water sources perceived to have been impacted by Nullagine Iron Ore Project. Disturbance to Bonnie Pool. 	<ul style="list-style-type: none"> existing tracks over creeks. Loss or reduction in water flow to creeklines Loss of Bonnie Pool. 	<ul style="list-style-type: none"> water sources are recorded as Heritage Places). 	
Indirect Impacts				
Dust	<ul style="list-style-type: none"> General concern around dust emissions from the Proposal. 	<ul style="list-style-type: none"> Increased dust from construction and operation reducing aesthetics at culturally significant areas and the wider cultural landscape. Decline of plant health for culturally significant flora in high-risk areas. 	<ul style="list-style-type: none"> Loss of enjoyment of country. Loss of culturally significant animals and plants used for traditional purposes (e.g. medicine, bush tucker, hunting) 	<p>As per environmental objective FV-5 Management of potential impacts from dust is currently regulated under the Mining Act.</p> <p>SS-2 Environmental objective: The proponent must undertake ongoing consultation and engagement with relevant Traditional Owners about the achievement of the outcomes and objectives SS-1, FV-5 and TF-3 for the life of the proposal. The proponent must take reasonable steps to consult with relevant Traditional Owners when revising the following environmental management plans:</p>
Noise and vibration	<ul style="list-style-type: none"> Vibration from operating wind turbines affecting native animals. Excessive noise levels impacting ability to undertake traditional activities at Bonnie Pool or surrounding areas 	<ul style="list-style-type: none"> Reduced use of the area for traditional activities due to noise from construction. Permanent loss of access to areas for traditional activities due to noise from operation. Noise and Vibration from operating wind turbines resulting in altered animal behaviour. 	<ul style="list-style-type: none"> Loss of connection to Country and culture in this area. 	<p>(1) Bonney Downs Environmental Management Plan</p> <p>(2) Bonney Downs Bird and Bat Adaptive Management Plan</p>



Theme/Topic	Concerns/Queries raised by Traditional Owners	Potential Impact	Potential consequence	Proposed Environmental Outcome
Visual amenity	<ul style="list-style-type: none"> Request to keep infrastructure (turbines, poles) off mesas and hills. Being able to see wind turbines from Bonnie Pool 	<ul style="list-style-type: none"> Reduced aesthetics at culturally significant areas and wider cultural landscape. No longer use or visit the area to undertake traditional activities. 	<ul style="list-style-type: none"> Loss of natural landscape and connection to Country and culture in this area. 	No condition required as no significant impact anticipated.
Access to Country	<ul style="list-style-type: none"> Maintain access to the development area. Maintain access to Bonney Downs area as a place used for camping and hunting. 	<ul style="list-style-type: none"> Reduced use of the area or inability of access the area for traditional activities resulting in loss of connection to Country and cultural practices. 	<ul style="list-style-type: none"> Loss of connection to Country and culture in this area. 	SS-3: Environmental outcome: Subject to implementation of health and safety protocols, no interruption of ongoing access to land utilised for traditional use or custom by relevant traditional owners.
Water	<ul style="list-style-type: none"> Impacts to water flow and quality of rivers, Bonnie Pool and creek lines. 	<ul style="list-style-type: none"> Altered hydrological regime of rivers and creek lines impacting health of waterways and natural characteristics. 	<ul style="list-style-type: none"> Loss of healthy waterways and Country Cultural responsibility for downstream impacts on neighbouring language group Country. 	No condition required as no significant impact anticipated. Management of potential impacts to surface water and groundwater is regulated under the RIWI act.

No significant residual impacts to Social Surroundings have been identified and the EPA's objective for the Social Surroundings factor 'to protect social surroundings from significant harm' can be met.



10 OTHER ENVIRONMENTAL FACTORS

As discussed in Chapter 6, some environmental factors were eliminated from further assessment given there are no credible impact pathways identified, such as the marine related factors. Other environmental factors were identified as requiring a less detailed assessment than the preliminary key environmental factors as they are either subject to controls under other legislation, are effectively managed through routine/business as usual environmental management procedures, or the Proposal poses a very low risk of impact to these factors. The factors requiring a less detailed impact assessment are:

- Inland Waters,
- Terrestrial Environmental Quality, and
- Landforms.

10.1 Inland Waters

10.1.1 EPA Objective

The WA EPA's objective for the Inland Waters environmental factor is '*to maintain the hydrological regimes and quality of groundwater and surface water so that environmental values are protected*' (EPA, 2018).

Inland Waters are defined as '*The occurrence, distribution, connectivity, movement, and quantity (hydrological regimes) of inland water including its chemical, physical, biological and aesthetic characteristics (quality)*' (EPA, 2018).

10.1.2 Policy and Guidance

The following policies and guidelines have been considered for the Proposal in order to meet the EPA's objective in relation to this factor:

- Statement of Environmental Principles, Factors and Objectives (EPA, 2023b),
- Environmental Factor Guideline – Inland Waters (EPA, 2018),
- Water Quality Protection Note No. 25. Land use compatibility tables for public drinking water source areas (DWER, 2021a),
- Water Quality Protection Note No. 28. Mechanical servicing and workshops (DoW, 2013),
- Water Quality Protection Note No. 65. Toxic and hazardous substances (DoW, 2015),
- Water Quality Protection Note No. 84. Rehabilitation of disturbed land in public drinking water source areas (DoW, 2009), and
- Assessment and management of contaminated sites (DWER, 2021c).



The Environmental Factor Guideline for Inland Waters has been considered during the identification of values within the DE, and the issues identified in the guideline considered in relation to potential impacts from the Proposal.

10.1.3 Studies and Surveys

A baseline hydrology assessment (Advisian, 2023) was completed for the proposed wind farm area and is provided in Appendix R. This assessment was undertaken to develop an understanding of surface water behaviour within and surrounding the project, to support preliminary layout/design of wind turbines, associated infrastructure and approvals.

A post development hydrology study was then completed for the generation area (wind power) (Fortescue, 2024) and is provided in Appendix S. This assessment evaluated the potential changes to existing surface water flow regime as a result of the Proposal. The report involved hydraulic modelling to estimate surface water flow characteristics, including flow volumes, flood depths and velocities, an impact assessment and recommendations for mitigations. Note this study was completed for a much larger disturbance footprint than the current Proposal (which has subsequently been reduced through implementation of the mitigation hierarchy to avoid environmental values), and therefore reports a substantially worse case in terms of impacts than the Proposal.

10.1.4 Limitations

No limitations were listed within the hydrology assessments (Advisian, 2023; Fortescue, 2025; Fortescue, 2024).

10.1.5 Receiving Environment

10.1.5.1 Surface Water

The DE is located within the Pilbara Surface Water Area proclaimed under the RIWI Act (DWER, 2018a). No Public Drinking Water Source Areas are located within the DE, however the Nullagine Water Reserve (Priority 1 and Priority 3), is located approximately 2 km east of the northern section of the DE (DWER, 2024a).

The DE occurs within the De Grey River and Fortescue River basins and overlaps four catchments: (1) Nullagine River, (2) Coongan River, (3) Shaw River and (4) Fortescue River (DWER, 2024c). The Proposal infrastructure within the DE overlaps the Shaw River, Nullagine River and Fortescue River catchments. The DE is located within the headwater areas of these catchments.

The Nullagine River, Coongan River and Shaw River generally flow in a northerly direction towards the De Grey River, approximately 200 km downstream of the DE. Surface water in the southern section of the DE flows from north to south towards the Fortescue River (Fortescue, 2025) with minor watercourses within the southern area of the DE flowing towards the Fortescue Marsh, located approximately 9 km from the DE and 25 km from nearest wind turbine. The upper Fortescue River (as well as direct rainfall) contributes the majority of surface runoff to the Fortescue Marsh (Skrzypek *et al.*, 2013). The Fortescue Marsh is the largest, most important wetland in the Pilbara region (DBCA, 2024e) and is listed on the Directory of Important Wetlands of Australia (DBCA, 2018) and on the draft (proposed) RAMSAR list (DBCA, 2017).



The upstream catchment contributions of the Nullagine, Coongan, Shaw and Fortescue rivers are minimal compared to their total catchments (Fortescue, 2025). These catchments are displayed on Figure 10-1.

There are three major watercourses and a number of minor watercourses that drain through the DE. These watercourses include Nullagine River (major watercourse), Bonnie Creek (a tributary of Nullagine River), and Coongan River (major watercourse). A number of ephemeral pools (including Bonnie Pool) are located along Bonnie Creek within the DE. Bonnie Pool appears to be re-charged by surface water and groundwater flows and would be flushed during wet season flows (Stratagen, 2013). Catchment characteristics for the main watercourses within the DE are provided in Table 10-1 below.

Table 10-1: Catchment Characteristics for Main Watercourses within the Development Envelope

Creek System	Total Catchment Area (km ²)	Mainstream Length (km)	Equal Area Slope (m/km)
Nullagine River	7,219	261	1.29
Bonnie Creek	254	32	2.94
Coongan River	7,091	209	1.95

Fortescue (2024) undertook detailed analysis of observed streamflow records at Marble Bar and Nullagine gauging stations, with peak flow estimates based on Flood Frequency Analysis of streamflow records provided in Table 10-2.

Table 10-2: Peak Flow Estimates for Coongan and Nullagine River Catchments

DWER Stream Gauge	Catchment Area to Gauge (km ²)	Peak Flow (m ³ /s)					
		50% AEP	20% AEP	10% AEP	5% AEP	2% AEP	1% AEP
Coongan River at Marble Bar (710204)	3,736	508	1,148	1,736	2,463	3,721	4,972
Nullagine River at Nullagine (710004)	873	232	738	1,198	1,698	2,376	2,895

10.1.5.2 Groundwater

The DE is located within the Pilbara groundwater area, proclaimed under the RIWI Act. Groundwater resources in the Pilbara groundwater area are managed through the Pilbara Groundwater Allocation Plan, which covers an area of 200,000 km², including Port Hedland and extending inland to Marble Bar, Wittenoom, Nullagine, Tom Price and Newman (WA Government, 2023). The groundwater resources within the Pilbara are a mix of alluvial, sedimentary and fractured rock aquifers (WA Government, 2023).

The DE is located on the northeastern edge of the Hamersley Basin and features Tertiary aged channel iron deposits and detritals which lay non-conformably over Archean basalts and metasediments of the Fortescue Group, known as the Maddina basalts. Underlying the basalts and metasediments are faulted and folded Archean granitoids which form part of the Pilbara Craton.

Two main aquifers have been identified in the DE:

- Superficial formations, including detritals and local calcretes, and



- Fractured and weathered bedrock.

The superficial formations host very localised, seasonal aquifers with low yield potential. Most of the upper creeks are unsaturated. The detritals are characterised by poorly sorted, angular to sub rounded gravel clasts, and calcrete precipitates which are highly weathered. No evidence of karstic features has been observed within the calcretes, or any other indication of enhanced secondary permeability (Fortescue, 2021).

The superficial formations overlie the Fortescue Group basalt bedrock. Increased permeability, secondary porosity and groundwater yields in the basalt are associated with fracture formation and weathered bedrock profiles. Groundwater occurs predominantly in deep fractures, estimated to be 44 to 65 m deep, but to a lesser extent also in shallow weathered and fractured zones from 6 to 18 m depth (Fortescue, 2021).

The two aquifers appear to be hydraulically connected, with no clay or confining layers logged. Groundwater flow is typically from south to north across the site, consistent with topographic flow from recharge to discharge areas. Groundwater levels range from approximately 2 m to 19 m below ground level (mbgl).

The aquifers are likely limited in storage and highly dependent on direct rainfall recharge. Large seasonal variations in groundwater levels are observed, ranging from 2 to 5 m. Groundwater discharge in the area likely occurs via pool systems and in creek lines due to evapotranspiration (Fortescue, 2022).

Regional groundwater quality is generally brackish, with recent measurements from 2023 indicating a salinity range between 680 and 2,640 $\mu\text{S}/\text{cm}$ (Fortescue, 2025). However, salinity was recorded as high as 7,980 $\mu\text{S}/\text{cm}$ during these measurements (Bore NP16).

Groundwater investigation drilling conducted between September 2009 and February 2010 (MWH, 2010) intersected low yielding fractures (< 1.0 litres per second (L/s)) between 8 m and 27 m depth. Higher yielding fractures (4.0 L/s to 6.0 L/s) were encountered between 26 m and 52 m in depth.

Groundwater Dependant Ecosystems

Groundwater Dependent Ecosystems (GDEs) are those that require access to groundwater on a permanent or intermittent basis to meet their water requirements. The function and composition of these ecosystems is often highly responsive to changes in groundwater availability (Murray *et al.*, 2003). The groundwater regime is a key factor influencing the composition of flora and fauna, ecological processes and ecosystem services associated with GDEs (Hatton and Evans, 1998; Evans and Clifton, 2001).

Flora and vegetation surveys undertaken for the Proposal (ecologia, 2025a) identified potentially ground water dependent vegetation within the DE. Specifically, vegetation units EcAcCs and EvAcCc (discussed further in Chapter 7). There is a total of 4,349.03 ha of potentially groundwater dependent vegetation within the DE.

Persistent surface water occurs in Bonnie Pool which is located 8 km north-east of the former BC Iron's Nullagine Iron Ore Project (MWH, 2010) (Figure 10-1). Bonnie Pool is predominantly fed by surface water flow with only minor alluvial groundwater input occurring directly after surface water flow events (Hydrobiology, 2014).



Water Supply Strategy

Fortescue acquired the BC Iron Nullagine Iron Ore Project in 2016. A total of 17 production bores were constructed to supply water during the mine operations at NIOP (2009-2015) as shown in Figure 10-3, with drilled depths between 34 m and 114 m. The bores targeted fractured rock aquifers within the volcanics and metasediments, with variable yields between about 2 and 10 L/s. It is intended to use several of these existing bores to supply the water requirements for the Proposal.

Fresh to marginal water from groundwater sources will be targeted to meet construction demands for the Proposal. During construction (anticipated to last two years), an estimated water demand of 0.85 GL/yr has been determined. This demand is expected to reduce to less than 0.1 GL/yr in subsequent years for operational purposes.

Fortescue has an existing groundwater extraction licence (GWL171278(7)) that will be sufficient for the supply of water for construction and operation of the Proposal. Under this licence, abstraction of up to 1.01 GL/yr is allowed.

Drawdown associated with abstraction has the potential to impact environmental receptors, including Bonnie Pool. Bonnie Pool is understood to be the nearest surface water pool to the existing NIOP production bores. It lies approximately 1 km north of production bore WW4, whilst all other production bores are at least 4 km further south of Bonnie Pool (Figure 10-3).

The production bore network abstracts groundwater from deeper weathered and fractured rock aquifers, rather than the shallow alluvial aquifers that provide the minor volumes of groundwater to Bonnie Pool. Therefore, abstraction from the existing production bores is unlikely to impact Bonnie Pool.

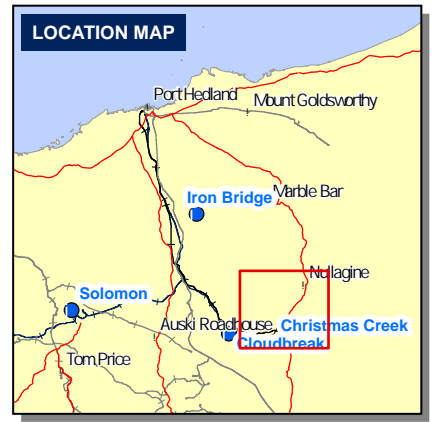
Further, despite this unlikely impact, abstraction from WW4 is not intended to be undertaken during the Proposal, with abstraction spread across the remaining bores to minimise the potential for the drawdown footprint to extend to Bonnie Pool.

Simple analytical methods (using the Theiss formula) were used to determine the extent of drawdown at recommended flow rates from the next two nearest bores, NP51 and NP55. The analysis shows that if these bores were to be pumped at recommended rates, the lateral extent of drawdown would reach an estimated 800 m and 1,050 m from the centre of the bores respectively. This drawdown extent is well short of the >4 km distance to Bonnie Pool from these bores. Additionally, further studies have found that Bonnie Pool is outside the potential zone of influence for impact associated with groundwater abstraction at the NIOP (Worley Parsons 2014a, 2014b; Hydrobiology, 2014).

Mitigation measures to minimise impacts to Bonnie Pool are outlined in Section 10.1.6.3.



[This page has been left blank intentionally]



Legend

Development Envelope	Public Drinking Water Source Areas
GOV Towns	Priority 1
Major Roads	Priority 3
Fortescue Rail	Catchment Area
Roy Hill Rail	Coongan River
Indicative Disturbance Footprint	Fortescue River Upper
Approved Disturbance (Nullagine Pilot Wind Farm)	Nullagine River
Creek/Drainage lines	Oakover River
Bonnie Creek	Shaw River
Drainage Lines	Microhabitat Locations
River Basins	Artificial pool/waterhole
De Grey River	Non-permanent pool/waterhole
Fortescue River	Permanent pool/waterhole

Data Source(s):
Aerial, Fortescue and ESRI
All other data, Fortescue, 2025

0 2 4 6 8 10
Kilometers

Figure 10-1
Inland Water Features

Requested By: R. Dorji
Drawn By: R. Kerr
Revised By: rykerr
Approved By:
Scale: 1:400,000

Date: 2/2/2026
Size: A4L
Revision: 1
Confidentiality: 0

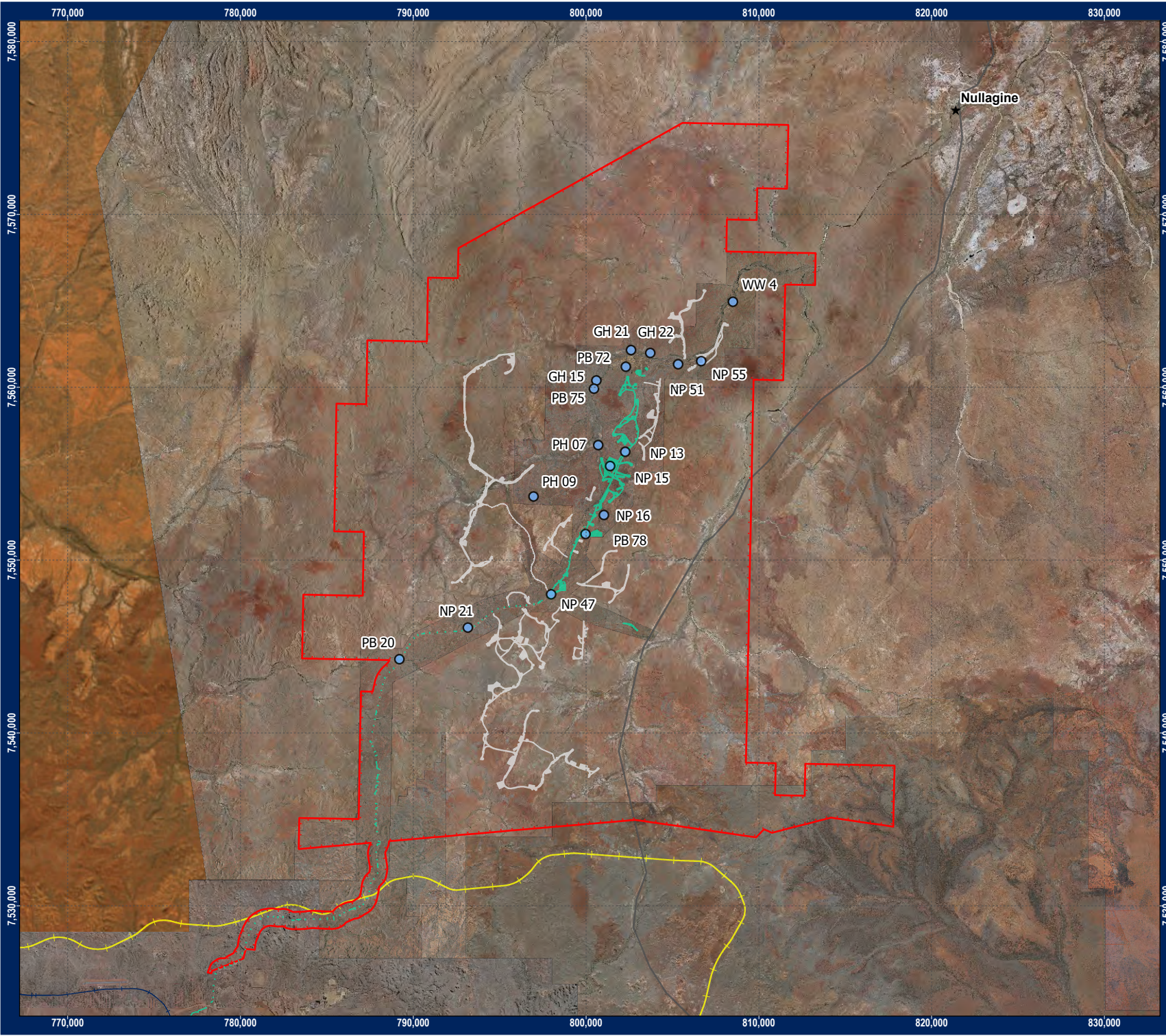
Coordinate System: GDA 1994 MGA Zone 50
Project Name: 45190P002_MP_EN_0093_PartIV_3
Document Name: 45190P002_MP_EN_0093_CB4_r1_InlandWater

Fortescue accepts no liability and gives no representation or warranty, express or implied, as to the information provided including its accuracy, completeness, merchantability or fitness for purpose.





[This page has been left blank intentionally]



- Legend**
- ▭ Development Envelope
 - ★ GOV Towns
 - Major Roads
 - Fortescue Rail
 - Roy Hill Rail
 - ▭ Indicative Disturbance Footprint
 - ▭ Approved Disturbance (Nullagine Pilot Wind Farm)
 - Production Bore Locations

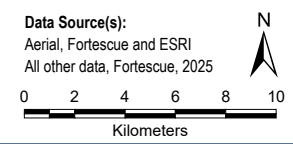


Figure 10-2
Production Bore Locations
 within the Development Envelope

Requested By: R. Dorji Date: 1/30/2026
 Drawn By: R. Kerr Size: A4L
 Revised By: rykerr Revision: 0
 Approved By: Confidentiality: 0
 Scale: 1:300,000
 Coordinate System: GDA 1994 MGA Zone 50
 Project Name: 4519OP002_MP_EN_0093_PartIV_3
 Document Name: 4519OP002_MP_EN_0093_036_r0_ProdBores
 Fortescue accepts no liability and gives no representation or warranty, express or implied, as to the information provided including its accuracy, completeness, merchantability or fitness for purpose.



7,580,000
7,570,000
7,560,000
7,550,000
7,540,000
7,530,000

7,580,000
7,570,000
7,560,000
7,550,000
7,540,000
7,530,000

770,000 780,000 790,000 800,000 810,000 820,000 830,000

770,000 780,000 790,000 800,000 810,000 820,000 830,000



[This page has been left blank intentionally]



10.1.6 Potential Impacts and Mitigation

10.1.6.1 Potential Impacts

Implementation of the Proposal may have the following impacts on surface waters:

- Changes to the volume of surface water entering watercourses and subsequent impact on downstream values, such as Bonnie Pool and Fortescue Marsh,
- Changes to overland flow paths which may impact on surface water dependent systems, such as banded mulga communities,
- Increased sediment loads in watercourses and potential downstream impacts to sensitive areas from water quality impacts, such as Bonnie Pool and Fortescue Marsh, and
- Changes to flow velocities and flow paths associated with watercourse crossings, increasing potential for scouring and erosion of the bed and banks.

10.1.6.2 Assessment of Potential Impacts

By comparing modelling results of baseline and post development scenarios, areas that may be affected by the Proposal have been identified to assess potential impacts.

The post development assessment undertaken for the wind turbines and associated infrastructure (Fortescue, 2024b) was modelled on a much larger disturbance footprint than the current Proposal (which has subsequently been reduced through implementation of the mitigation hierarchy to avoid environmental values), and therefore reports a substantially worse case in terms of impacts than the Proposal. This study concluded that:

- Areas within the DE with noticeable flow regime changes would be isolated to the turbine access tracks and watercourse crossings. The number of minor and major watercourse crossings have been minimised through project design where possible. The majority of crossings required for the Proposal are minor crossings (with catchment areas less than 5 km²) and resulting impacts are expected to be minor (Fortescue, 2024b). Any potential impacts would be confined to 200 m upstream and downstream of crossing structures,
- The impacts from major watercourse crossings would be localised and unlikely to impact on regional hydraulic regimes. Decreased flow rates and an increase in ponding of water upstream of the crossing (backwater) may result from flow constrictions or obstructions caused by the culvert structures and road embankment. These impacts are not anticipated to extend more than 400 m upstream. Mitigation measures to reduce this impact are provided in Section 10.1.6.3,
- The main watercourse maximum flood depth and velocity changes are minimal (within +/- 0.02 m and +/-0.02m/s) indicating the Proposal is unlikely to substantially modify the hydrology and morphology of these watercourses both within and downstream of the DE,



- The Proposal would result in minor changes in the total flow volume contributing to the main watercourses (including Coongan River, Shaw River, Nullagine River and Bonnie Creek). These changes are marginal (< 1%) due to the IDF being small in size compared to the associated catchments and the location of the DE in the upper catchment,
- The post development assessment also reported that the effects of the Bonnie Creek crossing in low flow conditions (i.e., flows for events smaller than 10% AEP) are negligible. For any potential larger events, the impacts are still anticipated to be local and unlikely to extend more than 300 m downstream and are unlikely to impact regional flow conditions, including water quality and volumes into Bonnie Pool (which is located approximately 7 km downstream of the crossing), and
- The changes to flow velocities in the vicinity of the watercourse crossings may impact existing geomorphological conditions of creek systems. Reduced flow rates at watercourse crossings may result in a higher rate of sediment deposition upstream of the road embankment while introducing artificial constriction and obstruction (such as culverts embankments) may change flow paths in the immediate vicinity, resulting in localised erosion/scour.

In relation to potential downstream impacts to the sensitive receptor, Fortescue Marsh, it should be noted that the turbines and associated infrastructure are located approximately 29 km from the Fortescue Marsh and Christmas Creek mine is located between the DE and the Fortescue Marsh. The mine has existing surface water (i.e., stormwater) management practices and infrastructure in place to minimise the risk of low-quality water entering this sensitive receptor. Therefore, no impacts to the Fortescue Marsh are anticipated from the Proposal.

The Proposal activities (i.e., earthworks, transportation of pollutants, treated wastewater, refuelling and spills/leaks) may impact surface water quality, potentially leading to poor water quality, particularly in relation to stormwater runoff from the IDF. The potential for large sediments loads to enter watercourses is considered low due to the mitigation measures proposed. Furthermore, impacts from contamination (i.e., spills) will be avoided and minimised through the mitigation measures outlined below and therefore result in negligible impacts. Therefore, it is unlikely that Proposal activities such as minor earthworks will result in significant impacts.

Overall, the Proposal design and layout are anticipated to have very low impacts on the existing surface water flow regime and water quality within the DE and downstream.

10.1.6.3 Proposed Mitigation Measures

To reduce potential impacts, the following mitigation is proposed:

- A construction surface water and sediment management plan will be developed and implemented to manage flood risk and minimise soil erosion and the potential for the transport of sediment to downstream waters during the construction phase,
- Where possible, construction activities will be avoided during the periods of heavy rainfall to avoid erosion/scour, damage to the soil and to minimise risk of water quality degradation in the downstream systems,



- Erosion control measures will be installed at the inlet and outlet of the culvert structures to minimise the risk of bed and bank erosion and local scour, and to prevent undermining of the structures,
- The floodway batters and driving surface will be armoured to minimise erosion and sedimentation downstream, and
- Clearing of riparian vegetation will be avoided and minimised where possible

The design of the turbine access track aims to minimise crossing of watercourses. Where this is unavoidable due to the need to access turbines, the following design principles are implemented to minimise impacts:

- Track alignment and crossing design to utilise existing cleared tracks where possible,
- Each watercourse is crossed only once within the DE to avoid accumulated impacts,
- Crossing of major watercourses (named rivers/creeks) is minimised where possible,
- Watercourse crossings to be positioned perpendicular to the flow direction to reduce the effects of streamflow energy on the structure as well as impacts resulting from the redirection of flows against channel banks, such as scouring and erosion,
- Crossing design to maintain flow continuity and minimise impacts to volume and flow rates of watercourses, and
- Crossing to be designed to minimise disturbance required in watercourses.

Potential bed and bank erosion and local scour caused by construction of watercourse crossings will be managed through a permit to interfere with the bed or banks of a watercourse under the RIWI Act (Bed and Banks Permit). Conditions and requirements of the permit are expected to include requirements for erosion control, vegetation management, rehabilitation and maintaining natural water flow in order to minimise potential impacts to watercourses as far as practical.

To ensure negligible impact to Bonnie Pool during project construction and operation, Fortescue will:

- Limit overall abstraction to below the GWL limit of 1.01 GL/yr,
- Avoid use of production bore WW4 during project construction or operation,
- Spread abstraction requirements across the borefield and away from Bonnie Pool where possible,
- Ensure bores are pumped at or below recommended rates, and
- Abide by the conditions of GWL171278(7) and the accompanying GOS, which includes monitoring commitments and trigger levels to ensure impacts to receptors (including Bonnie Pool) are negligible and/or manageable.



10.1.7 Residual Impact and Predicted Outcome

No significant impacts are anticipated as a result of construction or operation of the Proposal with regard to inland waters. The turbines and associated hardstand areas/supporting infrastructure have been designed outside of the 1% AEP floodplain area. Modelling assessment undertaken for the Proposal reported negligible downstream impacts on the sensitive receptor Bonnie Pool (Fortescue, 2025; Fortescue, 2024b), and negligible impacts anticipated to the Fortescue Marsh.

Mitigation of potential impacts to inland waters are also addressed through regulation by other Decision-Making Authorities through permitting and licensing requirements (i.e. 26D and 5C licenses and Permits to Interfere with Bed and Banks under the RIWI Act). The Bed and Banks permit(s) required for construction of the watercourse crossings are expected to include conditions that will effectively mitigate potential impacts, such as destabilisation of watercourse banks during construction and subsequent increased erosion risk.

Construction and operational water requirements will be supplied from the existing borefield, approved under GWL171278(7). No changes to the abstraction volume permitted under this licence are required.

10.2 Terrestrial Environmental Quality

10.2.1 EPA Objective

The WA EPA objective for the terrestrial environmental quality environmental factor is '*to maintain the quality of land and soils so that environmental values are protected*' (EPA, 2016f).

Terrestrial Environmental Quality is defined as '*the chemical, physical, biological and aesthetic characteristics of soils. Soils are the layer of organic and inorganic weathered material that accumulates at the Earth's surface*' (EPA, 2016f).

10.2.2 Policy and Guidance

The following policy and guidance have been considered in this section:

- Statement of Environmental Principles, Factors and Objectives (EPA, 2023b),
- Environmental Factor Guideline – Terrestrial Environmental Quality (EPA, 2016f),
- Identification and Investigation of Acid Sulfate Soils and Acidic Landscapes (DER, 2015a), and
- Treatment and Management of Soil and Water in Acid Sulfate Soil Landscapes (DER, 2015b).

10.2.3 Studies and Surveys

No specific studies or surveys have been completed for the Proposal in relation to Terrestrial Environmental Quality. A desktop review was therefore undertaken using the following information sources:

- Acid Sulfate Soil Risk Map (DWER, 2017),



- Atlas of Australian ASS (Fitzpatrick *et al.*, 2011),
- Contaminated Sites Database (DWER, 2020),
- Soil Landscape Mapping – Systems (DPIRD, 2022), and
- Technical Bulletin No. 92 An inventory and condition survey of the Pilbara region (Van Vreeswyk *et al.*, 2004).

10.2.4 Receiving Environment

Notable considerations regarding Terrestrial Environmental Quality for the Proposal include Acid Sulfate Soils (ASS), land erosion and contaminated sites. According to the ASS Risk Map (DWER, 2017), there is no risk of ASS within the DE. The Atlas of Australian ASS show that the vast majority of the DE (87.05%) is described as having an extremely low probability for occurrence of ASS. However, a recent desktop soil and landform assessment (Landloch, 2025) reported a high chance of ASS occurring in areas associated with Bonnie Creek and the Nullagine River (see Section 10.3.3 for further detail on this assessment).

According to the Contaminated Sites Database (DWER, 2020), no contaminated sites have been recorded within the DE. The closest contaminated site is located 100 km south of the DE in Newman. However, the Nullagine Iron Ore Mine does overlap the northern section of the IDF. This mine has not been formally closed and therefore is not included within the Contaminated Sites Database. The Nullagine Iron Ore Mine is owned and operated by Fortescue and deposits channel ore type (pea gravel) forming numerous steep sided mesas in the area. The Proposal was designed to avoid areas of the mine that are high risk of contamination (i.e., fuel storage, explosives and landfill sites). Testing has not indicated the presence Potentially Acid Forming within the mine site.

There are 12 land systems within the DE (DPIRD, 2022), the majority of which (see Section 3.3.1.2 for full list) are not highly susceptible to erosion (Van Vreeswyk *et al.*, 2004). This is due to their specific soil and landscape characteristics, which help to protect the soil from erosion. However, disturbance to the River Land System may initiate erosion (Van Vreeswyk *et al.*, 2004). This land system covers 0.56% of the DE and is largely stabilised by Buffel grass and Spinifex, and accelerated erosion is uncommon; however, susceptibility to erosion is high or very high if vegetative cover is removed.

The vegetation types mapped by ecologia (2025a) within the DE (see Chapter 7) do not correlate with the above units and therefore, these units are unlikely to be present within the DE.

10.2.5 Potential Impacts and Mitigation

Potential impacts from construction of the Proposal may result in a number of potential impacts including disturbance of ASS (particularly in areas associated with Bonnie Creek and the Nullagine River), land erosion and contamination of soil resulting in a decline in Terrestrial Environmental Quality. Given the limited potential for historic contamination throughout the DE, and that the majority of the land systems of the DE are not highly susceptible to erosion, potential impacts to Terrestrial Environmental Quality can be mitigated through standard environmental management actions.



As detailed in Section 10.1.5.1, with regard to construction of creek crossings, the minor changes in maximum flow velocities are not expected to alter the erosional and depositional regime of the creek systems. The following activities will be undertaken to mitigate the risk of disturbing ASS, exacerbating erosion or contamination of soils:

- Investigatory studies will be undertaken prior to ground disturbance works within the areas at high risk of ASS to verify the presence of ASS within the DE. These studies will be undertaken in accordance with 'Identification and investigation of acid sulfate soils and acidic landscapes' (DWER, 2015),
- Should investigatory studies identify ASS and/or should construction work result in the disturbance of ASS, these ASS will be treated and/or managed in accordance with 'Treatment and management of soil and water in acid sulfate soil landscapes' (DWER, 2015),
- All soils potentially contaminated from spills or leaks will be remediated on site where practical, in line with Fortescue's spill response procedure. Where the volume or type of contamination requires excavation and disposal of contaminated soils, disposal shall be undertaken by an appropriately licenced contractor,
- Hazardous materials used during construction will be stored in compliance with relevant Australian Standards and Regulations,
- On-site refuelling of machinery and plant will occur on sealed or bunded areas and at least 50 m from all drainage lines or water bodies. Drip trays will be used in remote areas where a formalised refuelling area is not feasible,
- Provision of spill response kits at refuelling locations and other areas with a risk of hydrocarbon or chemical spills occurring, and appropriate spill response training for site personnel with incident recording procedures in place throughout construction and operation,
- Cleared vegetation will be stockpiled onsite for use post works completion to encourage soil stability and revegetation. Where possible direct return of topsoil material will be undertaken,
- Establishment of designated access roads and demarcated clearing areas to prevent unauthorised disturbance,
- Erosion and sediment control measures will be applied to prevent erosion of exposed areas and sediment discharge to adjacent areas and topsoil stockpiles, where practicable,
- Laydown areas will be rehabilitated or otherwise stabilised as early as practicable to minimise the potential for erosion, and
- Armouring the floodway batters and driving surface to minimise erosion and scour as water flows over the road.



10.2.6 Residual Impact and Predicted Outcome

With the implementation of mitigation measures listed above, no significant residual impacts to Terrestrial Environmental Quality are anticipated and the EPA's objective for the Terrestrial Environmental Quality factor '*to maintain the quality of land and soils so that environmental values are protected*' can be met.



10.3 Landforms

10.3.1 EPA Objective

The WA EPA’s objective for the Landforms environmental factor is ‘to maintain the variety and integrity of significant physical landforms so that environmental values are protected’ (EPA, 2018b).

Landforms are defined as, ‘the distinctive, recognisable physical features of the earth’s surface having a characteristic shape produced by natural processes. A landform is defined by the combination of its geology (composition) and morphology (form)’ (EPA, 2018b).

10.3.2 Policy and Guidance

The relevant policy and guidance for Landforms is:

- Environmental Factor Guideline – Landforms (EPA, 2018b), and
- Statement of Environmental Principles, Factors and Objectives (EPA, 2023b).

The EPA (2018b) defines criteria for determining whether a landform is significant, as shown in Table 10-3.

Table 10-3: Criteria for Determining Whether a Landform is Significant (EPA, 2018b)

Criteria	Determination
Variety	The landform is a particularly good or important example of its type. The landform is not well represented over the local, regional or national scale or differs from other examples at these scales, either naturally or as a result of cumulative impacts from existing and reasonably foreseeable activities, developments and land uses.
Integrity	The landform is intact, being largely complete or whole and in good condition.
Ecological importance	The landform has a distinctive or exclusive role in maintaining the existing ecological and physical processes; for example, by providing a unique microclimate, source of water flow, or shade. The landform supports endemic or highly restrictive plants or animals.
Scientific importance	The landform provides evidence of past ecological processes or is an important geomorphological or geological site. The landform is of recognised scientific interest as a reference site, or an example of where important natural processes are operating.
Rarity	The landform is rare or relatively rare, being one of the few of its type at a national, regional or local level.
Social importance	The landform supports significant amenity, cultural or heritage values linked to its defining physical features.

10.3.3 Studies and Surveys

Fortescue engaged Landloch Pty Ltd (Landloch) to complete a desktop soil and landform assessment for the Proposal (Landloch, 2025). This assessment characterised landforms within an approximately 96,445 ha survey area (herein referred to as the ‘Landforms Survey Area’), which encompasses the entire extent of the DE. The desktop assessment aimed to identify any landforms of potential significance and involved:



- Review of relevant site information, land systems, and regional soil information,
- Desktop analysis of the landforms present within the DE and assessment of their potential significance,
- Desktop analysis of the soils present within the DE and an assessment of the potential impact from the Proposal,
- Preliminary mapping of soils and landforms based on desktop information, and
- Assessment of potential ASS.

The desktop soil and landform assessment has been used to inform the potentially significant landforms within the DE and is provided in Appendix T.

10.3.4 Receiving Environment

10.3.4.1 Bioregions

The DE is situated in the Pilbara Bioregion, which is made up of four subregions (Chichester, Fortescue Plains, Hamersley and Roebourne). The DE stretches across two subregions, Chichester and Fortescue Plains, however it is predominantly located within the Chichester subregion. The Chichester subregion is characterised by undulating Archean granite and basalt plains (Kendrick and Mckenzie, 2001b). The Fortescue Plains subregion is alluvial with river frontages, extensive saltmarsh, mulga-bunch grass and short-grass communities (Kendrick and Mckenzie, 2001a). In the broader context of the soils and landscapes locally and within the Pilbara landscape regionally the characteristics of the Chichester and Fortescue subregions are well represented.

10.3.4.2 Landforms

The Landloch (2025) desktop assessment provides a review of the following within the Landforms Survey Area (Appendix T):

- Land resources mapping,
- Atlas of Australian soils, including ASS
- Nullagine Iron Ore Project Soils Report,
- Topography and relief,
- Vegetation communities,
- Terrestrial vertebrate fauna, and
- Cultural Heritage areas.

Based on assessment of land systems mapping, elevation, slope, vegetation mapping, and fauna habitat mapping, Landloch (2025) identified seven landform units within the DE.



A description of the landform units within the DE is provided in Table 10-4 and shown in Figure 10-3.



[This page has been left blank intentionally]



Table 10-4: Landforms within the Development Envelope (Landloch, 2025)

Landform unit	Description	Associated landforms	Main associated vegetation types (as per Chapter 7)	Associated habitat type (as per Chapter 8)	Extent within DE (ha)	Extent within IDF (ha)
Stony plains	<p>Stony plains occur across various elevations and between other landform units.</p> <p>A significant vegetation type VfAI (associated with the four plant assemblages of the Wona Land System PEC (Priority 1, Priority 3)) occurs in this landform unit however only in small areas and is not considered to be significant.</p> <p>Stony plains provide supporting habitat for various significant fauna species within the DE.</p> <p>A number of ethnographic and archaeological heritage sites occur across the stony plains.</p> <p>This landform unit is not considered to be unique to the DE, as it is present throughout the Pilbara. Therefore, the stony plains landform unit is unlikely to be a significant landform.</p>	Stony plains and interfluves, stony plains and slopes, gravelly plains, stony upper plains and rises, hardpan plains, gravelly hardpan plains, saline stony plains.	AaCpTw, AaEp, AaTe, AiCpTe1, AiCpTe2, AiSgTb, EIAbTI	Plain (stony/gibber)	56,405.46	665.69
Upper erosional surfaces	<p>The upper erosional surfaces comprise plateaux, mesas, upper slopes and breakaways. The landform unit is found throughout the DE.</p> <p>The mesas within the upper erosional surfaces landform unit are a potentially significant landform as they provide potential fauna habitat.</p> <p>Banded Iron Formations (BIFs) within the upper erosional surfaces landform unit are a potentially significant landform as they have environmental and economic values, supporting unique ecosystems.</p> <p>The presence of caves within the gorges and gullies of the upper erosional surfaces landform unit are a potentially significant landform as they provide potential habitat for significant fauna.</p>	Hills, ridges, plateaux, mesas, breakaways, buttes, mountains and hills.	AiCpTe1, AiCpTe2, AiSgTb, EIGwTe	Hills/ranges/plateaux, rocky escarpments, gorges/gullies	5,287.50	46.79



Landform unit	Description	Associated landforms	Main associated vegetation types (as per Chapter 7)	Associated habitat type (as per Chapter 8)	Extent within DE (ha)	Extent within IDF (ha)
	<p>A number of landforms within the landform unit are considered to be culturally significant. This may potentially include a number of caves occurring within gorges, gullies and ridges. There is potential for such features to occur where erosional landform elements interact with drainage lines and floors.</p> <p>The upper erosional surfaces landform unit is potentially a significant landform.</p>					
Gilgai plains	<p>Gilgai plains are associated with self-mulching cracking clay soils and occur in close proximity to the stony plains, and hills and rises landform units.</p> <p>A significant vegetation type VfAI (associated with the four plant assemblages of the Wona Land System PEC (Priority 1, Priority 3)) is associated with the gilgai plains.</p> <p>One of the central gilgai plains is associated with a large cultural heritage area.</p> <p>The association with the VfAI vegetation type and relative low abundance of gilgai plains throughout the Pilbara suggests that this landform unit is potentially significant.</p>	Gilgai plains, stony gilgai plains, Stony gilgai upland plains.	AaEp, AaTe, AaTs, VfAI	Plain (cracking clay), woodland (closed), woodland (open)	6,462.76	98.14
Hills and rises	<p>Hills and rises occur throughout the DE, typically above the stony plains and gilgai plains.</p> <p>As erosional landforms, the hills and rises may provide some scientifically significant insight into past geological processes.</p> <p>This landform unit is not considered to be unique to the DE, as it is present throughout the Pilbara. Therefore, the hills and rises landform unit is unlikely to be a significant landform.</p>	Hills, low rises, low basalt hills, low rises.	AeTe, AiCpTe1, AiCpTe2, AiSgTb, AmTe, EIAbTI, EIGwTe	Granite outcrops	11,749.32	97.06



Landform unit	Description	Associated landforms	Main associated vegetation types (as per Chapter 7)	Associated habitat type (as per Chapter 8)	Extent within DE (ha)	Extent within IDF (ha)
Lower slopes	<p>Lower slopes occur throughout the DE and are found down from the upper slopes of the upper erosional surfaces' landform units. The lower slopes are also associated with the hills and rises, stony plains, and drainage lines and floors landform units.</p> <p>A small number of archaeological and ethnographical cultural sites occur within this landform unit.</p> <p>The lower slopes landform unit is unlikely to be a significant landform.</p>	Lower slopes, lower footslopes, mesa footslopes and dissected slopes.	AmTe, ElGwTe	N/A	4,968.16	32.15
Drainage lines and floors	<p>A number of major drainage channels occur throughout the DE, the largest of which is the Nullagine River found in the eastern region of the DE. The Nullagine River is the only drainage lines and floors unit within the DE which is also associated with the floodplains and terraces landform unit. Typically, the drainage lines and floors are associated with the stony plains landform unit. In the north of the DE this landform unit is associated with the upper erosional surfaces landform unit.</p> <p>The drainage lines and floors have cultural significance and are therefore a potentially significant landform.</p> <p>The drainage lines and floors are considered rare, and Nullagine River and Bonnie Creek are potentially significant within the regional setting.</p> <p>The drainage lines and floors landform unit is potentially a significant landform.</p>	Upper drainage lines, drainage lines, drainage floors and channels, minor and major channels, narrow drainage floors and channels, sluggish drainage tracts, channelled drainage tracts, drainage foci. Groves, groves and drainage foci.	AcTe, AmTe, EcAcCs, ElAbTI, EvAcCc	Drainage line/river/creek (minor), drainage line/river/creek (major), gorges/gullies	3,804.06	4.24
Floodplains and terraces	<p>Within the DE, floodplains and terraces occur exclusively in association with the Nullagine River, a specific landform within the drainage lines and floors unit. As these landforms are depositional there is little evidence of past ecological processes.</p>	Sandy levees and sand sheets, upper and lower terraces, floodplains.	AmTe	N/A	1,296.58	0.00



Landform unit	Description	Associated landforms	Main associated vegetation types (as per Chapter 7)	Associated habitat type (as per Chapter 8)	Extent within DE (ha)	Extent within IDF (ha)
	The floodplains and terraces landform unit is unlikely to be a significant landform.					



[This page has been left blank intentionally]



- Legend**
- | | |
|--|---------------------------|
| Development Envelope | Landform Units |
| GOV Towns | Drainage lines and floors |
| Major Roads | Erosional landform unit |
| Fortescue Rail | Floodplains and terraces |
| Roy Hill Rail | Gilgai plains |
| Indicative Disturbance Footprint | Hills and rises |
| Approved Disturbance (Nullagine Pilot Wind Farm) | Lower slopes |
| | Stony Plains |

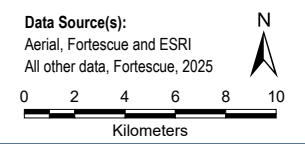


Figure 10-3
Landforms
 within the Development Envelope

Requested By: R. Dorji	Date: 1/30/2026
Drawn By: R. Kerr	Size: A4L
Revised By: rykerr	Revision: 0
Approved By:	Confidentiality: 0
Scale: 1:300,000	
Coordinate System: GDA 1994 MGA Zone 50	
Project Name: 4519OP002_MP_EN_0093_PartIV_3	
Document Name: 4519OP002_MP_EN_0093_037_r0_Landforms	

Fortescue accepts no liability and gives no representation or warranty, express or implied, as to the information provided including its accuracy, completeness, merchantability or fitness for purpose.



[This page has been left blank intentionally]



10.3.4.3 Significant Landforms

Significant landforms are those which have distinctive geology and morphology. As described in Table 10-3, the significance of landforms is assessed in terms of variety, integrity, ecological importance, scientific value, rarity and social importance (EPA, 2018b). Landloch (2025) assessed which of the landform units within the DE are considered potentially significant as per the EPA guidelines (EPA, 2018b). The landform units that contain landforms that are considered potentially significant are:

- Upper erosional surfaces,
- Gilgai plains, and
- Drainage lines and floors.

An assessment of the significance of these landform units against the EPA (2018b) criteria is provided below and in Table 10-5. The Fortescue Marsh (located 9.3 km south of the DE) is also considered an important landform and is assessed below.

The remainder of the landform units in Table 10-4 are not considered to be significant and their assessment of significance is provided in Appendix T.

Upper erosional surfaces

The mesas within the upper erosional surfaces landform unit within the DE are a potentially significant landform (Landloch, 2025). Mesas are common in the Pilbara region and within the DE. They provide important environmental values, including habitat for subterranean fauna and SREs. SREs typically have limited dispersal capabilities resulting in small populations which are isolated from each other by geographic features, with prolonged isolation resulting in speciation between populations (Harvey *et al.*, 2011). Fauna habitats are discussed further in Chapter 8. Mesas are associated with various geological types and holds significant mineral resource value (EPA, 2018b). The DE intersects mesas over a cumulative total of 1,372.18 ha which represents 1.53% of the total area of the DE.

The mesas and plateaux of the upper erosional surface landform unit have an association with BIFs which are a potentially significant landform (Landloch, 2025). BIFs are ancient rock formations, characteristic of the Pilbara region, with environmental and economic value (Gibson *et al.*, 2007). BIFs are composed of iron-rich minerals and silica and are crucial in supporting unique ecosystems such as habitats for subterranean fauna and specialised vegetation.

Additionally, gorges and gullies occur within this landform unit, which have ecological and cultural significance as they provide habitats for significant fauna (as described in Chapter 8) (Landloch, 2025). The presence of caves occurs at breakaways and gorges and gullies. Caves and cave systems are ecologically significant features in the Pilbara region (Landloch, 2025). Mesas and BIFs commonly host caves, cave systems and overhangs, and provide habitat for species including the PLNB. However, targeted surveys have not identified any suitable roost caves for this species within the DE. Habitat considerations for the PLNB are further discussed in Chapter 8. Both caves, and gorges and gullies occur throughout the Pilbara and are not regionally unique to the DE (Landloch, 2025).



Rocky escarpments occur within the upper erosional surface landform unit, and provide habitat for the following significant species:

- Northern Quoll (Critical Habitat),
- Pilbara Olive Python (Critical Habitat),
- Peregrine Falcon (Critical Habitat),
- PLNB (Critical Habitat),
- Ghost Bat (Critical Habitat),
- Grey Falcon (Supporting Habitat),
- Western Pebble Mound Mouse (Supporting Habitat),
- Long-tailed Dunnart (Supporting Habitat), and
- Oriental Plover (Supporting Habitat).

Refer to Chapter 8 for further information on these species.

As shown in Table 10-5, upper erosional surfaces are potentially significant due to their ecological, scientific and social importance (Landloch, 2025).

Gilgai plains

The gilgai plains of the DE are potentially significant due to their association with vegetation type VfAl (associated with the four plant assemblages of the Wona Land System PEC (Priority 1, Priority 3)) (Landloch, 2025). See Chapter 7 for further information on this PEC. One of the central gilgai plains is associated with a large ethnographic cultural heritage area, though no consistent relationship between the gilgai plains and cultural heritage exists (Landloch, 2025). The gilgai plains are uncommon within the regional setting, occurring across approximately 7.18% of the DE. As shown in Table 10-5, the gilgai plains landform unit is potentially significant due to ecological importance and rarity.

Drainage lines and floors

Significant landforms may occur in the drainage lines and floors landform unit. A number of major drainage channels occur throughout the DE, the largest of which is the Nullagine River found in the eastern region of the DE. Major drainage channels within the DE such as the Nullagine River and Bonnie Creek occur sparingly across the Pilbara and are potentially significant within the regional setting (Landloch, 2025). Creeks and rivers form an integral part of the drainage lines and floors landform unit. Many ethnographic heritage sites identified within the DE are closely associated with waterways, reflecting their cultural importance (Landloch, 2025).

As shown in Table 10-5, the drainage lines and floors landform unit is considered potentially significant due ecological and social importance.



Fortescue Marsh

Fortescue Marsh is a Priority 1 PEC which is located approximately 9.3 km south of the DE and is recognised as a nationally important wetland due to its high conservation, cultural and heritage values (DBCA, 2024e). Refer to Section 10.1 and Chapter 7 - Flora and Vegetation for further information on the Fortescue Marsh. It should be noted that the turbines and associated infrastructure are located approximately 29 km from the Fortescue Marsh and Christmas Creek mine is located between the DE and the Fortescue Marsh. No impacts associated with the Fortescue Marsh are anticipated from the Proposal.



[This page has been left blank intentionally]



Assessment of Landform Significance

The assessment of landform significance against the EPA (2018b) criteria is provided in Table 10-5. The remainder of the land units in the DE (as described in Table 10-4) are not considered to be significant and their assessment of significance is provided in Appendix T.

Table 10-5: Assessment of Landform Significance (Landloch, 2025)

Landform unit	Criteria for determining whether a landform is significant (EPA, 2018b)						Significance
	Variety	Integrity	Ecological importance	Scientific importance	Rarity	Social importance	
Upper erosional surfaces	The erosional landforms are typically well represented locally and regionally. This landform unit covers 5,287.50 ha of the DE.	The upper erosional surfaces are typically intact and in varied condition at the local level. Disturbance is associated with the Nullagine Iron Ore mine. The northern landforms are undisturbed.	Provides critical habitat a number of significant fauna species.	Erosional landforms may provide insight into past geological processes.	Present across multiple land systems within the Pilbara. Individual landforms such as caves and gorges have potential to be rare.	Various sites of cultural significance associated with this landform unit.	Potentially significant
Gilgai plains	The gilgai plains are typically well represented locally and regionally. This landform unit covers 6,462.76 ha of the DE.	The gilgai plains are intact and in good condition at the local level.	The gilgai plains is associated with VfAI, which is associated with the four plant assemblages of the Wona Land System PEC (Priority 1, Priority 3).	Predominantly depositional landform, as such there is little evidence of past ecological processes.	Uncommon within the regional setting. Occurring across approximately 7.18% of the DE.	One of the central gilgai plains occurs within a single large ethnographic cultural heritage area, though no consistent relationship between the gilgai plains and	Potentially significant



Criteria for determining whether a landform is significant (EPA, 2018b)							
Landform unit	Variety	Integrity	Ecological importance	Scientific importance	Rarity	Social importance	Significance
						cultural heritage exists.	
Drainage lines and floors	The drainage line and floors are typically well represented locally and regionally. This landform unit covers 3,804.06 ha of the DE.	The drainage lines and floors are intact and in good condition at the local level.	Major channels likely to be significant watercourses for the region.	Depositional landform, as such there is little evidence of past ecological processes.	Minor lines and floors occur extensively within the Pilbara. Major channels are less common.	Drainage lines are considered culturally sensitive.	Potentially significant



10.3.5 Potential Impacts and Mitigation

Impacts to potentially significant landforms from implementation of the Proposal will primarily occur as a result of clearing of vegetation and construction. Implementation of the Proposal may result in the following impacts:

- Clearing of up to 46.79 ha associated with the upper erosional surfaces landform unit within the IDF, which accounts for 0.88% of the landform unit identified within the DE,
- Clearing of up to 98.14 ha associated with the gilgai plains landform unit within the IDF, which accounts for 1.52% of the landform unit identified within the DE,
- Clearing of up to 4.24 ha associated with the drainage lines and floors landform unit within the IDF, which accounts for 0.11% of the landform unit identified within the DE,
- The Proposal will result in visual changes to the landscape due to landform clearing and associated construction activities. Visual Impact Assessments have been conducted, with findings discussed in Chapter 9, and
- There is potential to impact the cultural heritage values associated with the mesas and BIFs within the upper erosional surfaces landform unit. Cultural heritage considerations, particularly those associated with clearing of mesas, are further addressed in Chapter 9.

Mitigation measures were considered during the Proposal's design process to avoid and minimise impacts to significant landforms where possible, including:

- All turbine pads have been specifically located to avoid mesas and significant drainage lines, ensuring that the Proposal does not impact the physical integrity or visual landscape of these landforms, and
- Fortescue is committed to minimising impacts on Heritage Places in all of its project areas which includes avoidance of impacts on Heritage Places wherever possible.

Where avoidance is not possible, the following measures will be implemented to mitigate and minimise impacts:

- All clearing areas will be marked and/or GPS recorded according to Fortescue's internal Land Use Certificate system clearing process prior to clearing, then checked and confirmed post-clearing through inspection of aerial imagery of clearing areas and comparison to the IDF,
- Rehabilitation efforts will focus on restoring flora and vegetation values of the landform units. Rehabilitation of temporary clearing is further discussed in Chapter 7, and
- Clearing of SRE habitat will be avoided where possible and otherwise minimised including within the upper erosional surfaces landform unit. Any potential impacts to SREs are discussed further in Chapter 8.



10.3.6 Residual Impact and Predicted Outcome

No significant impacts are anticipated as a result of construction or operation of the Proposal with regard to landforms. The Fortescue Marsh is sufficiently distant from the Proposal (approximately 29km from the Proposal infrastructure) that impacts to this important landform are unlikely.

All turbine pads have been located to avoid impacting mesas and significant drainage lines. Ecological values associated with mesas and BIFs such as flora and vegetation and SRE species are not anticipated to be significantly impacted due to the limited extent of these landforms within the IDF.

With the implementation of mitigation measures listed above, no significant residual impacts to Landforms are anticipated and the EPA's objective for the Landforms factor "*to maintain the variety and integrity of significant physical landforms so that environmental values are protected*" (EPA, 2018b) can be met.



11 HOLISTIC IMPACT ASSESSMENT

The EIA process needs to consider the benefits and impacts of the Proposal in a holistic manner. As noted in the EPA's guidance, where the combination of environmental effects of two or more environmental factors has the potential to result in a significant impact, a holistic impact assessment should consider how these factors interact through the application of the EPA's objectives for environmental factors.

The Proposal's predicted impacts have been considered independently against each of the EPA's environmental factors and in relation to the EPA's environmental principles in previous sections of this ERD. Fortescue recognises there are complex linkages between Flora and Vegetation, Terrestrial Fauna, Social Surroundings, Inland Waters, Terrestrial Environmental Quality, and Landforms. These connections are illustrated in Plate 11-1. A holistic impact assessment has been undertaken in this chapter to determine if these interactions could result in a significant impact.

11.1 Assessment Approach

The following process has been implemented to determine and assess the holistic impacts of the Proposal:

1. Identify connections and interactions between environmental factors (Plate 11-1),
2. Identification of holistic impacts:
 - a) Where a potential impact(s) has been completely avoided, it will not contribute to holistic impacts,
 - b) Where a predicted impact is considered likely to affect only one factor it is unlikely to contribute to holistic impacts and additional mitigation measures are not required,
 - c) Where an activity has been considered to likely result in a significant impact across two or more factors, and the mitigation hierarchy has been applied in isolation per factor, consideration will be given if further measures are required to mitigate this combined impact,
 - d) Where there are multiple overlapping minor impacts, or a minor impact affects multiple values and has been assessed as insignificant in the context of an individual factor, these may require further holistic consideration, and
 - e) The environmental principles of intergenerational equity, and conservation of biological diversity and ecological integrity are considered the most relevant and have been a foundation when considering potential significance of the holistic impact of the Proposal.



[This page has been left blank intentionally]

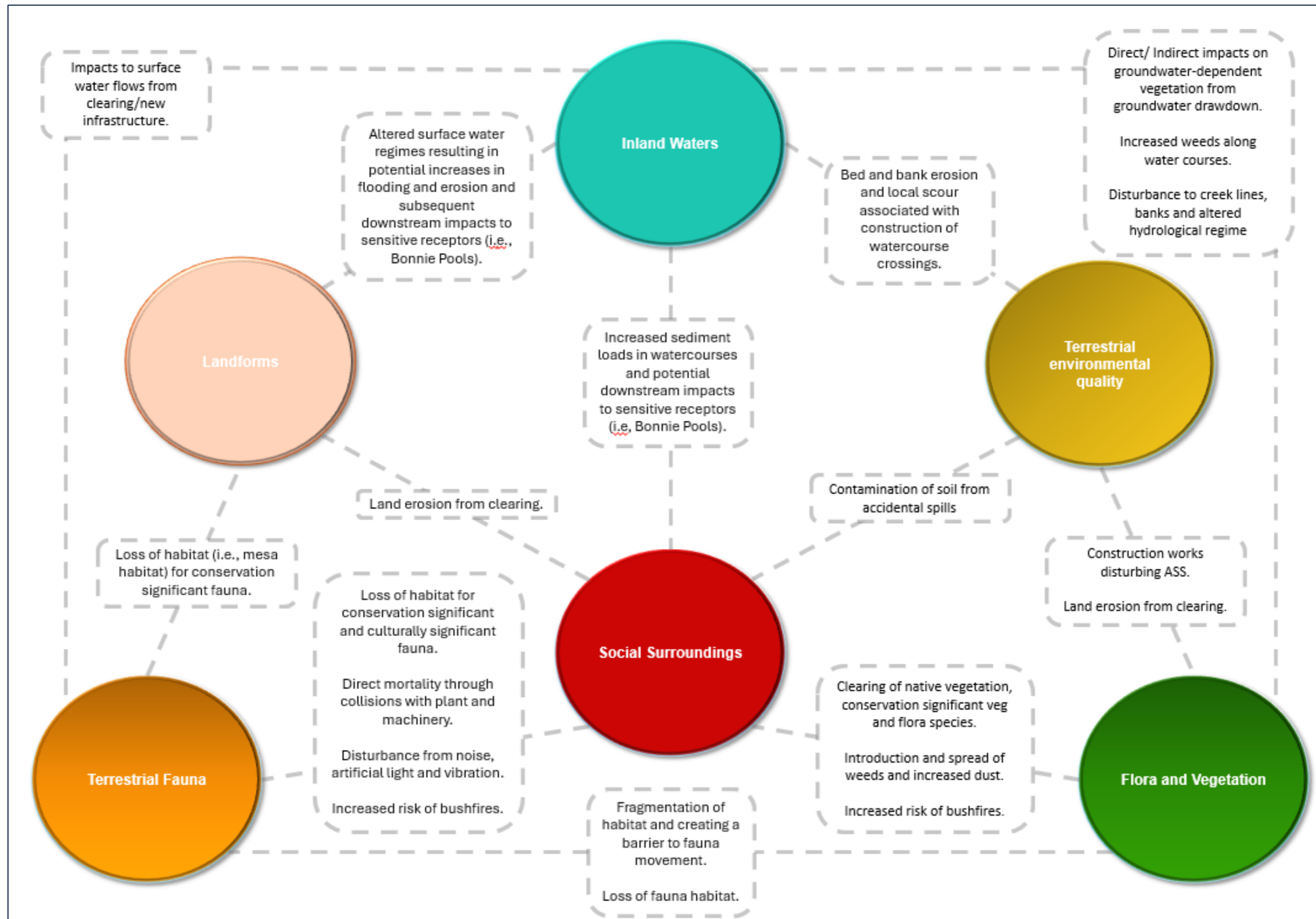


Plate 11-1: Intrinsic Interactions Between Environmental Factors



[This page has been left blank intentionally]



11.2 Consideration of Holistic Impacts

By understanding the intricate connections between environmental factors identified in Plate 11-1, we can assess how changes in one aspect of the environment cascade through others, creating combined and sometimes compounding impacts on the same receptors.

The key Proposal activities likely to result in impacts across multiple environmental factors and combined impacts to environmental receptors are:

- Vegetation and land clearing,
- General Construction and Maintenance Activities, and
- Works Affecting Watercourses and Groundwater Abstraction.

These are discussed in further detail in Section 11.2.1 to 11.2.3. Table 11-1 summarises the relevant holistic impacts associated with construction and operation of the Proposal.

11.2.1 Vegetation and Land Clearing

The Proposal will require permanent clearing of 427.5 ha of 'Good to Excellent' condition native vegetation. The combined impacts associated with vegetation clearing include:

- Loss of Priority flora and supporting habitat (Flora and Vegetation),
- Loss of culturally significant flora (Flora and Vegetation, and Social Surroundings),
- Loss of habitat (including mesa habitat) and habitat fragmentation for conservation significant and culturally significant fauna species (Terrestrial Fauna, Landforms and Social Surroundings),
- Direct fauna mortality through collisions with plant and machinery (Terrestrial Fauna and Social Surroundings),
- Altered surface water regimes resulting in potential increases in flooding and erosion events, loss in catchment area, and subsequent impact on downstream values such as Bonnie Pools (Inland Waters, Landforms and Social Surroundings),
- Increased sediment loads in watercourses and potential downstream impacts to sensitive areas from water quality impacts, such as Bonnie Pools (Inland Waters and Social Surroundings), and
- Introduction and spread of weeds which can outcompete conservation and culturally significant flora, reduce the quality of fauna habitat, increase feral herbivore activity and increase the risk of bushfires (Flora and Vegetation, Social Surroundings and Terrestrial Fauna).

Therefore, through the clearing of vegetation, which primarily affects Flora and Vegetation, the Proposal has the potential to result in impacts to Terrestrial Fauna by removing and altering fauna habitat, or direct mortality through collision with construction machinery. Clearing of vegetation may also impact inland waters, with impacts to the hydrology of surface water features surrounding the Proposal through altering surface water flow paths or volumes,



through increased sediment loads and through erosion of watercourse banks. Impacts to Social Surroundings may arise from these impacts to Terrestrial Fauna and watercourses, in particular on Aboriginal cultural heritage values, given the cultural significance of watercourses (including Bonnie Pool) and fauna occurring in the DE.

Vegetation units and vegetation associations, as per Beard *et al.*, (2013) will not be cleared to an extent that will reduce the remaining vegetation below 30%, with over 98% of all vegetation associations remaining at the State level, Pilbara IBRA bioregional and Chichester subregional levels, of the Local Government Area (Shire of East Pilbara). Therefore, clearing of vegetation for this Proposal will not lead to compounding impacts at a regional scale that would result in significant effects on the identified environmental values and their connections, including the provision of habitat for conservation and culturally significant flora and fauna species.

The longer-term impacts of the Proposal to both Flora and Vegetation and Terrestrial Fauna will be predominantly mitigated through progressive and post-construction rehabilitation, which seeks to restore environmental values impacted throughout the implementation of the Proposal. Application of offsets will counterbalance potential operational impacts and residual significant construction impacts, while successful rehabilitation following construction and decommissioning will mitigate long-term effects on vegetation communities and fauna habitats. This, in turn, will minimise potential long-term impacts to fauna of cultural significance to the Traditional Owners.

Vegetation clearing can lead to changes in overland (surface water runoff) flow paths and quantities and quality of runoff entering waterways, which are considered culturally significant within the DE. The potential for changes to overland flows as a result of vegetation clearing for the Proposal is considered to be low, due to the nature and scale of the Proposal within the wider landscape. Vegetation clearing will be narrow and predominantly linear in nature, thereby reducing the extent of unimpeded overland flows adjacent to waterways. To minimise the potential for erosion and destabilised banks, vegetation removal adjacent to the banks has been reduced through avoidance measures during the design process. As detailed in Chapter 10.1, the turbine and associated hardstand areas/supporting infrastructure have been designed outside of the 1% AEP floodplain area. Therefore, downstream impacts on sensitive receptors (including Bonnie Pool) are expected to be negligible (Fortescue, 2025; Fortescue, 2024). Further measures to control sediment runoff during the construction phase are outlined in Section 10.1.6.3 and will be considered in the Construction Environment Management Plan (CEMP) to be produced by the appointed contractor. Further areas that do not require permanent clearing will be progressively rehabilitated throughout construction. As such, potential for erosion impacts are considered minimal.

Changes to surface water flow paths, quantity, and quality can harm riparian vegetation health and, due to the cultural significance of Bonnie Pools and creeks within the DE, may result in a broader impact on Social Surroundings. Impacts to riparian vegetation through changes to surface water quality and flows have been assessed in Section 10.1.5. Impacts were determined to be not significant, as the Proposal's potential impacts on surface water flow are expected to be localised, mainly associated with turbine access tracks and waterway crossings, with negligible disruptions to regional flows downstream. In addition, the major creek crossings have been engineered to maintain natural flow paths as far as possible through the iterative design process undertaken, and the locations were selected through consultation with Traditional Owners as the areas with minimal potential cultural impacts.



Clearing activities and associated vehicle movements can introduce invasive plant species. These weeds can outcompete native flora species, leading to reduced plant diversity and altered habitat structure. High weed coverage can alter fire regimes by increasing flammable biomass, which may increase the frequency and intensity of bushfires, further degrading vegetation and habitat quality for flora and fauna. High weed coverage can also impact Inland Waters, if weeds spread along creeks and drainage lines. It is anticipated that the introduction and spread of weeds will be adequately controlled during the construction and operations phase through the implementation of specific weed management measures. With, all works to be undertaken in accordance with Fortescue's Weed Management Plan (Reference: 45-PL-EN-0033), provided in Appendix E, as the standard operating procedure, such that no significant holistic impacts would occur across the impacted environmental factors.

Overall, the proposed mitigation and management measures for each environmental factor, as summarised in Table 11-1, along with offsets to address impacts on Flora and Vegetation, will ensure that impacts on other environmental factors, including Terrestrial Fauna, Social Surroundings, and Inland Waters, align with the EPA's environmental objectives.

11.2.2 General Construction and Operational Maintenance Activities

The construction period for the Proposal is anticipated to take up to 34 months. Combined impacts resulting from vegetation clearing during construction are addressed above. Other construction activities (such as operation of plant and machinery, earthworks, and installation of infrastructure), and to a lesser extent some operational maintenance activities, can simultaneously increase noise, dust and artificial light emissions, increase the risk of spills and attract feral fauna to the DE, resulting in combined impacts to Terrestrial Fauna, Flora and Vegetation, Inland Waters, Terrestrial Environmental Quality and Social Surroundings. General construction activities can lead to the following combined impacts:

- Disturbance to fauna and cultural values from noise and vibration (Terrestrial Fauna and Social Surroundings),
- Increased dust emissions generated during construction can settle on plants, affecting the health of flora and vegetation of conservation and cultural significance (Flora and Vegetation, and Social Surroundings),
- Attraction of feral animals causing impacts to flora and vegetation, and terrestrial fauna of conservation and cultural significance through predation, competition and degradation of habitat (Flora and Vegetation, Terrestrial Fauna and Social Surroundings),
- Disturbance of fauna and Social Surroundings from artificial lighting (Terrestrial Fauna and Social Surroundings), and
- Contamination of soil and watercourses through accidental spills (Flora and Vegetation, Terrestrial Fauna, Terrestrial Environmental Quality, Inland Waters and Social Surroundings).

Holistic impacts on Flora and Vegetation, Terrestrial Fauna and Social Surroundings receptors may arise from combined disturbances during construction, including noise and vibration, artificial lighting, and increased dust emissions. Noise, vibration and light emissions can cause fauna to avoid certain areas, and given the cultural significance of some species (as discussed in Chapter 8), this may affect the Traditional Owners' abilities to continue their traditional use



of/practices on country. Dust emissions can settle on plants and affect the health of flora and vegetation, and given the cultural significance of some species, this may also impact Traditional Owners' ability to use these species. However, with the implementation of the mitigation measures in Chapter 9, the CEMP produced by the appointed contractor and the mitigation measures outlined in Table 11-1, potential impacts of noise, vibration, lighting and dust will be minimised to a level where they are not considered significant, either individually or holistically. In addition, any impacts from disturbance during construction will be temporary, for intermittent periods, and therefore no long-term significant holistic impacts on surrounding receptors are likely.

Attraction of feral animals due to construction activities may degrade flora and vegetation quality and impact fauna through predation, competition and degradation of habitat. Given the cultural significance of some flora and fauna species (as discussed in Chapter 9), this may affect the Traditional Owners' abilities to continue their traditional use of/practices on country.

Construction activities have the potential to impact on Terrestrial Environmental Quality and Inland Waters through accidental contamination incidents. This could lead to holistic impacts on Social Surroundings given the cultural value of Bonnie Pools and creeks within the DE. Should the water quality be impacted, it could affect the Traditional Owners' spiritual and physical connection to the land. It could also impact fauna or vegetation that rely on these watercourses. Similarly, the Stormwater Management Plan will include pollution prevention measures to minimise the risk of spills and reduce the potential for significant land or water contamination.

Overall, it is considered that the proposed mitigation and management measures, as summarised in Table 11-1, and the implementation of an EMP, will ensure impacts on values that are interconnected between the identified factors are likely to be consistent with the EPA's environmental factor objectives.

11.2.3 Works Affecting Watercourses

Several elements of the Proposal interact with Inland Waters, including construction of watercourse crossings. Inland surface waters are linked to vegetation health, terrestrial fauna (e.g. important for species such as the Pilbara Olive Python) and Social Surroundings (significance for Aboriginal Cultural Heritage). Disruptions to these systems can affect both above ground and below ground biodiversity, as well as social surroundings due to their cultural significance. As discussed in Chapter 10.1, construction and operational water requirements will be supplied from the existing borefield, approved under GWL171278(7). Therefore, as groundwater abstraction has already been accounted for, this aspect of Inland Waters is not considered here. The combined impacts associated with works affecting water resources include:

- When disturbed, ASS can release sulfuric acid, lowering pH levels in surface waters. This can lead to toxic conditions that harm aquatic life and reduce soil fertility. Acidification can leach heavy metals into waterways, contaminating drinking water supplies and affecting both terrestrial and aquatic organisms (Inland Waters, Flora and Vegetation, Social Surroundings and Terrestrial Fauna),
- The construction of watercourse crossings or other infrastructure can alter natural water drainage patterns or increase erosion rates (Inland Waters, Social Surroundings, Landforms and Terrestrial Environmental Quality), and



- Impacts to watercourses can affect Traditional Owners' spiritual and physical connection to the land due to the cultural significance of these water resources (Inland Waters and Social Surroundings).

Given the interconnected nature of several environmental factors related to the water resources within the DE, there is potential for combined impacts on receptors associated with all factors considered in this assessment. Changes to the volume or quality of surface water may impact the health of fauna habitat and vegetation, particularly habitats associated with riparian vegetation. The hydrological assessment concluded that the design and layout of the Proposal are expected to have minimal impact on the existing surface water flow regime, with any changes being localised, primarily around turbine access tracks and waterway crossings, and negligible increases in flood depths and velocities. Therefore, effects on surface watercourses are anticipated to be negligible and the associated holistic impacts related to erosion rates, riparian vegetation or cultural significance would not be significant.

The potential impacts from the disturbance of ASS could affect Inland Waters (surface watercourses), Social Surroundings and Terrestrial Environmental Quality, leading to holistic impacts on these receptors. The mobilisation of ASS in the DE could degrade the water quality of the creeks, potentially affecting the Traditional Owners' spiritual and physical connection to the land due to the cultural significance of the watercourses. This could also affect fauna that rely on the watercourse and negatively impact vegetation health. The mitigation measures outlined in Section 10.2.5, and subsequent CEMP produced by the appointed contractor, during construction will minimise impacts to a level where they are not considered significant, either individually or holistically.

11.2.4 Holistic Impact Assessment Summary

Overall, it is considered that the proposed mitigation and management measures (Table 11-1) together with conditions from other approval instruments, such as the Groundwater Licence under the RIWI Act, will ensure that impacts on interconnected environmental factors, including the values associated with Terrestrial Fauna, Landforms, Terrestrial Environmental Quality, Social Surroundings, Flora and Vegetation, and Inland Waters, are likely to align with the EPA's environmental factor objectives.



[This page has been left blank intentionally]



Table 11-1: Holistic Impact Assessment Summary

Proposal activity	Holistic impacts	Mitigation and management measures	Offsets relevant?	EPA objective achieved?	Additional mitigation required for holistic impact?
Vegetation and land clearing	<ul style="list-style-type: none"> • Loss of Priority flora and supporting habitat. • Loss of culturally significant flora. • Loss of habitat (including mesa habitat) and habitat fragmentation for conservation significant and culturally significant fauna species. • Direct fauna mortality through collisions with construction and operational plant and machinery. • Altered surface water regimes resulting in a potential increase in flooding and erosion events, loss in catchment area. • Introduction and spread of weeds, outcompeting flora and fauna and increasing risk of bushfires. 	<ul style="list-style-type: none"> • Where significant flora or vegetation occurs close to the IDF clearing areas will be demarcated prior to construction activities to protect the conservation significant flora species and vegetation from impacts such as accidental clearing or disturbance (Chapter 7). • Areas to be cleared will be demarcated on the ground (either physically or using GPS enabled methods) (Chapter 7). • Comprehensive weed hygiene management through implementation of specific weed management measures. With, all works to be undertaken in accordance with Fortescue’s Weed Management Plan (Reference: 45-PL-EN-0033) as the standard operating procedure (Chapter 7). • Strict speed limits will be enforced during dawn and dusk in order to avoid fauna strikes during clearing and construction (Chapter 8). 480.81 ha (this includes 13.94 ha of areas previously cleared by other activities not related to this Proposal) will be progressively rehabilitated once construction is complete to reduce impacts to floral and vegetation over time, including potential fragmentation (in accordance with Fortescue’s standard procedures including Rehabilitation and Revegetation 	Yes - monetary contribution will be made into the Pilbara Environmental Offset Fund.	Yes – When considered holistically, the likely environmental effects from the Proposal will not result in combined environmental effects that significantly impact the environment as a whole.	No



Proposal activity	Holistic impacts	Mitigation and management measures	Offsets relevant?	EPA objective achieved?	Additional mitigation required for holistic impact?
		Monitoring Procedure (Reference: 45-GU-EN-0009) (Chapter 7).			
Disturbance from construction and operational maintenance activities	<ul style="list-style-type: none"> • Disturbance to fauna and social surroundings from noise and vibration. • Increased dust emissions generated during construction can settle on plants, affecting the health of flora and vegetation of conservation and cultural significance. • Attraction of feral animals causing impacts to flora and vegetation, and terrestrial fauna of conservation and cultural significance through predation, competition and degradation of habitat. • Disturbance of fauna and areas of cultural significance from artificial lighting. • Contamination of soil and watercourses through accidental spills. 	<ul style="list-style-type: none"> • Dust deposition will be managed through standard construction measures (e.g., water application) to minimise dust generation and avoid impacts on vegetation in line with standard dust management measures (Chapter 7). • All food waste will be removed from site at the end of each shift. Waste will be stored at the depot and regularly removed to minimise attraction of feral animals (Chapter 8). • Lighting will be designed and managed in accordance with the National Light Pollution Guidelines for Wildlife (DCCEEW, 2023c) (Chapter 8). • Standard construction noise management measures will be implemented (Chapter 8), including: <ul style="list-style-type: none"> ○ Machinery and vehicles are regularly serviced and operated/maintained in accordance with the manufacturer's specifications, and preferential use of modern equipment that generally operate more quietly. ○ Using techniques that reduce noise, such as employing hydraulic, rather than impact, methods. Training workers on best practices for minimising noise. 	No	Yes – When considered holistically, the likely environmental effects from the Proposal will not result in combined environmental effects that significantly impact the environment as a whole.	No



Proposal activity	Holistic impacts	Mitigation and management measures	Offsets relevant?	EPA objective achieved?	Additional mitigation required for holistic impact?
		<ul style="list-style-type: none"> ○ Plant and machinery on site will be switched off and not left idling when not in use. • Scheduling the construction activities to ensure the noisiest tasks occur during times that will cause the least disturbance. • Undertake blasting activities in accordance with Fortescue's Blasting Near Heritage Place Procedure (100-PR-HE-0003) (Chapter 9). • Any identified ASS will be managed in accordance with 'Treatment and management of soil and water in acid sulfate soil landscapes' (DWER, 2015) (Chapter 10). • Spills will be managed through standard site pollution prevention measures (Chapter 10). 			
Works affecting watercourses	<ul style="list-style-type: none"> • When disturbed, ASS can affect quality of surface waters. This can lead to toxic conditions that harm aquatic life and reduce soil fertility, affecting both terrestrial and aquatic organisms. • The construction of watercourse crossings or other infrastructure can alter natural water drainage patterns or increase erosion rates. 	<ul style="list-style-type: none"> • Culturally significant water sources are recorded in Fortescue's GIS system as Heritage Places or Heritage Restriction Zones (Chapter 9). • Pole and turbine locations located outside of high flow areas, where required to be installed within rivers (Chapter 10). • A surface water management plan will be developed and implemented to manage flood risk and minimise soil erosion and the potential for the transport of sediment 	No	Yes – When considered holistically, the likely environmental effects from the Proposal will not result in combined environmental effects that significantly impact the environment as a whole.	No



Proposal activity	Holistic impacts	Mitigation and management measures	Offsets relevant?	EPA objective achieved?	Additional mitigation required for holistic impact?
	<ul style="list-style-type: none"> Impacts to watercourses can affect Traditional Owners' spiritual and physical connection to the land due to the cultural significance of these water resources. 	<p>to downstream waters during the construction phase (Chapter 10).</p> <ul style="list-style-type: none"> Construction and maintenance of the waterway crossings will be scheduled outside of the wet season where possible, or for a time period when rainfall and runoff are unlikely (Chapter 10). Erosion control measures will be installed at the inlet and outlet of the culvert structures to minimise the risk of bed and bank erosion and local scour, and to prevent undermining of the structures (Chapter 10). The floodway batters and driving surface will be armoured to minimise erosion and scour as water flows over the road (Chapter 10), Permit to be in place prior to interferences with the bed or banks of a watercourse under the RIWI Act, and Clearing of riparian vegetation will be avoided and minimised where possible. 			



12 OFFSETS

12.1 Background

The WA Environmental Offsets Guidelines (GoWA, 2014) defines environmental offsets as *'actions that provide environmental benefits which counterbalance the significant residual environmental impacts or risks of a project or activity'*. Unlike mitigation actions, which are implemented on-site to reduce the direct impacts of the project, offsets are undertaken outside of the project area and counterbalance significant residual impacts.

Environmental offsets are applied when the residual impacts of a project are deemed significant, after efforts to avoid, minimise, and rehabilitate have been exhausted. As outlined in Chapters 7 and 8, the Proposal may result in significant residual impacts on flora and vegetation, as well as terrestrial fauna habitat. In response to these potential impacts, Fortescue intends to implement an environmental offset strategy which is proportionate to the scale and significance of the residual environmental impact.

Fortescue proposes to use the Pilbara Environmental Offsets Fund (PEOF) as the offsets mechanism for the Proposal with the intention of maximising regional biodiversity benefits.

12.2 WA Environmental Offsets Policy

The WA Environmental Offsets Policy (GoWA, 2011) requires the following Principles to be considered when developing an offset proposal:

- Environmental offsets will only be considered after avoidance and mitigation options have been pursued,
- Environmental offsets are not appropriate for all projects,
- Environmental offsets will be cost-effective, as well as relevant and proportionate to the significance of the environmental value being impacted,
- Environmental offsets will be based on sound environmental information and knowledge,
- Environmental offsets will be applied within a framework of adaptive management, and
- Environmental offsets will be focussed on longer term strategic outcomes.

An assessment of the residual impacts of the Proposal as outlined in the Environmental Offset Guidelines (GoWA, 2014) is provided below in Table 12-1.



[This page has been left blank intentionally]



Table 12-1: Residual Impact Significance Model

Residual impact classification	Flora and Vegetation	Terrestrial Fauna
Residual impact that is environmentally unacceptable or cannot be offset	None	None
Significant residual impacts that will require an offset – All significant residual impacts to species and ecosystems protected by statute or where the cumulative impact is already at a critical level	<ul style="list-style-type: none"> Permanent clearing of 427.5 ha of 'Good to Excellent' condition vegetation 	<ul style="list-style-type: none"> Permanent clearing of up to 8.09 ha of habitat that is identified as habitat critical to the survival of the Northern Quoll.
Significant residual impacts that may require an offset – Any significant residual impact to potentially threatened species and ecosystems, areas of high environmental value or where the cumulative impact may reach critical levels if not managed	None	<ul style="list-style-type: none"> Permanent clearing of up to 15.71 ha of habitat that is identified as habitat critical to the survival of the PLNB and Ghost bat.
Residual impacts that are not significant	<ul style="list-style-type: none"> Clearing of 47.94 ha of Regionally Significant vegetation ('Four plant assemblages of the Wona Land System' PEC (P1, P3), Potential 'Four plant assemblages of the Wona Land System' PEC (P1, P3), groundwater dependent vegetation, potential groundwater dependent vegetation, habitat for Priority flora species). Clearing of seven conservation significant flora species, including: <ul style="list-style-type: none"> <i>Dolichocarpa</i> sp. Hamersley Station (A.A. Mitchell PRP 1479) (P3): 23 individuals. <i>Euphorbia inappendiculata</i> var. <i>queenslandica</i> (P3): 72 individuals. <i>Lotasperma sessilifolium</i> (P3): 1 individual. <i>Neptunia longipila</i> (P3): 10 individuals. <i>Paspalidium retiglume</i> (P2): 1 individual. <i>Swainsona thompsoniana</i> (P3): 18 individuals. <i>Ptilotus mollis</i> (P4): 35 individuals. 	<ul style="list-style-type: none"> Loss of 910.26 ha of fauna habitat. Post construction rehabilitation will help re-establish fauna habitat in some disturbed areas. There will be some permanent loss of habitat for drainage line/river/creek (major), drainage line/river/creek (minor), granite outcrops (flat dome), plain (cracking clays), plain (stony/gibber), rocky escarpments (ridges/mesa/cliffs/outcrops/ breakaways), and woodland (open). Given the linear nature of the Proposal, the infrastructure and associated clearing will fragment some areas of habitat. A residual risk of collision with the operational infrastructure with some significant fauna species will remain, including listed Threatened and Migratory bird species.



Residual impact classification	Flora and Vegetation	Terrestrial Fauna
	<ul style="list-style-type: none">○ The Proposal IDF will intersect occurrences of conservation significant flora species.○ The Proposal may indirectly impact three conservation-significant species:<ul style="list-style-type: none">● <i>Paspalidium retiglume</i> (P2): 100 individuals● <i>Euphorbia inappendiculata</i> var. <i>queenslandica</i> (P3): 270 individuals.● <i>Ptilotus mollis</i> (P4): 105 individuals.● As a result of the fragmentation of PEC patches and potential edge effects, 200.83ha of VfAI may be indirectly impacted by the Proposal, including:<ul style="list-style-type: none">● 177.78 ha of 'Four plant assemblages of the Wona Land system' PEC (P1, P3)● 23.05 ha of potential 'Four plant assemblages of the Wona Land system' PEC (P1, P3).	



12.3 Pilbara Environmental Offsets Fund

The Pilbara Conservation Strategy outlines a landscape-scale approach to biodiversity conservation across the Pilbara region and provides strategic direction for conservation actions that may be funded from a variety of sources, including through offsets to counterbalance the residual impacts of infrastructure projects (GoWA, 2023). The top four outcomes that will be delivered through the Pilbara Conservation Strategy are (GoWA, 2023):

1. Landscape-scale conservation through improved management of key threats,
2. Improved condition of threatened and other important species and communities,
3. Evidence-based conservation management, and
4. Conservation through partnerships.

The outcomes “Landscape-scale conservation through improved management of key threats” and “Evidence-based conservation management” are relevant to the significant residual impacts of the Proposal to flora and vegetation, and terrestrial fauna.

Of these outcomes, “Improved condition of threatened and other important species and communities” is of particular relevance to the Proposal and the predicted significant residual impacts resulting from clearing of habitat critical to the survival of the Northern Quoll. The Pilbara Conservation Strategy specifically notes the Northern Quoll, among other species, as one of the species that is the focus of this objective (GoWA, 2017). The clearing of habitat critical to the survival of the PLNB and Ghost Bat is also potentially significant and may require offsetting. The Pilbara Conservation Strategy also outlines a number of priority areas that will be the focus of the projects implemented to meet the objectives of the Strategy.

In July 2016, the WA Government approved the establishment of the Pilbara Strategic Conservation Initiative, now known as the Pilbara Environmental Offsets Fund (the ‘fund’), to maximise the value of environmental offsets from projects in the Pilbara (GoWA, 2023). The fund facilitates the coordinated delivery of environmental offset projects within the Pilbara bioregion of WA. The fund was established to invest in strategic conservation projects in the Pilbara bioregion to improve vegetation and species habitat impacted by development. The fund combines money from individual offset payments required under the WA EP Act and the EPBC Act into a special purpose account. This enables the delivery of larger and more strategic landscape-scale projects than would occur if individual offset projects were delivered independently, leading to better biodiversity conservation outcomes (DWER, 2019).

Fortescue recognises that the effective implementation of offsets in the Pilbara is hampered by the region’s unique land tenure (being all Crown land with overlapping mining, native title and pastoral interests). This makes traditional land acquisition and access for on-ground offset activities difficult. The fund was established to overcome these barriers and as such, Fortescue proposes to use the fund to facilitate offsets for the Proposal. Table 12-2 outlines how the use of fund is consistent with the Principles of the WA Environmental Offsets Policy (GoWA, 2011).



[This page has been left blank intentionally]



Table 12-2: Proposed offset strategy’s consistency with the Principles of the WA Environmental Offsets Policy

Principle	How the proposed offset strategy addresses this
Environmental offsets will only be considered after avoidance and mitigation options have been pursued.	As detailed in Sections 7.6, 8.6, 9.6, and 10, avoidance and mitigation measures have been implemented wherever practicable.
Environmental offsets are not appropriate for all projects.	<p>The Proposal is appropriate for environmental offsets, particularly in light of the availability of the Pilbara Environmental Offset Fund.</p> <p>Fortescue recognises that the effective implementation of offsets in the Pilbara is hampered by the region’s unique land tenure (being all crown land with overlapping mining, native title and pastoral interests). This makes traditional land acquisition and access for on-ground offset activities difficult. The fund was established to overcome these barriers and as such, Fortescue proposes to use the fund to facilitate offsets for the Proposal.</p>
Environmental offsets will be cost-effective, as well as relevant and proportionate to the significance of the environmental value being impacted.	<p>The offset rates paid to the fund are established by DWER and are <i>‘based on the level of biodiversity protection in the region, and cumulative impacts to environmental values, including high quality vegetation and the conservation of significant-species habitat (DWER 2019)’</i>. These rates include base rates for Good to Excellent quality vegetation and ‘higher rates’ for specialised environmental values such as Threatened fauna habitat.</p> <p>It is anticipated that the higher rate will apply to offset clearing of habitat critical to the survival of Northern Quoll in the northern portion of the DE. The higher rate will also apply if offsetting is required for clearing of PLNB and Ghost Bat critical habitat. It is further anticipated that the base rate will apply to offset clearing of vegetation in Good to Excellent condition. As such, it is considered that the proposed offsets are proportionate to the level of statutory protection that applies to the environmental values being impacted.</p>
Environmental offsets will be based on sound environmental information and knowledge.	<p>The fund has an Implementation Plan which outlines the criteria that are used to select projects that are supported through the fund. These criteria include (DWER, 2019):</p> <p><i>“Be designed to align with the offset principles of the Western Australian and Australian governments and the implementation principles in Chapter 2 (of the Implementation Plan) so that the outcomes of projects:</i></p> <ul style="list-style-type: none"> • <i>Tangibly and measurably improve environmental matters,</i> • <i>Are value for money and have a high chance of success,</i> • <i>Are strategic and have landscape-scale outcomes where achievable,</i> • <i>Are long term and enduring (ideally outcomes will endure for at least 20 years), and</i> • <i>Are additional to activities that are already required as a condition of approval or lease or a legislative requirement”</i>



Principle	How the proposed offset strategy addresses this
<p>Environmental offsets will be applied within a framework of adaptive management.</p>	<p>The fund Implementation Plan states that “<i>The fund will be adaptively managed to plan, implement, monitor, evaluate and adjust its delivery over time</i>” (DWER, 2019). The Governance Framework for the fund states that “<i>Evaluation of the strategic objectives, outcomes and priorities of the Implementation Plan will be completed every three years to inform adaptive management of the Fund, consistent with Principle 5 of the WA Offset Policy which is that ‘environmental offsets will be applied within a framework of adaptive management’</i>” (DWER, 2019).</p> <p>Impact Seed (2024) were commissioned by DWER on behalf of the PEOF board to undertake an evaluation of PEOF. This review concluded that there are several complex factors preventing PEOF projects being approved and delivered, and therefore preventing PEOF from achieving its intended environmental outcomes. The following strategic recommendations were identified:</p> <ul style="list-style-type: none"> • “<i>Undertake an options analysis and risk assessment to determine the immediate next steps for PEOF.</i>” • “<i>Determine an approach and allocate resourcing to address cross-government issues relevant to PEOF.</i>” • “<i>Review and reform policies to enable flexible application.</i>” <p>Additionally, the following design and implementation actions were recommended:</p> <ul style="list-style-type: none"> • “<i>Refine, optimise and clarify governance structures that support PEOF.</i>” • “<i>Review capabilities and resources needed to deliver PEOF.</i>” • “<i>Review PEOF offset pricing.</i>” <p>Incorporation of these recommendations aims to improve the PEOF process and aid the implementation of effective offset projects.</p>
<p>Environmental offsets will be focussed on longer term strategic outcomes.</p>	<p>Strategic focus items of the fund relevant to longer term strategic outcomes include:</p> <ul style="list-style-type: none"> • Projects will maintain a strategic, landscape-scale focus, and • Projects will balance significant impacts identified in state and Commonwealth approvals, reducing duplication and allowing strategic project delivery. <p>The funds approach of combining money from offsets under the EP Act and EPBC Act to deliver larger and more strategic landscape-scale projects than would occur if individual offset projects were delivered independently, effectively manages the risk of offsets not succeeding when compared to smaller individual offset projects implemented by Proponents. The benefit of contributing to strategic landscape-scale projects also includes the opportunity to achieve net ecological gain due to a coordinated approach and the ability to achieve positive biodiversity outcomes on a large scale outside of the project’s IDF.</p>



12.4 Significant Residual Impacts

The significant residual impacts of the Proposal, with reference to the Pilbara Environmental Offsets Fund, include:

- Permanent clearing of 427.5 ha of ‘Good to Excellent’ condition vegetation, and
- Permanent clearing of 8.09 ha of habitat critical to the survival of the Northern Quoll.
- Permanent clearing of 122.13 ha of critical supporting habitat for the Northern Quoll.

Potentially significant residual impacts of the Proposal, with reference to the Pilbara Environmental Offsets Fund, include:

- Permanent clearing of 15.71 ha of habitat critical to the survival of the PLNB and Ghost Bat.
- Permanent clearing of 434.47 ha of supporting habitat for the Northern Quoll, PLNB and Ghost Bat.

12.5 Implementation

It is envisaged that the conditions of any approval for the Proposal under the EP Act will require Fortescue to contribute to the fund. An Impact Reconciliation Procedure will be developed for approval by the DWER CEO.

Impact Reconciliation Reports (IRR) will then be submitted biennially (from the time the Proposal is approved). The IRR will advise DWER on the amount of clearing that has been undertaken each year during the biennial reporting period. This clearing is then used to define the financial contribution to the fund for areas cleared during the reporting period, with the rate per hectare determined in accordance with the fund’s implementation plan. The calculations for the fund include a base rate for vegetation in Good to Excellent condition, and a higher rate for areas of specialised environmental values (Northern Quoll critical habitat and potentially PLNB and Ghost Bat critical habitat).

12.6 Offsets Fund Contribution

Based on the Pilbara Environmental Offsets Fund Implementation plan (DWER, 2019), it is expected that Fortescue will be required to pay a rate per hectare of impact to native vegetation in Good to Excellent condition, and for the critical habitat for the Northern Quoll. It has conservatively been assumed that an offset will be required for the potentially significant residual impact from clearing of PLNB and Ghost Bat critical habitat.

The base rate will apply for “impacts to native vegetation in Good to Excellent condition, which may include impacts to fauna habitat (including threatened fauna)”. It is noted that The Proposal is located within the Chichester subregion and the Fortescue subregion and therefore two rates will apply across these subregions.

However, it is expected that a higher rate will apply to the Proposal’s impact on critical habitat for Threatened fauna species (the Northern Quoll, PLNB and Ghost Bat) (DWER, 2019). There are some areas of Northern Quoll, PLNB and Ghost Bat critical habitat that overlap vegetation



in 'Good' to 'Excellent' condition. To avoid double offsetting, these overlapping areas will be offset at the higher rate, and the base rate will not be applied.

The estimated financial contribution is based on the 2024/2025 rates as published on the PEOF website (GoWA, 2024), and anticipated hectares to be **permanently cleared**. However, the financial contribution will be based on actual **permanent clearing**, and this can only be calculated after clearing has been conducted.

It is anticipated that the value of expenditure per hectare of clearing will be annually adjusted in accordance with the Perth All Groups Consumer Price Index (CPI) fluctuations from 1 July 2026. The Australian Bureau of Statistics (ABS) publish the annual CPI for Australian cities in September of each year and will be referenced when calculating the annual adjustments.

Table 12-3: Significant Residual Impacts Requiring an Offset*

IBRA Subregion	Environmental feature	Permanent clearing area (ha)	Contribution	Offset rate	Total
Chichester Subregion	Permanent clearing of habitat critical to the survival of the Northern Quoll, PLNB and Ghost Bat, and critical supporting habitat for the Northern Quoll.	137.84	Based on DWER (2019), it is expected that a higher rate per hectare of clearing should be contributed to the fund for the 137.84 ha of critical habitat and critical supporting habitat associated with these species.	\$1,920.00	\$264,652.80
	Permanent clearing of supporting habitat for the Northern Quoll, PLNB and Ghost Bat.	434.47	Based on DWER (2019), it is expected that the base rate per hectare of clearing should be contributed to the fund for the 434.47 ha of supporting habitat associated with these species.	\$960.00	\$417,091.20
	Permanent clearing of 'Good to Excellent' condition vegetation that does not overlap the Northern Quoll, PLNB and Ghost Bat critical in the above row.	412.62	Based on DWER (2019), it is expected that the base rate per hectare of clearing should be contributed to the fund for the 935.52 ha of vegetation in 'Good' to 'Excellent' condition.	\$960.00	\$396,115.20

*Note that these calculations have conservatively assumed that the potentially significant residual impact of clearing PLNB and Ghost Bat critical habitat requires offsetting.



13 CONCLUSION

PEG, a wholly owned subsidiary of Fortescue, is proposing to develop the Bonney Downs Wind Farm, comprising of wind generation for power supply.

The Proposal includes the installation of up to 100 wind turbines and six substations, with a total capacity of up to 2.1 GW. The Proposal involves disturbance of up to 944.07 ha within an 89,973.86 ha DE.

The Proposal has the potential to adversely impact the environmental and social values within the DE. These factors and any significant residual impacts are discussed below.

Flora and Vegetation

To protect flora and vegetation so that biological diversity and ecological integrity are maintained.

The Proposal will result in the clearing of 910.26 ha of native vegetation. The following significant residual impacts are expected after mitigation measures are applied:

- Permanent clearing of 427.5 ha of 'Good to Excellent' condition vegetation. An environmental offset is proposed for this residual impact.

Other potential impacts on flora and fauna are not significant at the local or regional scale. The avoidance and minimisation of impacts, as well as offsetting of the significant residual impact (see Chapter 7) will result in the biological diversity and ecological integrity of the study area being maintained. The Proposal is therefore consistent with the EPA's environmental objective for flora and vegetation.

Terrestrial Fauna

To protect terrestrial fauna so that biological diversity and ecological integrity are maintained.

The Proposal will result in the clearing of 910.26 ha of fauna habitat, some of which provides habitat for conservation significant fauna. Residual impacts to Northern Quoll habitat critical for the survival of the species are expected after mitigation measures are applied, as following:

- Permanent clearing of no more than 8.09 ha of rocky escarpments (ridges/mesa/cliff/outcrops/breakaways) in the northern portion of the DE.
- Permanent clearing of 122.13 ha of critical supporting habitat for the Northern Quoll.

Potentially significant residual impacts to PLNB and Ghost Bat habitat critical for the survival of the species are expected after mitigation measures are applied, as following:

- Permanent clearing of no more than 14.88 ha of rocky escarpments (ridges/mesa/cliff/outcrops/breakaways) in the DE, and
- Permanent clearing of no more than 0.83 ha of drainage Line/River/Creek (major) in the DE.

Other potential direct and indirect impacts to terrestrial fauna associated with the Proposal will not be significant at a local or regional scale. The avoidance and minimisation of impacts, as



well as offsetting of the significant residual impacts (see Chapter 12) will result in the biological diversity and ecological integrity of the study area being maintained. The Proposal is therefore consistent with the EPA's environmental objective for terrestrial fauna.

Social Surroundings

To protect the factors included in Social Surroundings from significant harm.

No impacts to nearby towns, surrounding industry, visual amenity, landscape or non-Aboriginal heritage are anticipated to occur as a result of the Proposal. Additionally, dust impacts from the Proposal are not expected to have a significant impact on Social Surroundings.

Potential impacts from noise are anticipated at Bonney Downs Homestead that will exceed target noise levels. Fortescue is committed to mitigating noise exceedances at the Bonney Downs Homestead through the implementation of appropriate mitigation measures to ensure noise levels remain within the prescribed thresholds during operation.

Fortescue is committed to minimising impacts on Heritage Places in all of its project areas which includes wherever possible avoidance of impacts on Heritage Places. Where the Proposal cannot avoid impact to Heritage Places or potential Heritage Places, Fortescue will consult with Palyku and Nyiyaparli and apply for relevant approvals under the AH Act. Fortescue will comply with the AH Act and any approval conditions set by the Minister of Aboriginal Affairs at all times during construction and operation of the Proposal. With respect to access to country, dust management on heritage places, culturally significant plants and animals, and water sources, Fortescue will continue to consult with Palyku and Nyiyaparli to ensure that impacts are minimised.

No significant residual impacts to social surroundings have been identified and the EPA's objective for the Social Surroundings factor 'to protect social surroundings from significant harm' can be met.

Other Factors

Through the implementation of standard mitigation measures and controlled through other consenting regimes (e.g. RIWI Act), no significant impacts are anticipated as a result of the Proposal with regard to inland waters, terrestrial environmental quality and landforms.



REFERENCES

Australian Bureau of Statistics (ABS), 2021. 2021 Census All persons Quickstats. Available at: <https://www.abs.gov.au/census/find-census-data/quickstats>. Accessed on: 12/03/2025

Australian New Zealand Guidelines (ANZG), 2018. Australian and New Zealand Guidelines for Fresh and Marine Water Quality. Australian and New Zealand Governments and Australian state and territory governments, Canberra, ACT, Australia. Available at: <https://www.waterquality.gov.au/issues/acid-sulfate-soils>. Accessed on: 17/12/2024.

Atlas of Living Australia (ALA), 2025. Spatial Portal. Available at: <https://spatial.ala.org.au/>

Band, W., M. Madders & D. P. Whitfield, 2007. Developing field and analytical methods to assess avian collision risk at wind farms. In: *Birds and Wind Farms: Risk Assessment and Mitigation*: 259-275. M. de Lucas, G. F. E. Janss & M. Ferrer (Eds.). Quercus, Madrid.

Bat Call, 2021. A review of ghost bat ecology, threats and survey requirements, report prepared for the Department of Agriculture, Water and the Environment, Canberra. CC BY-NC-ND 4.0

Barrett G, Silcocks A, Barry S, Cunningham R and Poulter R., 2003. *The new atlas of Australian birds*. Royal Australasian Ornithologists Union, Hawthorn East, Victoria.

Beard, J. S., 1975. *Map and Explanatory Notes to Sheet 5: The Vegetation of the Pilbara Area*. Nedlands, Western Australia: University of Western Australia Press.

Beard, J. S., 1990. *Plant Life of Western Australia*. Kenthurst: Kangaroo Press.

Beard, J. S., Beeston, G.R., Harvey, J.M., Hopkins, A. J. M. and Shepherd, D. P. 2013. *The vegetation of Western Australia at the 1:3,000,000 scale. Explanatory memoir. Second edition. Conservation Science Western Australia 9*: 1-152.

Birdlife Australia, 2010. Caspian Tern *Hydroprogne caspia*. [Online] Viewed 25 March 2021. Available from: <https://www.birdlife.org.au/bird-profile/caspian-tern>.

BirdLife Australia, 2017. Peregrine Falcon – Bird profile. Available at: <https://birdlife.org.au/bird-profiles/peregrine-falcon/>. Accessed on 18/02/2025.

Birdlife Australia, 2021. Common greenshank *Tringa nebularia*. [Online] Viewed 25 March 2021. Available from: <https://www.birdlife.org.au/bird-profile/common-greenshank>.

BirdLife Australia, 2023. Peregrine Falcon. Marchant, S. *et al* (eds) 1990-2006 *Handbook of Australian, New Zealand and Antarctic Birds*. Volume 1 to 7. Birdlife Australia. Birdlife Australia. Available at: <https://hazab.birdlife.org.au/species/peregrine-falcon/> Accessed on 18/02/2025.

Birdlife Australia, 2024. Peregrine Falcon (*Falco Peregrinus*). Available at: <https://birdlife.org.au/bird-profiles/peregrine-falcon>: Accessed on: 05/07/2024.

BirdLife Australia, 2025. Birddata; Australian Database of Birds. <https://birddata.birdlife.org.au/about-birddata>.



Bird Life International, 2007. BirdLife. Retrieved February 21, 2022, from https://migratorysoaringbirds.birdlife.org/sites/default/files/BHDTF__Position_Power_Lines_and_birds_2007_05_10_.pdf.

BirdLife International, 2018. Species factsheet: Caspian Tern *Hydroprogne caspia*. Downloaded from <https://datazone.birdlife.org/species/factsheet/caspian-tern-hydroprogne-caspia> on 24/02/2025

BirdLife International, 2019. Species factsheet: Common Gull-billed Tern *Gelochelidon nilotica*. Downloaded from <https://datazone.birdlife.org/species/factsheet/common-gull-billed-tern-gelochelidon-nilotica> on 26/02/2025

Bishop, K.D., 2006. Shorebirds in New Guinea: their status, conservation and distribution. *Stilt*. 50:103-134.

Blakers M, Davies S J J F and Reilly PN., 1984. The atlas of Australian birds. Royal Australasian Ornithologists Union. Melbourne University Press, Victoria.

Braithwaite, R.W., and Griffiths, A., 1994. Demographic variation and range contraction in the northern quoll *Dasyurus hallucatus* (Marsupialia: Dasyuridae). *Wildlife Research* 21:203-17.

Bryant C., 2008. Understanding bushfire: trends in deliberate vegetation fires in Australia. Australian Institute of Criminology, Technical and background paper series No. 27 (Canberra, ACT).

Burbidge, AA, McKenzie, NL & Fuller, P.J., 2008. "Long-tailed Dunnart, *Sminthopsis longicaudata*" in *Mammals of Australia*, eds. S Van Dyck & R Strahan, Reed New Holland, Sydney, pp.148–150.

Bureau of Meteorology (BoM), 2024. Climate Statistics for Australian locations: summary statistics Marble Bar. Accessed on 16/12/2024. Available from: http://www.bom.gov.au/climate/averages/tables/cw_004106.shtml.

BoM (2025). Fire weather across Northern Australia. Available at: <https://media.bom.gov.au/social/blog/2171/fire-weather-across-northern-australia/#:~:text=Anyone%20who%20has%20visited%20northern,bushfires%20begin%20to%20appear>.

Carwardine, Josie, Nicol, Sam, Van Leeuwen, Stephen, Walters, Belinda, Firn, Jennifer, Reeson, Andrew, Martin, Tara, & Chades, Iadine, 2014. *Priority threat management for Pilbara species of conservation significance*. CSIRO Ecosystem Sciences, Australia.

Churchill, 1998. *Australian Bats*. Sydney: Reed New Holland.

Churchill S.K. 2009. *Australian bats- Second Edition*. Sydney: Allen & Unwin.

Cogger, H 2000. *Reptiles and Amphibians of Australia - 6th edition*, Reed New Holland, Sydney.

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



Crane, M., I. Silva, M. J. Grainger & G. A. Gale, 2022. Limitations and gaps in global bat wing morphology trait data. *Mammal Review*, 52, 165.

del Hoyo, J., A. Elliott, D.A. Christie & J. Sargatal, 1996. *Handbook of the Birds of the World: Hoatzin to Auks*. Barcelona: Lynx Edicions.

Department of Aboriginal Affairs and Department of the Premier and Cabinet (DAA & DPC), 2013. *Aboriginal Heritage Due Diligence Guidelines*. Version 3.0. 20 April 2013.

Department of Conservation and Land Management, 1994. *Reading the Remote: Landscape Characters of Western Australia*, Department of Conservation and Land Management, Como, Western Australia.

Department of Climate Change, Energy, the Environment and Water, 2024. *Conservation Advice for Tringa nebularia (common greenshank)*. Canberra: Department of Climate Change, Energy, the Environment and Water. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/832-conservation-advice-05012024.pdf>. In effect under the EPBC Act from 05-Jan-2024.

Department of the Environment, 2025. *Rostratula australis* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <https://www.environment.gov.au/sprat>

Department of the Environment, Water, Heritage and the Arts, 2008. *Approved Conservation Advice for Liasis olivaceus barroni (Olive Python - Pilbara subspecies)*. Canberra: Department of the Environment, Water, Heritage and the Arts. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/66699-conservation-advice.pdf>. In effect under the EPBC Act from 03-Jul-2008.

Department of Biodiversity, Conservation and Attractions (DBCA), 2017. *Guidelines for surveys to detect the presence of bilbies and assess the importance of habitat in Western Australia*. Version 1 – August 2017.

DBCA, 2017. *Guidelines for Surveys to Detect the Presence of Bilbies and Assess the Importance of Habitat in WA* (DBCA, 2017).

DBCA, 2018. *Directory of Important Wetlands in Australia - Western Australia (DBCA-045)*. Available at: <https://catalogue.data.wa.gov.au/dataset/directory-of-important-wetlands-in-western-australia>. Accessed on: 17/12/2024.

DBCA, 2019. *2018 Statewide Vegetation Statistics - Full report*. Available at: <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics/resource/0fc225fa-b06b-4da4-b5ed-62a146842389>.

DBCA, 2023a. *Priority Ecological Communities for Western Australia Version 35*. Species and Communities Program, Department of Biodiversity, Conservation and Attractions. 19 June 2023.

DBCA, 2023b. *Summary of knowledge for six faunal species that are Matters of National Environmental Significance in the Pilbara, Western Australia*.



DBCA, 2024a. DBCA - Legislated Lands and Waters (DBCA-011). Available at: <https://catalogue.data.wa.gov.au/dataset/dbca-legislated-lands-and-waters>. Accessed on: 17/12/2024.

DBCA, 2024b. DBCA - Lands of Interest (DBCA-012). Available at: <https://catalogue.data.wa.gov.au/dataset/dbca-lands-of-interest>. Accessed on: 17/12/2024.

DBCA, 2024c. DBCA Fire History (DBCA-060). Available at: <https://catalogue.data.wa.gov.au/dataset/dbca-fire-history>. Accessed on 25/02/2024.

DBCA, 2024d. Guidelines for determining the likely presence and habitat usage of night parrot (*Pezoporus occidentalis*) in Western Australia. Available at: <https://www.dbca.wa.gov.au/media/3783/download>.

DBCA, 2024e. Fortescue Marsh Nature Reserve (Niyiyaparli Country) draft joint management plan 2024. Parks and Wildlife Service, Department of Biodiversity, Conservation and Attractions, Perth, Western Australia.

DBCA, 2024f. Guidelines for determining the likely presence and habitat usage of night parrot (*Pezoporus occidentalis*) in Western Australia. Available at: <https://www.dbca.wa.gov.au/media/3783/download>.

Department of Agriculture, Water and the Environment, 2020. *Wildlife Conservation Plan for Seabirds*. Department of Agriculture, Water and the Environment, Canberra. Available from: <http://www.dcceew.gov.au/environment/biodiversity/publications/wildlife-conservation-plan-seabirds-2022>. In effect under the EPBC Act from 16-Jun-2022.

Department of Climate Change, Energy, the Environment and Water (DCCEEW), 2023a. Australia's bioregions (IBRA). Available at: <https://www.dcceew.gov.au/environment/land/nrs/science/ibra>. Accessed on 17/12/2024.

DCCEEW, 2023b. Recovery Plan for the Greater Bilby (*Macrotis lagotis*). Canberra: Department of Climate Change, Energy, the Environment and Water. Available from: <http://www.dcceew.gov.au/environment/biodiversity/threatened/publications/recovery/greater-bilby-2023>.

DCCEEW, 2023c. National Light Pollution Guidelines for Wildlife. Department of Climate Change, Energy, the Environment and Water, Canberra, May. CC BY 4.0.

DCCEEW, 2024a. *Conservation Advice for Calidris acuminata (sharp-tailed sandpiper)*. Canberra: Department of Climate Change, Energy, the Environment and Water. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/874-conservation-advice-05012024.pdf>. In effect under the EPBC Act from 05-Jan-2024.

DCCEEW, 2024. Onshore Wind Farm Guidance: Best practice approaches when seeking approval under Australia's national environmental law.

Department of Environment and Conservation (DEC), 2007. *Conserving Threatened Ecological Communities*. Publicly available brochure prepared by the Department of Environment and Conservation in conjunction with National Heritage Trust: Perth, WA

Department of Environmental Regulation (DER), 2014. A guide to the assessment of applications to clear native vegetation PAPER Under Part V Division 2 of the *Environmental Protection Act 1986*. December 2014.



DER, 2015a. Identification and investigation of acid sulfate soils and acidic landscapes. Version: Final. June 2015.

DER, 2015b. Treatment and management of soil and water in acid sulfate soil landscapes. Version: Final. June 2015.

Department of Mines, Industry, Regulation and Safety (DMIRS), 2018. 1:500 000 State interpreted bedrock geology (DMIRS-016). Available at: <https://catalogue.data.wa.gov.au/dataset/1-500-000-state-interpreted-bedrock-geology-dmirs-016>. Accessed on: 16/12/2024.

DMIRS, 2021. Safe storage of solid ammonium nitrate – code of practice (4th edition) reissued: Department of Mines, Industry Regulation and Safety, Western Australia, 35 pp.

DMIRS, 2024. Operating Mines (MINDEX). Available at: <https://catalogue.data.wa.gov.au/dataset/operating-mines>. Accessed on: 27/02/2025.

Department of Primary Industries and Regional Development (DPIRD), 2019. Data WA - Pre-European Vegetation (DPIRD-006). Available from: <https://catalogue.data.wa.gov.au/dataset/pre-european-dpird-006>. Accessed on: 16/12/2024.

DPIRD, 2022. Soil Landscape Mapping - Best Available (DPIRD-027). Available at: <https://catalogue.data.wa.gov.au/dataset/soil-landscape-mapping-best-available>. Accessed on: 16/12/2024.

DPIRD, 2023. Rangeland inventory and condition survey of the Pilbara region, Western Australia. Available from: <https://www.agric.wa.gov.au/rangelands/rangeland-inventory-and-condition-survey-pilbara-region-western-australia#:~:text=Pastoralism%20was%20the%20most%20extensive,ironstone%20ranges%20and%20greenstone%20belts>. Accessed on 18/12/2024.

Department of Planning, Lands and Heritage (DPLH), 2024. Aboriginal Cultural Heritage Inquiry System. Accessed on 05/03/2025

Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC), 2011a. Survey guidelines for Australia's threatened mammals. Guidelines for detecting mammals listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*.

DSEWPaC, 2011b. Survey guidelines for Australia's threatened reptiles. Guidelines for detecting reptiles listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*.

Department of Sustainability, Environment, Water, Population and Communities, 2013. *Approved Conservation Advice for Rostratula australis (Australian painted snipe)*. Canberra: Department of Sustainability, Environment, Water, Population and Communities. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/77037-conservation-advice.pdf>. In effect under the EPBC Act from 15-May-2013.

Department of the Environment, 2015. Wildlife Conservation Plan for Migratory Shorebirds. Canberra, ACT: Department of the Environment. Available from: <http://www.environment.gov.au/biodiversity/publications/wildlife-conservation-plan-migratory-shorebirds-2016>. In effect under the EPBC Act from 15-Jan-2016.



Department of the Environment (DoE), 2016. EPBC Act referral guideline for the endangered northern quoll, Commonwealth of Australia 2016.

Department of the Environment, Water, Heritage and the Arts (DEWHA), 2010a. Survey guidelines for Australia's threatened birds. Guidelines for detecting birds listed as threatened under the *Environment Protection and Biodiversity Conservation Act 1999*.

DEWHA, 2010b. Survey guidelines for Australia's threatened bats: Guidelines for detecting bats listed as threatened under the EPBC Act.

Department of Water (DoW), 2009. Rehabilitation of disturbed land in public drinking water source areas. Water Quality protection note 84. May 2009.

DoW, 2013. Mechanical servicing and workshops. Water quality protection note 28. September 2013.

DoW, 2015. Toxic and hazardous substances. Water Quality protection note 65. April 2015.

DoE, 2025a. *Apus pacificus* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <https://www.environment.gov.au/sprat>.

DoE, 2025b. *Charadrius veredus* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <https://www.environment.gov.au/sprat>.

Department of the Environment, 2025c. *Hydroprogne caspia* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <https://www.environment.gov.au/sprat>. Accessed Mon, 24 Feb 2025

Department of the Environment, 2025d. *Actitis hypoleucos* in Species Profile and Threats Database, Department of the Environment, Canberra. Available from: <https://www.environment.gov.au/sprat>. Accessed Thu, 27 Feb 2025

DoW, 2016. Groundwater assessment of north-west Hamersley range. Report No. HG62.

Department of Water and Environmental Regulation (DWER), 2018a. RIWI Act, Surface Water Areas and Irrigation Districts (DWER-037). Available at: <https://catalogue.data.wa.gov.au/dataset/riwi-act-surface-water-areas-and-irrigation-districts>. Accessed on: 17/12/2024.

DWER, 2018b. RIWI Act, Groundwater Areas (DWER-034). Available at: <https://catalogue.data.wa.gov.au/dataset/riwi-act-groundwater-areas#:~:text=Groundwater%20areas%20proclaimed%20under%20the,are%20managed%20within%20groundwater%20areas>. Accessed on: 17/12/2024.

DWER, 2018c. Hydrographic Catchments - Basins (DWER-027). Available at: <https://catalogue.data.wa.gov.au/dataset/hydrographic-catchments-basins>. Accessed on: 17/12/2024.

DWER, 2018d. Nationally Important Wetlands.

DWER, 2018c. RIWI Act, Rivers (DWER-036). Available at: <https://catalogue.data.wa.gov.au/dataset/riwi-act-rivers>. Accessed on: 17/12/2024.

DWER, 2019. Pilbara Environmental Offsets Fund Implementation Plan. November 2019.



DWER, 2021a. Land use compatibility tables for public drinking water source areas. Water Quality protection note 25. August 2021.

DWER, 2021b. Clearing Regulations - Environmentally Sensitive Areas (DWER-046). Available at: <https://catalogue.data.wa.gov.au/dataset/clearing-regulations-environmentally-sensitive-areas-dwer-046>. Accessed on: 17/12/2024.

DWER, 2021c. Assessment and management of contaminated sites Activities regulated under the: Contaminated Sites Act 2003, Contaminated Sites Regulations 2006, National Environment Protection (Assessment of Site Contamination) Measure 1999.

DWER, 2021d. Climate projections for Western Australia. Accessed online. Last updated: Thursday, 15 April 2021. Available at: <https://www.agric.wa.gov.au/climate-change/climate-projections-western-australia>.

DWER, 2021e. Draft Guideline: Dust Emissions. July 2021.

DWER, 2024a. Public Drinking Water Source Areas (DWER-033). Available at: <https://catalogue.data.wa.gov.au/dataset/public-drinking-water-source-areas>. Accessed on: 17/12/2024.

DWER, 2024b. Hydrographic Catchments - Catchments (DWER-028). Available at: <https://catalogue.data.wa.gov.au/dataset/hydrographic-catchments-catchments#:~:text=This%20dataset%20is%20the%20Western,Catchments%20and%20Basins%20to%20Divisions>. Accessed on: 17/12/2024.

DWER, 2024c. Contaminated Sites Database (DWER-059). Available at: <https://catalogue.data.wa.gov.au/dataset/contaminated-reported-sites-dwer-059>. Accessed on: 17/12/2024.

Department for Planning and Infrastructure, 2007. Visual Landscape Planning in Western Australia: a manual for evaluation, assessment, siting and design.

Dwyer, J. F., Pandey, A. K., McHale, L. A., & Harness, R. E., 2020. Near-ultraviolet light reduced Sandhill Crane collisions with a power line by 98%. *The Condor*, 1-10.

Ecologia Environment (Ecologia), 2024. Bonney Downs North: Terrestrial Vertebrate Fauna Assessment.

Ecologia Environment (ecologia), 2025a. Bonney Downs Consolidated Flora and Vegetation Assessment. Prepared for Fortescue Ltd.

Ecologia Environment (ecologia), 2025b. Fortescue Metals Group Limited Bonney Downs: Terrestrial Vertebrate Fauna Survey Consolidation.

Ecologia Environment (ecologia), 2026. Fortescue Limited Bonney Downs Wind Farm Bat and Bird Site Utilisation Report – year 2.

EPA, 2008. Environmental Guidance for Planning and Development. Guidance Statement No. 33. EPA, May 2008.

EPA, 2009. Wind Farms Environmental Noise Guidelines. South Australia EPA.



EPA, 2014. Cumulative environmental impacts of development in the Pilbara region. Advice of the Environmental Protection Authority to the Minister for Environment under Section 16(e) of the *Environmental Protection Act 1986*. August 2014.

EPA, 2016a. Technical Guidance Flora and Vegetation Surveys for Environmental Impact Assessment. Environmental Protection Authority, December 2016.

EPA, 2016b. Environmental Factor Guideline: Flora and Vegetation, EPA, Western Australia.

EPA, 2016c. Environmental Factor Guideline: Terrestrial Fauna, EPA, Western Australia.

EPA, 2016d. Technical Guidance Sampling of short range endemic invertebrate fauna. Environmental Protection Authority, December 2016.

EPA, 2016e. Environmental Factor Guideline: Terrestrial Environmental Quality, EPA, Western Australia.

EPA, 2018a. Environmental Factor Guideline: Inland Waters, EPA, Western Australia.

EPA, 2018b. Environmental Factor Guideline: Landforms, EPA, Western Australia.

EPA, 2020. Technical Guidance Terrestrial vertebrate fauna surveys for environmental impact assessment. Environmental Protection Authority. June 2020.

EPA, 2023a. Statement of environmental principles, factors, objectives and aims of EIA. Environmental Protection Authority, April 2023.

EPA, 2023b. Environmental Factor Guideline: Social Surroundings, EPA, Western Australia.

EPA, 2023c. Technical Guidance Environmental impact assessment of Social Surroundings Aboriginal cultural heritage, EPA, Western Australia.

EPA, 2023d. Environmental Factor Guidelines: Greenhouse Gas Emissions. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/Guideline-GHG-Emissions%20-%20April%202023.pdf

EPA, 2024a. Instructions: How to prepare an environmental review document. Accessed on 09/04/2024. Available from: https://www.epa.wa.gov.au/sites/default/files/Forms_and_Templates/Instructions-%20How%20to%20prepare%20an%20Environmental%20Review%20Document_0.pdf.

EPA, 2024b, Environmental Impact Assessment (Part IV Divisions 1 and 2) Administrative Procedures 2024 (Government Gazette No. 153)

Falster, Gallagher et al, 2021. AusTraits, a curated plant trait database for the Australian flora. Scientific Data 8: 254. <https://doi.org/10.1038/s41597-021-01006-6>

Fitzpatrick, Rob; Powell, Bernie; & Marvanek, Steve., 2011. Atlas of Australian Acid Sulphate Soils. v2. CSIRO. Data Collection. <https://doi.org/10.4225/08/512E79A0BC589>.

Fortescue, 2021. Nullagine Baseline and Groundwater Change Assessment – Nullagine Iron Ore Project. Ref: CH-16018-RP-HY-0001. September 2021.



Fortescue, 2022. Bonney Downs Desktop Groundwater Assessment – Water Resources Engineering. REF: AUSS0003-0000-CI-MEM-0003. January 2022.

Fortescue, 2025. Bonney Downs to Christmas Creek Transmission Corridor (PTP Stage 8) – Baseline Hydrology and Qualitative Impact Assessment. Pilbara Decarbonisation Wind Generation Project.

Fortescue, 2024. Bonney Downs – Post Development Hydrology Study. Pilbara Decarbonisation Wind Generation Project.

Gallagher, R.V., Allen, S., Mackenzie, B.D., Yates, C.J., Gosper, C.R., Keith, D.A., Merow, C., White, M.D., Wenk, E., Maitner, B.S. and He, K., 2021. High fire frequency and the impact of the 2019–2020 megafires on Australian plant diversity. *Diversity and Distributions*, 27(7), pp.1166-1179.

Geering, A., L. Agnew & S. Harding, eds, 2007. *Shorebirds of Australia*. Melbourne: CSIRO Publishing.

Geoscience Australia, 2010. SRTM-derived 1 Second Digital Elevation Model (DEM-S) Version 1.0. Geoscience Australia, Canberra. Available: Product catalogue - Geoscience Australia (ga.gov.au).

GHD, 2025. Bonney Downs Wind Farm – Dust Assessment. Prepared for Fortescue.

Gibson N Coates DA Thiele KR, 2007. Taxonomic research and the conservation status of flora in the Yilgarn Banded Iron Formation ranges, *Nuytsia* 17, 1–12.

Government of Western Australia (GoWA), 2011. WA Environmental Offsets Policy. Available from:

https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/WAEnvOffsetsPolicy-270911.pdf

GoWA, 2014. WA Environmental Offsets Guidelines. Available from: https://www.epa.wa.gov.au/sites/default/files/Policies_and_Guidance/WA%20Environmental%20Offsets%20Guideline%20August%202014.pdf

Government of WA, 2017. Bonney Downs Homestead and Log Cabin. Available at: <https://inherit.dplh.wa.gov.au/public/inventory/details/ac4b77ba-3957-4680-b544-866b7417203f>. Accessed on: 07/03/2025

GoWA, 2019. 2018 Statewide Vegetation Statistics - Full report. Available from: <https://catalogue.data.wa.gov.au/dataset/dbca-statewide-vegetation-statistics/resource/0fc225fa-b06b-4da4-b5ed-62a146842389>

GoWA, 2023. Pilbara Conservation Strategy. Available from: <https://www.dbca.wa.gov.au/management/pilbara>.

GoWA, 2024. Program: Pilbara Environmental Offsets Fund. Accessed on 09/01/2025. Available at: <https://www.wa.gov.au/service/environment/business-and-community-assistance/program-pilbara-environmental-offsets-fund>.



Government of Western Australia, 2025. Newman Air Quality. Available at: <https://www.wa.gov.au/service/environment/environment-information-services/newman-air-quality>. Accessed on 07/03/2025

Halpern Glick Maunsell, Biota, and M.E. Trudgen & Associates, 2001. Austeel Biological Survey, Phase I. Unpublished report ES974691A100 prepared for Austeel Pty Ltd, February 2001, Halpern Glick Maunsell with Biota Environmental Sciences and M.E. Trudgen & Associates, Western Australia.

Hancock, J.A., J.A. Kushlan & M.P. Kahl, 1992. Storks, Ibises and Spoonbills of the world. London, Academic Press.

Hamersley Iron, 2023. The Pebble-mound mouse (*Pseudomys chapmani*). Available at: <https://library.dbca.wa.gov.au/static/FullTextFiles/150217.pdf>.

[Harry Butler Institute \(HBI\), 2026a. Bird and Bat Management Plan science for wind energy developments. Project 2.2.3 Collision Risk Modelling Outcomes Final Report. Murdoch University.](#)

[Harry Butler Institute \(HBI\), 2026b. Bird and Bat Management Plan science for wind energy developments. Project 2.1.3 Literature review and bat traits analysis. Murdoch University.](#)

Harvey Mark S., Rix Michael G., Framenau Volker W., Hamilton Zoë R., Johnson Michael S., Teale Roy J., Humphreys Garth, Humphreys William F., 2011. Protecting the innocent: studying short-range endemic taxa enhances conservation outcomes. *Invertebrate Systematics* **25**, 1-10.

Hayman, P., J. Marchant & T. Prater, 1986. *Shorebirds. An identification guide to the waders of the world*. London & Sydney: Croom Helm.

Hydrobiology, 2014. Bonnie Pool Source Analysis- Memorandum, Prepared for Worley Parsons. East Perth.

Judith L. Fisher, William A. Loneragan, Kingsley Dixon, Julie Delaney, Erik J. Veneklaas, 2009. Altered vegetation structure and composition linked to fire frequency and plant invasion in a biodiverse woodland, *Biological Conservation*, Volume 142, Issue 10.

Hernandez-Santin, L., Goldizen, A. W., & Fisher, D. O., 2016. Introduced predators and habitat structure influence range contraction of an endangered native predator, the northern quoll. *Biological Conservation*, 203, 160-167.

Higgins, P.J. & Davies, S.J.J.F., 1996. Handbook of Australian, New Zealand and Antarctic Birds, Volume 3, Snipe to Pigeons, Oxford University Press, Melbourne.

Hammer, T.A., Davis, R.W. and Thiele, K.R., 2020. Clarification of species boundaries within the *Ptilotus royceanus* Benl (Amaranthaceae) group. *Austrobaileya*, 10(4), pp.628-638.

Higgins, PJ (Ed.), 1999. Handbook of Australian, New Zealand and Antarctic Birds. Volume 4: Parrots to Dollarbird. Oxford University Press, Melbourne.

Hill, B.M. & S.J. Ward, 2010. National Recovery Plan For the Northern Quoll *Dasyurus hallucatus*. Department of Natural Resources, Environment, The Arts and Sport, Darwin. Available from: <http://www.environment.gov.au/resource/national-recovery-plan-northern-quoll-dasyurus-hallucatus>. In effect under the EPBC Act from 16-Dec-2010.

Isbell, R.F., 1996. The Australian soil classification system. CSIRO, Publishing, Melbourne.



- Johnson, K. A., 2008. Bilby, *Macrotis lagotis*. In S. van Dyck & R. Strahan (Eds.), *The Mammals of Australia* (pp. 191-193). Sydney: Reed New Holland.
- Johnstone, R. E. E., & Storr, G. M. 1998. Handbook of Western Australian Birds, Volume 1 – Non-Passerines (Emu to Dollarbird). Perth: Western Australian Museum.
- Karla Nyiyaparli Aboriginal Corporation (KNAC), 2022. Nyiyaparli People & Country Plan Fortescue Marsh 2023-2032.
- Kendrick P, 2001. Pilbara 2 (PIL2 – Fortescue Plains subregion). 'Biodivers. Audit West. Aust. 53 Biogeographic Subregions 2002. pp. 559-567. Department of Conservation and Land Management.
- Kendrik P, McKenzie N., 2001. Pilbara 1 (PIL1 – Chichester subregion). 'Biodivers. Audit West. Aust. 53 Biogeographic Subregions 2002. pp. 466-479. Department of Conservation and Land Management.
- Landloch, 2025. Bonney Downs Wind Generation Hub: Desktop Soil and Landform Assessment. Fortescue Limited. August 2025.
- Martin, DMcB, 2021. Hamersley Group, lower (AP_-HAL-xkt-ci): Geological Survey of Western Australia, WA Geology Online, Explanatory Notes extract, viewed 03 April 2025. www.dmp.wa.gov.au/ens
- Marchant, S. & P.J. Higgins, eds., 1993. Handbook of Australian, New Zealand and Antarctic Birds. Volume 2 - Raptors to Lapwings. Melbourne, Victoria: Oxford University Press.
- Melville, D.S., 1997. Threats to waders along the East Asian-Australasian Flyway. In: Straw, P., ed. Shorebird conservation in the Asia-Pacific region. Page(s) 15-34. Melbourne, Victoria: Birds Australia.
- McKenzie N, May JE, McKenna S (Eds), 2003. Bioregional Summary of the 2002 Biodiversity Audit for Western Australia. Department of Conservation and Land Management, Western Australia.
- Molina, K. C., J. F. Parnell and Erwin, R. M. 2014. Gull-billed Tern (*Gelochelidon nilotica*). In: P. G. Rodewald (ed.), *The Birds of North America*, Cornell Lab of Ornithology, Ithaca, NY.
- Moloney, P. D., Lumsden, L. F., & Smales, I., 2019. Investigation of existing post-construction mortality monitoring at Victorian wind farms to assess its utility in estimating mortality rates. Arthur Rylah Institute for Environmental Research Technical Report Series No. 302. Department of Environment. Land, Water and Planning, Melbourne, Vic., Australia.
- Molyneux, J., Pavey, C. R., James, A. I., & Carthew, S. M., 2018. Habitat use by the brush-tailed mulgara (*Dasyercus blythi*). *Australian Journal of Zoology*, 65(5), 335-345.
- Moreno-de las Heras, M., Saco, P.M., Willgoose, G.R. and Tongway, D.J., 2012. Variations in hydrological connectivity of Australian semiarid landscapes indicate abrupt changes in rainfall-use efficiency of vegetation. *Journal of Geophysical Research: Biogeosciences*, 117(G3).
- Moore, H. A., Dunlop, J. A., Jolly, C. J., Kelly, E., Woinarski, J. C., Ritchie, E. G., & Nimmo, D. G., 2021. A brief history of the northern quoll (*Dasyurus hallucatus*): a systematic review. *Australian Mammalogy*, 44(2), 185-207.



Moro, D., & Kutt, A. S., 2008. Northern Short-tailed Mouse, *Leggadina lakedownensis*. In S. van Dyck & R. Strahan (Eds.), *The Mammals of Australia* (pp. 583-584). Sydney: Reed New Holland.

Mullin, D.W., McCulloch, G.A., Schoenjahn, J., Walter, G.H. 2020. Phylogeography of the rare Australian endemic Grey Falcon *Falco hypoleucos*: implications for conservation. *Bird Conservation International* 30: 447-455.

MWH, 2010. BC Iron Nullagine Water Supply Project. Unpublished consultancy report prepared for BC Iron Limited. Ref: A1210200 Rev 3. April 2010.

National Environmental Science Program (NESP) Threatened Species Recovery Hub, 2021. Arid Zone Monitoring Species Profile: Brush-tailed mulgara, Project 3.2.5 findings factsheet.

NatureScot. 2025. Guidance on using an updated collision risk model to assess bird collision risk at onshore wind farms. NatureScot, Scotland;s Nature Agency.
<https://www.nature.scot/doc/guidance-using-updated-collision-risk-model-assess-bird-collision-risk-onshore-wind-farms>

Newman-Martin, J., Travouillon, K. J., Warburton, N., Barham, M., & Blyth, A. J., 2023. Taxonomic review of the genus *Dasycercus* (Dasyuromorphia: Dasyuridae) using modern and subfossil material; and the description of three new species. *Alcheringa: An Australasian Journal of Palaeontology*, 47(4), 624-661.

Night Parrot Recovery Team, 2016. Personal communication, 31 March 2016.

Norberg, U. M. & M. B. Fenton, 1988. Carnivorous bats? *Biological Journal of the Linnean Society*, 33, 383.

NT Government, 2021. Department of Environment, Parks and Water Security. Threatened species of the Northern Territory – Grey falcon *Falco hypoleucos*. November 2021.

Pavey, C, 2006. Threatened Species of the Northern Territory: Greater Bilby *Macrotis lagotis*. Parks and Wildlife Commission - Northern Territory Government.

Pavey Chris R., Nano Catherine E. M., Cooper Steven J. B., Cole Jeff R., McDonald Peter J., 2012. Habitat use, population dynamics and species identification of mulgara, *Dasycercus blythi* and *D. cristicauda*, in a zone of sympatry in central Australia. *Australian Journal of Zoology* 59, 156-169.

Pearson, DJ, 1993. 'Distribution, status and conservation of pythons in Western Australia', In: Lunney, D & Ayers, D (Eds) *Herpetology in Australia: a Diverse Discipline*, pp. 383-395, Royal Zoological Society of NSW, Sydney.

Pearson, DJ, 2006. 'Giant Pythons of the Pilbara', *Landscape*, vol. 19, pp. 32-39.

Peng, L., Wan, Y.B., Li, H., Du, M.D. and Shi, Q.D., 2024. Influence of surface water and groundwater gradient on spatial distribution of typical vegetation in the hinterland of Taklamakan desert. *Science of The Total Environment*, 953, p.176060.

Pilbara Development Commission, 2024. The Region. Regional profile on Pilbara Development Commission Website. Available at:
<https://app.remplan.com.au/pilbararegion/economy/summary?state=WZPpFw0lPI7owpXCnE1dORtYh2hplq>. Accessed on: 7 January 2025.



Reid, K. & G. B. Baker, 2025. Impacts on birds and bats from onshore wind farms in Australia. An ecological risk assessment. Ross Analytics Pty Ltd and Latitude 42 Environmental Consultants Pty Ltd. Report prepared for the Department of Climate Change, Energy, the Environment and Water. CC BY 4.0, Canberra, ACT.

Rogers D, Hnace I, Paton S, Tzaros C, Griffioen P, Herring M, Jaensch R, Oring L, Silcocks A and Weston M, 2005. The breeding bottleneck: Breeding habitat and population decline in the Australian painted snipe. Status and Conservation of Shorebirds in the East Asian-Australasian Flyway. Proceedings of the Australasian Shorebirds Conference, 13–15 December 2003, Canberra, Australia.

Schoenjahn, J., 2013. A hot environment and one type of prey: investigating why the Grey Falcon (*Falco hypoleucos*) is Australia's rarest falcon. *Emu* 113: 19–25.

Schoenjahn, J., Pavey, C. R., & Walter, G. H., 2022. Has the Australian Endemic Grey Falcon the Most Extreme Dietary Specialization among all *Falco* Species?. *Animals* : an open access journal from MDPI, 12(12), 1582. <https://doi.org/10.3390/ani12121582>

Semeniuk V, Brocx M., 2019. The Archaean to Proterozoic igneous rocks of the Pilbara region, Western Australia – internationally significant geology of a globally unique potential geopark. *International Journal of Geoheritage and Parks* 7, pg. 56-71.

Shire of East Pilbara, 2022. Annual Report 2020/2021. Available from: <https://www.eastpilbara.wa.gov.au/documents/731/annual-report-2020-2021>. Accessed on 18/12/2024.

Skrzypek G., Dogramaci S. & Grierson P.F., 2013. Geochemical and hydrological processes controlling groundwater salinity of a large inland wetland of northwest Australia.

SLR, 2024. Detailed Flora and Vegetation Survey – Bonney Down East. Prepared for Fortescue. Revision 2.0, November 2024.

SLR, 2024b. Visual Impact Assessment – Bonney Downs Wind Generation Hub. Prepared for Fortescue.

Smales, I., 2014. Fauna Collisions with Wind Turbines: Effects and Impacts, Individuals and Populations. What Are We Trying to Assess? In (pp. 23-40). Dordrecht: Springer Netherlands.

Specialised Zoological, 2024. Identification of bat species from Bonney Downs, Western Australia. Prepared for Ecologia Environment Pty Ltd. Version 22 August 2024. SZ project reference SZ720.

Specialised Zoological, 2025. Identification of bat species from Bonney Downs, Western Australia. October 2023 – August 2025. Prepared for Ecologia Environment Pty Ltd. Version 1 December 2025. SZ project reference SZ761.

Spectrum Ecology, 2024. Bonney Downs South: Terrestrial Vertebrate Fauna Assessment.

State of Western Australia, 2005. Environmental Protection (Environmentally Sensitive Areas) Notice 2005.

Stewart, D., A. Rogers & D.I. Rogers, 2007. Species description. In: Geering, A., L. Agnew & S. Harding, eds. *Shorebirds of Australia*. Page(s) 75-196. Melbourne: CSIRO Publishing.

Strategen, 2013. Nullagine Iron Ore Extension Project Section 38 Referral Supporting Document.



Swan, M 2007, Keeping and Breeding Australian Pythons, Mike Swan Herp Books, Lilydale.

State of Western Australia, 2018. Fortescue Marsh Management Strategy 2018-2024. Prepared for DBCA.

Symbolix, 2020. Post Construction bird and bat monitoring at wind farms in Victoria. Ver 1.0, Public report. 13th Wind Wildlife Research Meeting 2020. Available at: https://static1.squarespace.com/static/521edeb1e4b01d29835d1d62/t/5f936ebf0a0443568cce1425/1603497671188/Symbolix_PostConstructionVic_Aus_20201024.pdf

Talis, 2024a. Bonney Downs Wind Stage 2 – Project Noise Assessment. Prepared for Fortescue.

Talis, 2024b. Bonney Dows Stage 2 Windfarm Generation Project – Construction Vibration Addendum. Prepared for Fortescue.

Talis, 2025. Bonney Downs Fauna Noise Impact Study. Prepared for Fortescue.

Threatened Species Scientific Committee, 2005. *Commonwealth Listing Advice on Northern Quoll (Dasyurus hallucatus)*. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/dasyurus-hallucatus.html>. In effect under the EPBC Act from 13-Apr-2005.

Trainer, J., S. Reiffer & R. Bullen, 2025. GPS tracking of the Pilbara Ghost bat. In: Biodiversity Conference: 124. Perth, Western Australia.

TSSC, 2016a. Conservation Advice *Macroderma gigas* ghost bat. Canberra: Department of the Environment. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/174-conservation-advice-05052016.pdf>. In effect under the EPBC Act from 05-May-2016.

TSSC, 2016b. Conservation Advice *Macrotis lagotis* greater bilby. Canberra: Department of the Environment. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/282-conservation-advice-15072016.pdf>. In effect under the EPBC Act from 15-Jul-2016.

TSSC, 2016c. *Conservation Advice Rhinonicteris aurantia (Pilbara form) (Pilbara Leaf-nosed Bat)*. Canberra: Department of the Environment. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/82790-conservation-advice-10032016.pdf>. In effect under the EPBC Act from 10-Mar-2016.

TSSC, 2016d. *Conservation Advice Pezoporus occidentalis night parrot*. Canberra: Department of the Environment. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/59350-conservation-advice-15072016.pdf>. In effect under the EPBC Act from 15-Jul-2016.

TSSC, 2020. *Conservation Advice Falco hypoleucos Grey Falcon*. Canberra: Department of Agriculture, Water and the Environment. Available from: <http://www.environment.gov.au/biodiversity/threatened/species/pubs/929-conservation-advice-09072020.pdf>. In effect under the EPBC Act from 09-Jul-2020.

Threatened and Priority Flora database (TPFL), 2025. DBCA restricted database. Requested in February, 2025.

Van Dyck, S. and Strahan, R. (eds.), 2008. The Mammals of Australia. Third Edition. New Holland Publisher (Australia) Pty Ltd, Australia.



van Vreeswyk, A M, Leighton, K A, Payne, A L, and Hennig, P., 2004. An inventory and condition survey of the Pilbara region, Western Australia. Department of Agriculture, Western Australia, Perth. Technical Bulletin 92.

Voigt, C. C., et al., 2024. Toward solving the global green–green dilemma between wind energy production and bat conservation. *BioScience*, 74, 240.

WA Herbarium (WA Herb), 2025. DBCA restricted database. Requested in February 2025.

Western Australian Planning Commission (WAPC), 2003. State Planning Policy No 2 Environment and Natural Resources.

WAPC, 2004. Planning Bulletin 67 Guidelines for Wind Farm Development.

WAPC, 2007. Visual Landscape Planning in Western Australia: a manual for evaluation, assessment, siting and design. A manual for evaluation, assessment, siting and design.

Woinarski, J., Burbidge, A., & Harrison, P., 2012. The action plan for Australian mammals 2012. CSIRO Publishing.

World Bank Group, 2015. Environmental, health, and safety guidelines for wind energy.

Worley Parsons, 2014a. Bonnie Creek Baseline Monitoring Program 2012-2014 Results, Prepared for BC Iron Limited. Perth.

Worley Parsons, 2014b. Bonnie East Surface Water Options Assessment, Prepared for BC Iron Limited. Perth.



**APPENDIX A BONNEY DOWNS CONSOLIDATED FLORA AND
VEGETATION ASSESSMENT (ECOLOGIA, 2025A)**



APPENDIX B ENVIRONMENTAL MANAGEMENT PLAN



APPENDIX C FORTESCUE GROUND DISTURBANCE AND TOPSOIL MANAGEMENT PROCEDURE



APPENDIX D FORTESCUE REHABILITATION AND REVEGETATION MONITORING PROCEDURE



APPENDIX E FORTESCUE WEED MANAGEMENT PLAN



**APPENDIX F TERRESTRIAL VERTEBRATE FAUNA SURVEY
(ECOLOGIA, 2025B)**



**APPENDIX G SHORT-RANGE ENDEMIC TERRESTRIAL
INVERTEBRATE ASSESSMENT FOR THE BONNEY DOWNS
ENERGY GENERATING HUB (HARRY BUTLER INSTITUTE, 2024)**



APPENDIX H BIRD AND BAT SITE UTILISATION SURVEY (ECOLOGIA, 2026)



APPENDIX I BIRD AND BAT ADAPTIVE MANAGEMENT PLAN (FORTESCUE, 2026)



**APPENDIX J BIRD AND BAT MANAGEMENT PLAN SCIENCE
FOR WIND ENERGY DEVELOPMENTS – LITERATURE REVIEW
AND BAT TRAITS ANALYSIS (HBI, 2026)**



**APPENDIX K BIRD AND BAT MANAGEMENT PLAN SCIENCE
FOR WIND ENERGY DEVELOPMENTS – COLLISION RISK
MODELLING OUTCOMES (HBI 2026B)**



APPENDIX L REGISTERED AND LODGED ABORIGINAL HERITAGE PLACES WITHIN THE DEVELOPMENT ENVELOPE



Appendix M Culturally Significant Plants and Animals



APPENDIX N BONNEY DOWNS WIND FARM NOISE ASSESSMENT



APPENDIX O BONNEY DOWNS FAUNA NOISE IMPACT STUDY



APPENDIX P BONNEY DOWNS WIND GENERATION HUB VISUAL IMPACT ASSESSMENT



APPENDIX Q BONNEY DOWNS WIND FARM DUST ASSESSMENT



**APPENDIX R BONNEY DOWNS BASELINE HYDROLOGY STUDY
(ADVISIAN, 2023)**



**APPENDIX S BONNEY DOWNS – POST DEVELOPMENT
HYDROLOGY STUDY (WIND GENERATION PROJECT)
(FORTESCUE, 2024)**



**APPENDIX T BONNEY DOWNS WIND GENERATION HUB:
DESKTOP SOIL AND LANDFORM ASSESSMENT (LANDLOCH,
2025)**
