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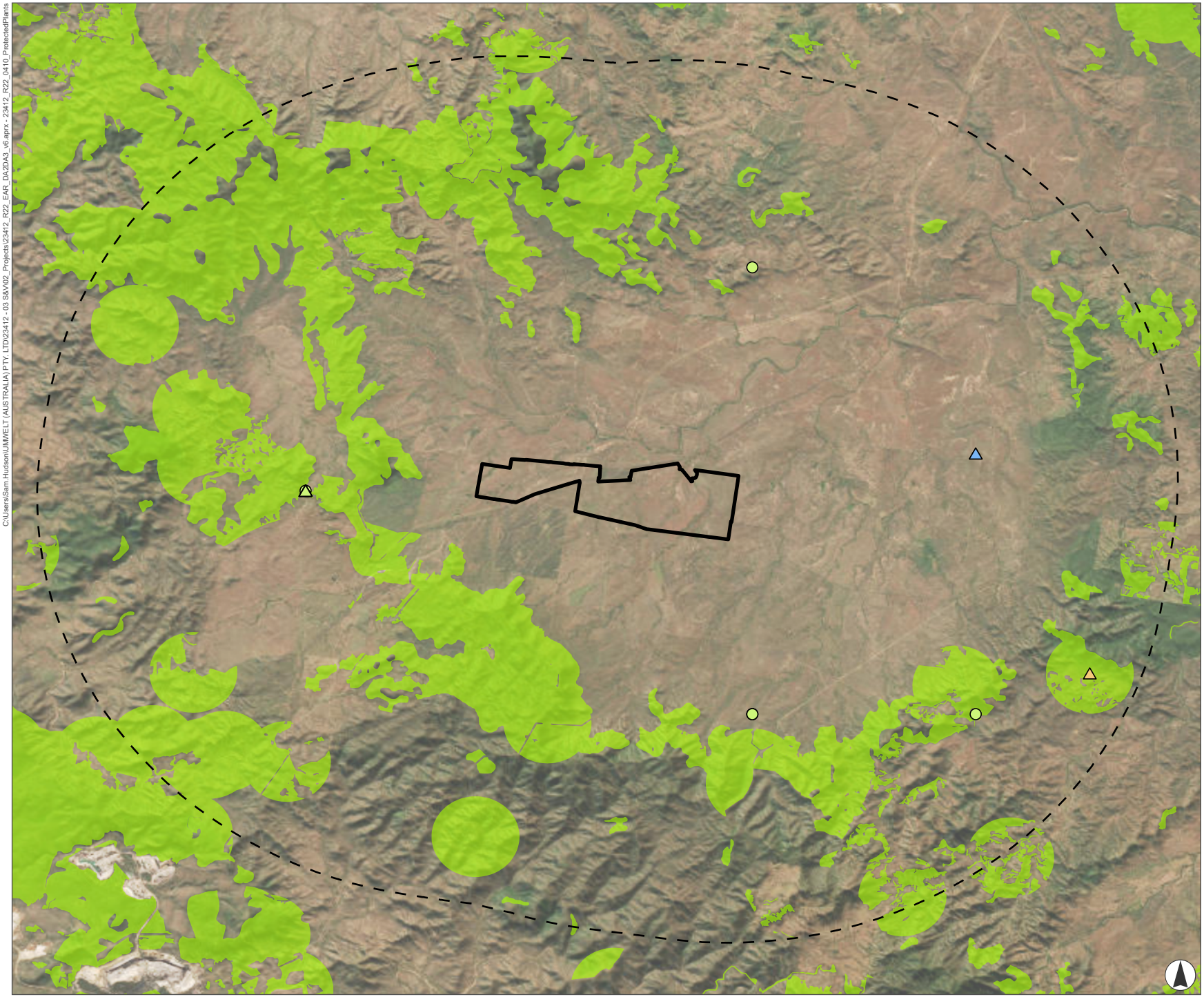


FIGURE 4.10

Threatened Flora Records and Protected Plants Trigger Mapping

Legend

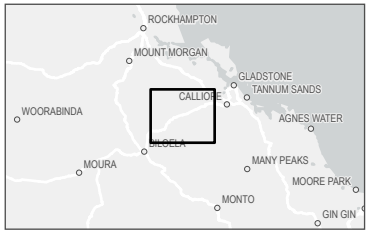
- Project Area
- 20km Project Area Buffer
- Protected Plants Trigger Mapping

Desktop Records (Wildnet)

- *Cycas megacarpa*

Desktop Records (ALA)

- *Acacia eremophiloides*
- *Cycas megacarpa*
- *Cyperus clarus*



0 2 4

Kilometres

Scale 1:260,000 at A4
GDA1994 Zone 56

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4.4 Fauna

4.4.1 Fauna Habitat Types

Fauna habitat within the Project Area has been subject to disturbances on both large and small scales from agricultural practices including clearing and thinning, exacerbation of weeds and pests, fragmentation and erosion and is of reduced quality across much of the Project Area. Ongoing disturbances have led to a high variability in the quality of habitat including watercourses and / or drainage features that lack a native understory, regrowth of juvenile canopy species, a decrease in microhabitat features such as woody debris and leaf litter, reduced structural complexity and the destruction/disturbance to wetland habitat by introduced pest species (i.e. feral pig [*Sus scrofa**] and cane toad [*Rhinella marina**]).

Some patches of valuable habitat remain in these areas. However, they are typically degraded and fragmented. The highest value fauna habitat is within the central extent of the Project Area and the riparian zones of watercourses. In these areas, patches of mature regrowth and remnant eucalypt woodlands are present with a range of microhabitat values in varying conditions, including native grassy groundcover, gullies and watercourses, some small to medium hollows, stags, arboreal termitaria (i.e. homes of arboreal termites) and leaf litter. This area also provides the greatest opportunity for fauna dispersal at a local and regional scale, as it is functionally connected for many taxa, to larger areas of remnant vegetation to the south and west.

The Project Area can be characterised into 7 habitat types based on the findings of the field survey program. The different habitat types support the ecological requirements for the diversity of fauna species occurring or potentially occurring within the Project Area. The presence and extent of these habitat types is summarised in **Table 4.7** and displayed in **Figure 4.11**. A detailed summary of each of the 7 identified habitat types are provided in **Section 4.4.1.1** to **Section 4.4.1.7**.

Table 4.7 Fauna Habitat Types within the Project Area and Vegetation Clearance Footprint

Fauna Habitat Type	Associated REs	Extent within Project Area (ha)	Extent within Vegetation Clearance Footprint Area (ha)	
			DA2 Area	DA3 Area
Poplar Box (*Eucalyptus populnea*) Woodlands	11.3.2 and 11.12.17	83.1	1.3	-
Mixed Eucalyptus (Smooth-bark Dominant) Woodlands on Alluvial Plains	11.3.4 and 11.3.4a	166.4	-	-
Mixed Dry Eucalypt Woodlands on Rolling Granite Hills	11.12.1 and 11.12.3	23.4	0.0[5]	-
Melaleuca Dominant Open-Forests on Watercourses	11.3.25b and 11.3.25d	75.6	1.4	-

[5] Rounded down to 0.0 ha

Fauna Habitat Type	Associated REs	Extent within Project Area (ha)	Extent within Vegetation Clearance Footprint Area (ha)	
			DA2 Area	DA3 Area
Non-remnant Pasture Grasslands with Scattered Eucalypts	-	1,047.4	23.6	0.1
Artificial Farm Dams	-	6.8	0.2	-
Non-remnant Pasture Grasslands	-	2,226.6	115.8	11.2

4.4.1.1 Poplar Box (*Eucalyptus populnea*) Woodlands

This habitat type occurs across the Project Area as isolated remnant patches. This habitat type occurs primarily on igneous rocks and old alluvial plains, analogous with remnant REs 11.3.2 and 11.12.17. Dominant canopy vegetation within this habitat type included *Eucalyptus populnea* with associated *E. crebra*. A shrub layer was largely absent from this vegetation community. However, sometimes included *Petalstigma pubescens*, *Atalaya hemiglauca*, *Acacia salicina* and *Capparis canescens*. Key habitat features include tree hollows (although usually small in size), structurally complex mid-layer, leaf litter and cracking clay soils. The dominance of a eucalypt canopy provides a food resource for koala (*Phascolarctos cinereus*). This habitat type could fulfill the ecological requirements of this species, and it is reasonably possible that the habitat may be recolonised and support the species in the future or already provides movement corridors in the local area. The small to medium size of the hollows and isolated nature of the majority of patches renders this habitat largely unsuitable for threatened hollow dependent species such as southern greater glider (*Petauroides volans volans*). A representative photo of this habitat type is show in **Photo 4.3**.



Photo 4.3 Photograph representing the Poplar Box (*Eucalyptus populnea*) woodlands

4.4.1.2 Mixed Eucalyptus (Smooth-bark Dominant) Woodlands on Alluvial Plains

The mixed eucalypt (smooth-barked dominant) woodlands on drainage lines and alluvial plains habitat type occurred along the drainage lines of the Project Area or on alluvial plains where eucalypt species dominated the canopy layer. This habitat type was associated with the floodplains and tributaries of Maxwelton Creek and Lost Spring Creek and remained in some areas of the Project Area, although it had been subjected to land use changes from agricultural practices (such as land clearing, degradation from cattle, weeds, and dieback).

Two REs characterised this habitat type, including 11.3.4 (*Eucalyptus tereticornis* and / or *Eucalyptus spp*. woodland on alluvial plains) and 11.3.4a (*Blakella tessellaris* woodland). This habitat type occurred exclusively on the surface geologies of alluvial plains. **Photo 4.4** provides a representation of this habitat type. Where this habitat remained, mature *Eucalyptus spp*. and *Corymbia spp*. such as *E. tereticornis*, *Corymbia clarksoniana*, *E. crebra*, and *B. tessellaris* dominated the canopy layer and formed woodlands to open woodlands. A sparse shrub layer containing juvenile canopy species as well as *Lantana camara**, *Acacia salicina*, *Melaleuca viridiflora*, and *Petalostigma pubescens* were also observed. The ground layer was typically dominated by exotic and native grasses and forbs, including *Alloteropsis semialata*, *Sporobolus creber*, *Chloris inflata**, *Eragrostis spp*. *Aristida spp*. *Megathyrsus maximus**, *Lantana montevidensis**, *Cyperus spp*. *Perotis rara*, and *Scleria mackaviensis*.

This riparian habitat type was noted to have provided habitat opportunities for most fauna groups, as it included hollows, flowering canopy trees, decorticating bark, and scattered ground timber. These microhabitat features, along with the presence of water, created ideal habitat for species like the squatter pigeon (southern), which were recorded during field surveys. In some areas, the vegetation community had not been subjected to thinning and/or clearing. As such, canopy eucalypts were large and well developed, with canopy habitat features such as hollows and spouts common in medium and large size classes. Larger *E. tereticornis* present in this habitat type frequently contained hollows in trunks, which may have provided denning sites for arboreal mammals and microbats, as well as potential refuge and foraging opportunities for arboreal reptiles (such as arboreal snakes and monitors). In addition, these larger trees may provide nesting sites for hollow-dependent bird species, such as owls and parrots. Flowering canopy eucalypts were also likely to have supported foraging birds and flying-foxes, including the potentially occurring grey-headed flying fox (*Pteropus poliocephalus*) which is listed as Vulnerable under the EPBC Act.

Threatened species known or likely to occur in the Project Area that typically utilise medium to large tree hollows include the southern greater glider. As this habitat type was typically associated with the alluvial flats of watercourses, it was generally contiguous and could facilitate dispersal for the species and could provide refuge under future climate change scenarios. All dominant canopy species were also considered locally important koala trees (LIKTs) within the Brigalow Belt Bioregion (Youngentob et al. 2021) and provided a foraging resource for koalas. This habitat type could fulfill the ecological requirements of the species, and it is reasonably possible that the habitat may be recolonised and support the species in the future or already provides movement corridors in the local area. During times of drought, these trees can be used as climate refugia due to the higher moisture content and access to groundwater available on alluvial plains.



Photo 4.4 **Photograph Representing Mixed Eucalypt (Smooth-barked Dominant) Woodlands on Drainage Lines and Alluvial Plains**

4.4.1.3 Mixed Dry Eucalypt Woodlands on Rolling Granite Hills

This habitat type comprised moderately sized patches (approximately 10–20 ha) and was characterised by the dominance of mixed eucalypts forming an open-woodland to woodland (**Photo 4.5**). In areas where field surveys were conducted, this habitat type typically occurred on rolling hills derived from igneous rocks, aligning with REs 11.12.3 and 11.12.1. Patches of this habitat had been subjected to historical land-clearing processes and were predominantly ground-truthed to meet the condition threshold of regrowth, with areas of remnant vegetation dispersed throughout the Project Area.

The canopy was consistently dominated by *Eucalyptus crebra* with sub-dominant *E. tereticornis*, *Corymbia clarksoniana*, and *Blakella tessellaris*. A sparse to mid-dense lower tree layer was often absent, particularly in mature regrowth settings, though sometimes supported mixed eucalypts. The understorey often exhibited varying levels of complexity, from a very sparse to mid-dense layer consisting of *Geijera parviflora*, *Carissa ovata* (currantbush), *Psydrax odorata*, *Petalostigma pubescens*, *Vachellia bidwillii*, and/or *Acacia spp*. which was occasionally present. Mistletoe was either absent or rarely recorded in this habitat during field surveys. Nevertheless, suitable foraging conditions for a range of nectar-feeding and foliage-gleaning birds occurred due to the dominance of myrtaceous species. Stags, and in some locations, canopy trees occasionally bore small and medium-sized hollows. Large hollows were generally absent. In areas of mature regrowth vegetation, hollows were either rare or absent.

Ground layer microhabitat features included occasional coarse woody debris, fallen logs, and small areas of thin leaf litter (primarily directly beneath canopy trees). The ground layer was often dominated by native grass tussocks, including *Eragrostis spp*. *Aristida spp*. *Chloris spp*. and *Panicum spp*. Stones and small boulders were locally abundant, though their occurrence depended heavily on the surface geological features of a particular area.

Based on the presence and abundance of key habitat features, this fauna habitat type potential to support a range of conservation significant species, including the koala, squatter pigeon (southern), grey-headed flying fox, yakka skink (Egernia rugosa), white-throated needletail (*Hirundapus caudacutus*), satin flycatcher (*Myiagra cyanoleuca*), black-faced monarch (*Monarcha melanopsis*), oriental cuckoo (*Cuculus optatus*) and short-beaked echidna (*Tachyglossus aculeatus*). Additionally, this habitat type provides foraging and dispersal opportunities for the southern greater glider, particularly offering potential dispersal corridors that could lead to areas with suitable denning habitat for this species.



Photo 4.5 Photograph Representing Mixed Dry Eucalypt Woodlands on Rolling Granite Hills

4.4.1.4 Melaleuca Dominant Open-Forests on Watercourses

This habitat occurs largely as narrow, linear patches along watercourses. It is notably prevalent in the central Project Area associated with Maxwelton Creek and Lost Spring Creek, however most unnamed watercourses of various stream orders were characterised by the dominance of Melaleuca spp. Although habitat is fragmented and disturbance from weeds, cattle grazing and some stream bank erosion is present, areas of this habitat has rarely been thinned or cleared, and being associated with watercourses, are generally well watered. As such, canopy trees were often large and well developed and are considered likely to provide important fauna movement opportunities within the landscape.

The canopy consisted of *Melaleuca viridiflora*, *Melaleuca fluviatilis* and *Melaleuca bracteata* with subdominant *Casuarina cunninghamiana*, characteristic with REs 11.3.25b and 11.3.25d. The mid-dense shrub layer consisted of juvenile canopy and sub-canopy species and high infestations of exotic *Lantana camara**, *Cryptostegia grandiflora**, *Maclura cochinchinensis* and *Cardiospermum grandiflorum**. The ground-layer consisted of predominately exotic grasses and forbs, including *Praxelis clematidea*, *Euphorbia heterophylla** and *Megathyrsus maximus**.

Within the Project Area, this habitat type was generally associated with permanent and seasonally inundated (i.e. ephemeral) water sources including creek lines and defined bed and banks (**Photo 4.6**). Such conditions create suitable habitat for a range of common amphibian species and other water-dependent fauna species. Given the proximity to water, koalas may utilise habitat as refuge when water availability in the landscape is low. Banks were particularly steep in some locations in the central Project Area. Where this occurs fauna movement may be hindered.

The structural complexity in the ground layer and shrub-layer provided ground-dwelling species with protection from predation and supported the breeding and foraging needs of smaller-bodied species, Habitat resources suitable for mammals, such as native rodents, macropods, echidnas, and dasyurids, included native grasses, leaf litter, and woody debris. Furthermore, this habitat type is of particular importance to a range of woodland bird species, including the special least concern oriental cuckoo, due to the availability of foraging resources in combination with shelter from aerial predators.



Photo 4.6 Photograph Representing Melaleuca Dominant Open-forests on Watercourses

4.4.1.5 Non-remnant Pasture Grasslands with Scattered Eucalypts

Cleared grassy paddocks as a result of historical, ongoing clearing and livestock grazing practices covered over half of the Project Area (**Photo 4.7**). Habitat values in this community were very limited with isolated scattered paddock trees (7–14 m), sparse shrubs and the presence of native and exotic grasses in the ground layer.

This habitat type does not contain any remnant vegetation of a patch size that would comprise an RE, and therefore no REs has been assigned to these areas. Within the Project Area, this habitat type occurs on two surface geologies, namely alluvial and igneous rocks. The 'paddock trees' generally comprised of canopy species of the vegetation community that have been present prior to historic clearing in area. Emergent canopy trees consisted of *Eucalyptus tereticornis*, *Corymbia clarksoniana*, *E. crebra* and *Blakella tessellaris* were rare and lacked habitat features such as hollows and arboreal termite nests. Grasses typically comprised improved pasture species such as *Chloris Gayana** and *Bothriochloa pertusa** with *Heteropogon contortus* and *Bothriochloa bladhii*.

Habitat features present within this fauna habitat type are limited, however, are considered suitable to support some ecological requirements of threatened species known or potentially occurring within the Project Area. Eucalypt trees provide marginal foraging opportunities for koalas and are more likely used by this species for dispersal through the broader landscape. The lightly timbered complex of this habitat type also supports foraging and dispersal opportunities for squatter pigeon (southern).



Photo 4.7 Photograph Representing Non-remnant Pasture Grasslands with Scattered Eucalypts

4.4.1.6 Artificial Farm Dams

Waterbodies are present throughout the Project Area, generally comprising small farm dams (often <1 ha) (**Photo 4.8**) that are regularly used by cattle. Farm dams are generally of low habitat quality; cattle pugging at the water's edge is common and fringing vegetation (aquatic and canopy) is rare. During the field survey, farm dams were found to generally contain only highly turbid water with some common duck species utilising them. Water quality within the dams is expected to be poor as a result of the frequent cattle use and disturbance.

There was one farm dam which was larger in comparison to the others present, located in the northwestern extent of the Project Area. At this location, it was noted that fauna habitat opportunities were greater; with gently sloping banks, fringing canopy trees, higher aquatic plant diversity (i.e. *Juncus spp*.) and less evidence of cattle pugging at the water's edge (**Photo 4.8**).

Despite the general poor quality of the farm dams and modified wetlands, it is acknowledged that they may still provide a reliable water source for a range of fauna species, including migratory and threatened waterbirds. The likely permanence of the water also suggests daily water source opportunities are provided to the squatter pigeon (southern). This habitat type supports foraging and dispersal opportunities for migratory species.



Photo 4.8 Photograph Representing an Artificial Farm Dam

4.4.1.7 Non-remnant Pasture Grasslands

This fauna habitat type is characterised as low value cleared land used for livestock grazing. Canopy cover and shrub cover is typically sparse to absent, whilst grass cover varies dependent on pressures present but is typically very dense. Grasses typically comprised pasture species such as *Chloris gayana** and *Bothriochloa pertusa**. These grasses occur in varying quantity and composition with some areas supporting a high diversity of ground layer vegetation, and others forming a homogenous pasture. Scattered *Vachellia bidwillii* and *Blakella tessellaris* was present in some locations (3–4 m). This fauna habitat type occurs on each of the different surface geology types that are found within the Project Area. A representative photograph of this habitat type is shown in below (**Photo 4.9**).

Confirmed MSES associated with this habitat type included the squatter pigeon (southern). This species was recorded utilising non-remnant areas, particularly adjacent to access tracks and within proximity to waterbodies, where foraging resources are available, and shelter habitats (such as remnant or regrowth woodland) occur within a short flying distance. This habitat also supports dispersal of some species, such as threatened birds travelling over cleared areas between habitat patches or on migration. Medium sized mammals, such as koala, which are able to disperse over open areas may also utilise this habitat type to access areas of more suitable habitat.

Complex microhabitat features in the ground layer were largely absent and limited to occasional small stones on the low hills across the Project Area. Large fauna species such as macropods and emus exploit the open landscape and grazing resources within the ground layer, including forbs and grasses. The pasture may also provide some dispersal opportunities for commonly occurring small mammals and reptiles. Raptors, granivorous birds and larger mammal species may forage in this habitat.



Photo 4.9 Photograph Representing Non-remnant Pasture Grasslands

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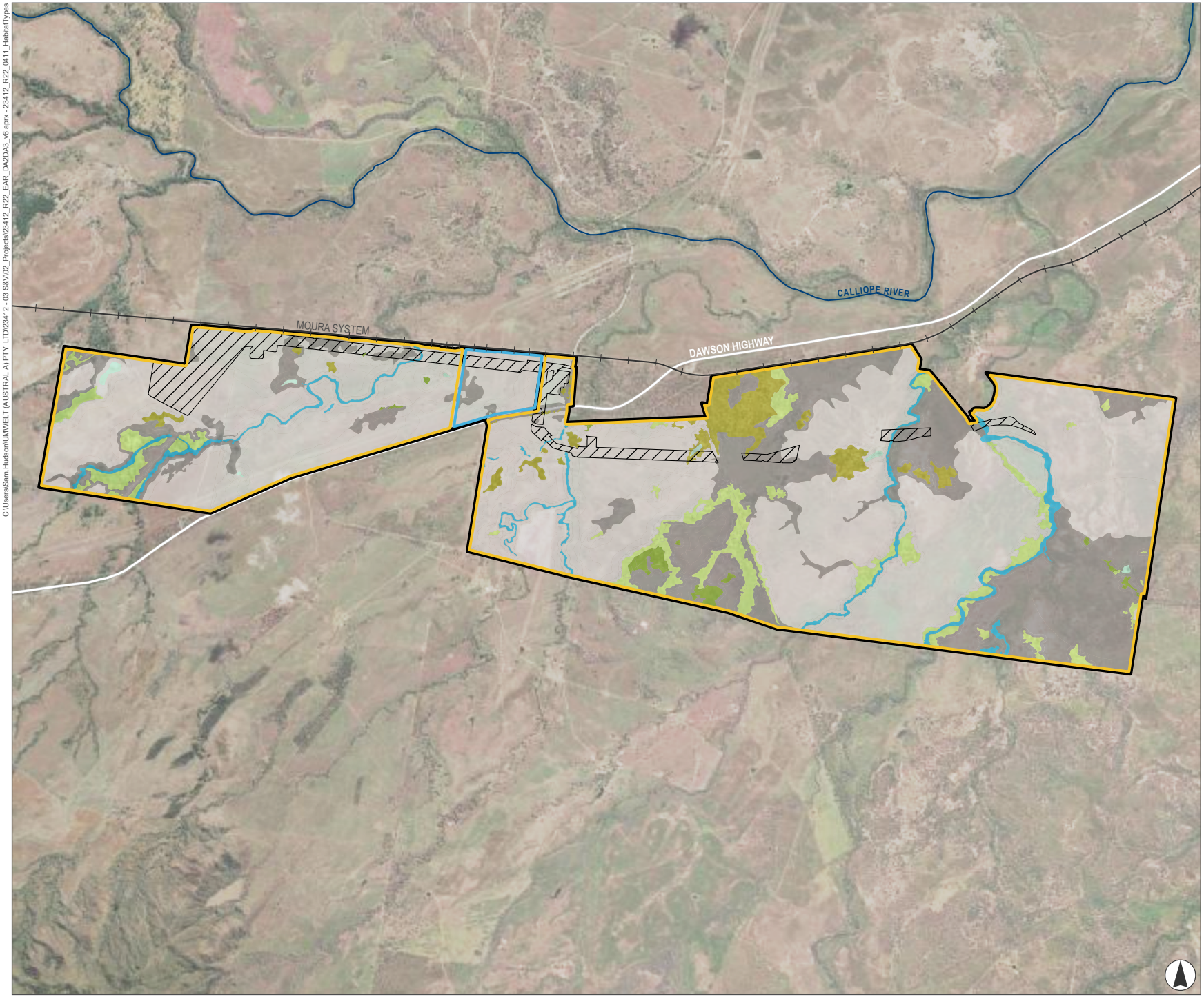


FIGURE 4.11

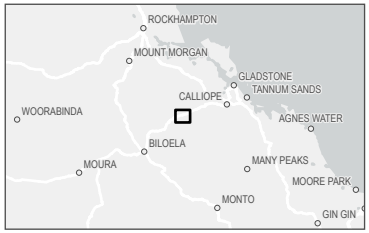
Fauna Habitat Types

Legend

- Project Area
- Project Area (DA2)
- Project Area (DA3)
- Vegetation Clearance Footprint (DA2 & DA3)
- Major Watercourse
- Major Roads
- Railways

Fauna Habitat Type

- Artificial Farm Dams
- Melaleuca Dominant Open-Forests on Watercourses
- Mixed Dry Eucalypt Woodlands on Rolling Granite Hills
- Mixed Eucalyptus (Smooth-bark Dominant) Woodlands on Alluvial Plains
- Non-remnant Pasture Grasslands
- Non-remnant Pasture Grasslands with Scattered Eucalypts
- Poplar Box (Eucalyptus populnea) Woodlands



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4.4.2 Fauna Diversity

A total of 92 fauna species were identified during the field survey program, comprising of 58 birds, 26 mammals, four reptiles and four amphibian species, including introduced species. A full list of the fauna species recorded within the Project Area is provided in **Appendix C**.

4.4.3 Threatened Fauna

The desktop assessment identified 39 NC Act and EPBC Act listed threatened fauna species that have been historically recorded (WildNet, ALA) or predicted to occur (PMST) within 20 km of the Project Area. A review of the ALA Database and WildNet Database indicate that 14 NC Act and EPBC Act listed species have been historically recorded within 20 km of the Project Area (refer to **Figure 4.12** and **Appendix A**).

The ecological field surveys confirmed the presence of one threatened fauna species: squatter pigeon (southern), listed as Vulnerable under the EPBC Act and NC Act (**Section 4.4.3.1**). No other threatened fauna species were recorded during the field survey program.

Following the field assessments conducted to date and based on species' habitat preferences, no threatened fauna species listed under the NC Act and EPBC Act have a 'High' likelihood of occurrence within the Project Area. Six threatened fauna species (5 of which are listed under the NC Act) are considered to have a 'Moderate' likelihood of occurrence (**Table 4.8**). Species habitat mapping was developed and is detailed in **Section 3.3** and includes discussions of known and potential habitat.

All remaining threatened species are regarded as having a 'Low' likelihood of occurrence or are considered not to occur within the Project Area. These species are not discussed further. Refer to **Appendix B** for the full likelihood of occurrence assessment.

Table 4.8 Threatened Fauna: Likelihood of Ocuurrence Results

Scientific Name	Common Name	NC Act Status	EPBC Act Status
Known			
Geophaps scripta scripta	squatter pigeon (southern)	Vunerable	Vulnerable
Moderate			
Petauroides volans volans	southern greater glider	Endangered	Endangered
Phascolarctos cinereus	koala	Endangered	Endangered
Egernia rugosa	yakka skink	Vulnerable	Vulnerable
Hirundapus caudacutus	white-throated needletail	Vulnerable	Vulnerable
Gallinago hardwickii	Latham's snipe	Vulnerable	Vulnerable
Pteropus poliocephalus	grey-headed flying fox	Least concern	Vulnerable

4.4.3.1 Squatter Pigeon (Southern) (*Geophaps Scripta Scripta*)

The squatter pigeon (southern) is a ground-foraging granivore associated with dry, open sclerophyll woodlands and savannahs on well-draining soils. Requiring daily access to drinking water, the species seldom occurs far (>3 km) from water (Squatter Pigeon Workshop, 2011; Threatened Species Scientific Committee, 2015).

In the Brigalow Belt bioregion, the species occurs mainly in remnant and regrowth woodland dominated by *Eucalyptus*, *Corymbia*, *Acacia* or *Callitris spp*. on sandy or loamy soils associated with low, gently sloping, flat to undulating plains and foothills (including land zones 3 and 5), and lateritic (duplex) soils on low 'jump-ups' and escarpments (i.e. land zone 7) (Squatter Pigeon Workshop, 2011; Threatened Species Scientific Committee, 2015).

Feeding mainly on fallen seed, squatter pigeon prefers to forage in areas of lower, more open ground cover (including the margins of dirt roads and cattle yards) where the ground stratum comprises mostly native, perennial tussock grasses, and/or a mix of perennial tussock grasses and low shrubs/forbs, with a projective foliage cover of ~33% (Squatter Pigeon Workshop, 2011; Threatened Species Scientific Committee, 2015).

While predominantly ground-dwelling, the species roosts in trees overnight and, as such, requires access to canopy trees for shelter (Squatter Pigeon Workshop, 2011). Nests are typically constructed in remnant woodland vegetation beneath grass tussocks, bushes or alongside fallen logs in areas of woodland within 1 km of water (Squatter Pigeon Workshop, 2011; Threatened Species Scientific Committee, 2015).

A total of 12 squatter pigeons (southern) were observed within the Project Area during surveys undertaken by Umwelt. The squatter pigeon (southern) was recorded in cleared areas, adjacent to access tracks, and areas more heavily impacted by grazing with lower, more open grass cover suitable for foraging. All birds recording during the field surveys were recorded within 1 km of permanent water. Squatter pigeon (southern) was not detected in any areas of woodland habitat, highlighting the species reliance on areas of lower, more open canopy cover. Locations where squatter pigeon (southern) was observed during ecological field surveys are shown on **Figure 4.12**.

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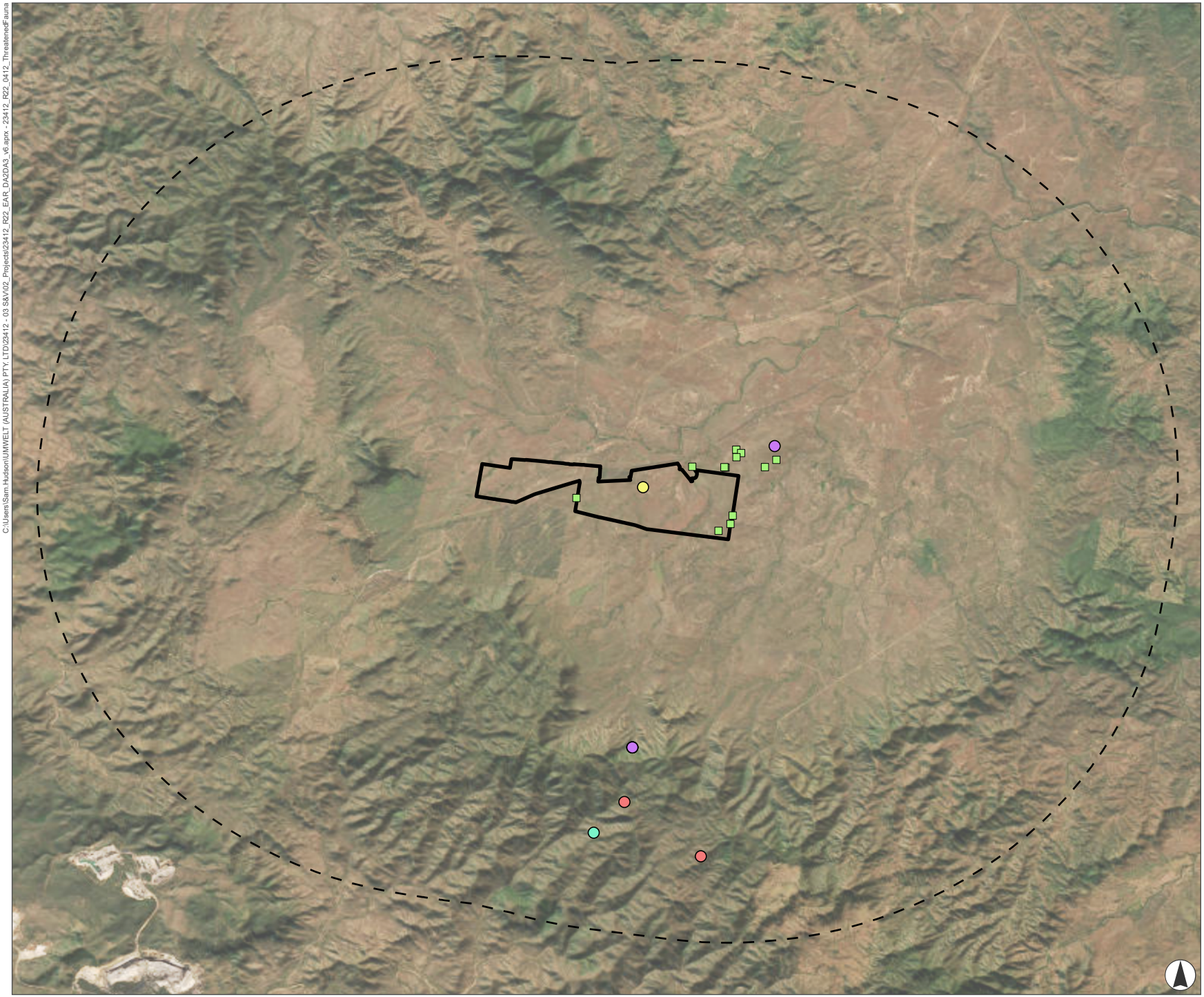


FIGURE 4.12

Threatened Fauna Records

Legend

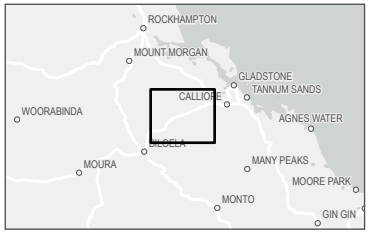
- Project Area
- 20km Project Area Buffer

Desktop Records

- Greater Glider *(Petauroides volans)*
- Koala *(Phascolarctos cinereus)*
- Tusked Frog *(Adelotus brevis)*
- White-throated Needletail *(Hirundapus caudacutus)*

Umwelt Records

- Squatter Pigeon *(Geophaps scripta scripta)*



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4.4.4 Special Least Concern Fauna (NC Act)

A total of nine special least concern fauna species listed under the NC Act were identified during the desktop searches across the Project Area, including a 20 km buffer (refer to **Figure 4.13** and **Appendix A**).

No special least concern fauna species were observed during the field surveys. The likelihood of occurrence assessment determined the short-beaked echidna (*Tachyglossus aculeatus*), listed as special least concern (non-migratory) under the NC Act, as having a 'High' likelihood of occurrence within the Project Area. This species was not detected during field surveys; however, the confirmation of suitable habitat and proximity of records suggests that it is 'likely' to occur.

A further three special least concern fauna species have a 'Moderate' likelihood of occurrence, all of which are also listed as Migratory species under the EPBC Act (**Table 4.9**). Species habitat mapping was developed and is detailed in **Section 3.3**. Locations of the desktop records of any NC Act special least concern species previously recorded within the Project Area or 20 km buffer is depicted in **Figure 4.13**.

All remaining special least concern species are regarded as having a 'Low' likelihood of occurring or are unlikely to occur within the Project Area and therefore will not be discussed further. Refer to **Appendix B** for the full likelihood of occurrence assessment.

Table 4.9 Special Least Concern Fauna: Likelihood of Occurrence Results

Scientific Name	Common Name	NC Act Status	EPBC Act Status
High			
Tachyglossus aculeatus	short-beaked echidna	Special Least Concern (Non-migratory)	-
Moderate			
Apus pacificus	fork-tailed swift	Special Least Concern (Migratory)	Migratory
Cuculus optatus	oriental cuckoo	Special Least Concern (Migratory)	Migratory
Pandion haliaetus	eastern osprey	Special Least Concern (Migratory)	Migratory

4.4.4.1 Short-beaked Echidna (*Tachyglossus Aculeatus*) (Non-migratory)

The short-beaked echidna occurs in a wide range of habitats across continental Australia and may be found in areas of intact and disturbed native vegetation wherever ants and termites (on which the echidna feeds) are plentiful. The species favours areas where bushes, hollow logs, rock/boulder piles, burrows and woody debris provide shelter for resting and/or breeding animals (Augee et al. 2006; Van Dyck & Strahan, 2008).

This species is likely to occur broadly within the Project Area will all areas of remnant, regrowth and non-remnant vegetation providing suitable habitat for the species.

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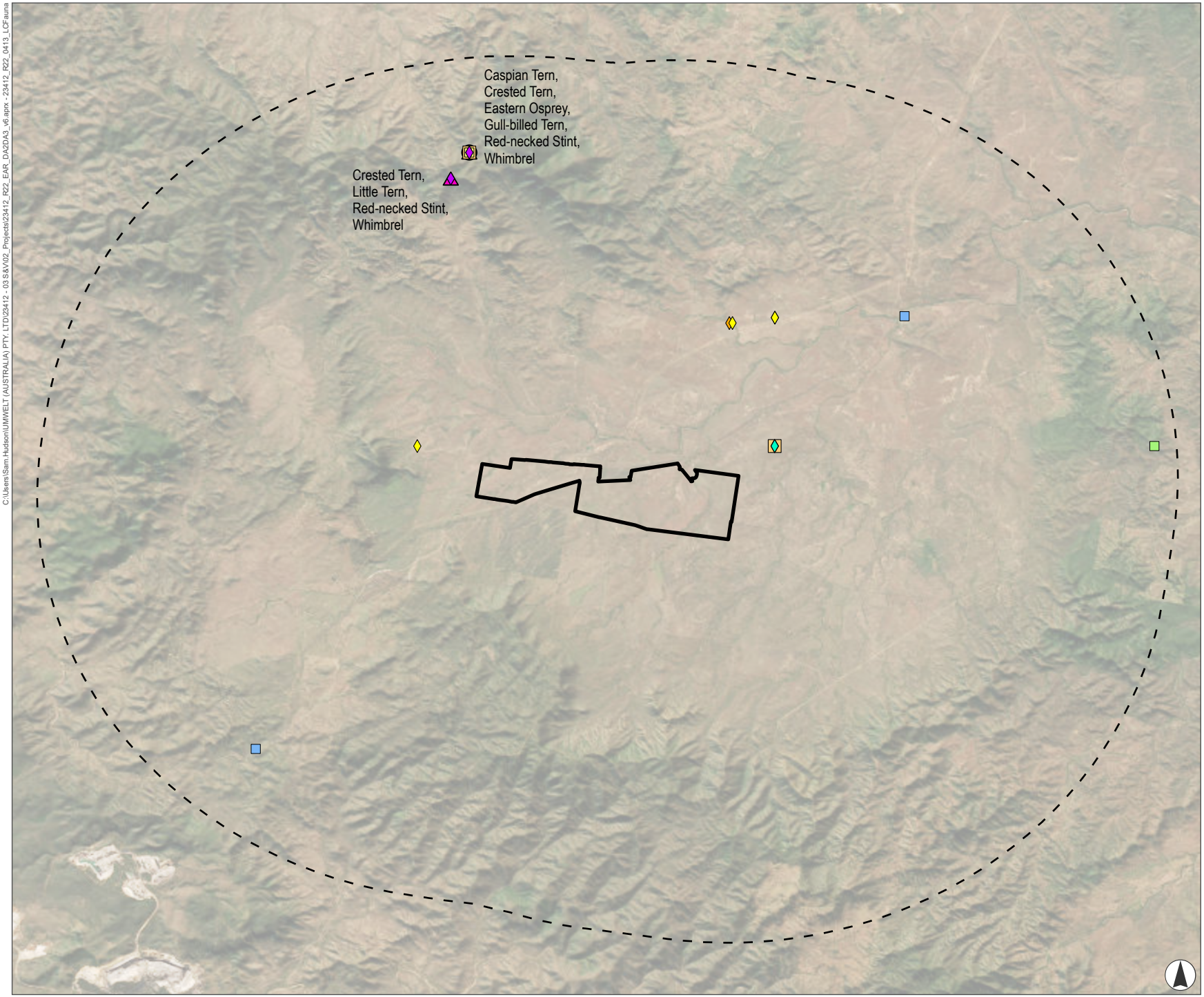


FIGURE 4.13

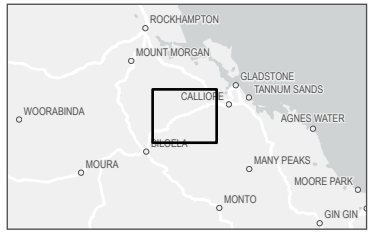
Special Least Concern (Migratory and Non-migratory) Fauna Records

Legend

- Project Area
- 20km Project Area Buffer

Desktop Records

- Caspian Tern *(Hydroprogne caspia)*
- Crested Tern *(Thalasseus bergii)*
- Double-banded Plover *(Charadrius bicinctus)*
- Eastern Osprey *(Pandion haliaetus)*
- Glossy Ibis *(Plegadis falcinellus)*
- Gull-billed Tern *(Gelochelidon nilotica)*
- Little Tern *(Sternula albifrons)*
- Marsh Sandpiper *(Tringa stagnatilis)*
- Red-necked Stint *(Calidris ruficollis)*
- Short-beaked Echidna *(Tachyglossus aculeatus)*
- Whimbrel *(Numenius phaeopus)*
- Wood Sandpiper *(Tringa glareola)*



0 2 4

Kilometres

Scale 1:260,000 at A4
GDA1994 Zone 56

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Image Source: ESRI Basemap (2025) | **Data Source:** QLD DoR (2025)

4.4.5 Introduced Fauna

Pest fauna species have varying adverse impacts on the environment. Feral pigs (*Sus scrofa**) are known to contribute to habitat degradation by damaging the banks of wetlands, creek lines, uprooting vegetation, causing soil erosion, spreading weeds and browsing/grazing on native flora (Department of Climate Change Energy the Environment and Water, 2021). Carnivorous pest fauna such as feral cats (*Felis catus**) and wild dogs (*Canis familiaris**), are known to directly predate native fauna, including identified threatened fauna species, and compete for foraging resources with other carnivorous native fauna (Department of Climate Change, Energy, the Environment and Water, 2024).

The field program identified 5 introduced fauna species listed as a restricted invasive species under the Biosecurity Act (**Table 4.10**). All pest fauna recorded during the field survey are listed in **Appendix C**.

Table 4.10 Introduced Fauna Observed During Field Surveys

Scientific Name	Common Name	Biosecurity Act Status
Rhinella marina*	cane toad	Category 3
Felis catus*	feral cat	Category 3
Lepus europaeus*	European brown hare	Category 3
Sus scrofa*	pig	Category 3
Oryctolagus cuniculus*	rabbit	Category 3

4.5 Threatened and Special Least Concern Species Habitat Modelling

Following the completion of the likelihood of occurrence assessment, field investigations and the mapping of vegetation communities, mapping for the NC Act and EPBC Act listed threatened, or NC Act listed special least concern species which are 'Known' or considered to have a 'High' or 'Moderate' likelihood of occurrence within the Project Area was undertaken. A summary of habitat extents for threatened fauna species within the Project Area is provided in **Table 4.11** and a figure series depicting mapped suitable habitat for each threatened species is provided in **Appendix E**. The habitat mapping criteria and mapping justification for this assessment is provided in **Appendix D**.

Table 4.11 Threatened Species Habitat Summary

Species	NC Act Status	EPBC Act Status	Habitat Categories	Extent within the Project Area (ha)	Extent within the Vegetation Clearance Footprint (ha)		Figure Reference (Appendix E)
					DA2 Area	DA3 Area	
short-beaked echidna	SLC	-	Breeding, foraging and dispersal	**2,669.8**	**142.1**	**11.3**	**Figure E.1**
squatter pigeon (southern)	V	V	Foraging and breeding	293.1	2.7	-	**Figure E.2**
			Foraging	26.7	-	-	
			Dispersal	835.6	33.2	-	
			Potential water source	6.1	0.2	-	
			Total	**1,161.5**	**36.1**	**-**	

Species	NC Act Status	EPBC Act Status	Habitat Categories	Extent within the Project Area (ha)	Extent within the Vegetation Clearance Footprint (ha)		Figure Reference (Appendix E)
					DA2 Area	DA3 Area	
white-throated needletail	V	V, Mi	Foraging roosting	181.9	1.6	-	**Figure E.3**
			Dispersal and marginal foraging	2,494.0	140.8	11.3	
			Total	**2,675.9**	**142.4**	**11.3**	
southern greater glider	E	E	Likely or current denning	109.0	-	-	**Figure E.4**
			Potential or future denning	61.7	-	-	
			Foraging and dispersal	76.6	1.2	-	
			Total	**247.3**	**1.2**	**-**	
koala	E	E	Climate refugia	65.0	1.4	-	**Figure E.5**
			Breeding and foraging	247.0	1.3	-	
			Shelter	7.8	-	-	
			Dispersal (with trees)	642.4	23.6	0.1	
			Dispersal (without trees)	1,707.5	115.8	11.2	
			Total	**2,669.8**	**143.0**	**11.3**	
yakka skink	V	V	Suitable Habitat	**15.6**	**-**	**-**	**Figure E.6**
Latham's snipe	V	V	Foraging and Roosting	**6.1**	**0.2**	**-**	**Figure E.7**
fork-tailed swift	SLC	Mi	Foraging and Dispersal	**2,675.9**	**142.4**	**11.3**	**Figure E.8**
oriental cuckoo	SLC	Mi	Foraging and Dispersal	**170.3**	**1.4**	**-**	**Figure E.9**
Eastern osprey	SLC	Mi	Foraging and Dispersal	**75.1**	**1.6**	**-**	**Figure E.10**
grey-headed flying-fox	LC	V	Foraging	**182.7**	**0.0**[6]	**-**	**Figure E.11**

[6] Rounded down to 0.0 ha

4.6 Matters of State Environmental Significance

Prescribed environmental matters or MSES values are derived from Schedule 2 of the EO Regulation. A summary of all MSES values is presented in **Table 4.12**. MSES identified within the Project Area or Vegetation Clearance Footprint are annotated with a Yes/No in the Table, including the requirement for a SRI.

Table 4.12 MSES Summary

MSES	Description	Presence within the Project Area and DA2 and DA3 Vegetation Clearance Footprint	Requirement for a SRI
Regulated Vegetation	MSES Regulated Vegetation was assessed using Queensland Government Regulated Vegetation Management Map, as issued by the DoNRMMRRD (Department of Natural Resources and Mines, Manufacturing and Regional and Rural Development, 2025a) (refer to **Figure 4.6** and **Appendix A**). MSES Regulated Vegetation has been defined under the EO Regulation as prescribed REs that are: • 'Endangered' or 'Of Concern'; or • That intersects with an area shown as a wetland on the vegetation management wetlands map, or • For a prescribed activity mentioned in Schedule 1, Item 7(e), if the ecosystem is an area of the essential habitat on the essential habitat map for an animal that is near threatened wildlife or a plant that is near threatened wildlife, or • To the extent the ecosystem is located within a defined distance from the defining banks of a relevant watercourse or relevant drainage feature. In accordance with the Queensland Environmental Offset Policy, distances from the defining bank of the watercourse Stream Order (non-coastal Bioregion) comprise: ○ 25 m for Stream Order 1 and 2 ○ 50 m for Stream Order 3 and 4	**No** No prescribed REs are mapped within the Project Area or Vegetation Clearance Footprint Nor is there any Regulated Vegetation within a defined distance of a watercourse is mapped within the Project Area or Vegetation Clearance Footprint. No wetlands or essential habitat are mapped within the Project Area or Vegetation Clearance Footprint.	**No**

MSES	Description	Presence within the Project Area and DA2 and DA3 Vegetation Clearance Footprint	Requirement for a SRI
	○ 100 m for Stream Order 5 or greater. As defined by the EO Regulation, non-remnant or regrowth vegetation is not application to this MSES.		
Connectivity Areas (non-urban areas)	Connectivity areas are areas of mapped remnant vegetation (Category B) outside urban areas containing prescribed REs (endangered or of concern) that are required for ecosystem functioning (a connectivity area).	**No** No Category B regulated vegetation is mapped within the Project Area or Vegetation Clearance Footprint.	**No**
Wetlands and Watercourses	An offset may be required for the following wetlands and watercourses: • wetland in a wetland protection area • wetland of high ecological significance • wetland or watercourse in a high ecological value water.	**No** No mapped WPAs intersects the Project Area. No wetlands of high ecological significance or wetlands or watercourses in a high ecological values water are mapped within the Project Area or Vegetation Clearance Footprint.	**No**
Strategic Environmental Areas	Strategic Environmental Areas are: • the Cape York Strategic Environmental Area • the Channel Country Strategic Environmental Area • the Frazer Island Strategic Environmental Area • the Gulf Rivers Strategic Environmental Area. • the Hinchinbrook Island Strategic Environmental Area.	**No** No strategic environmental areas occur within or adjacent to the Project Area or Vegetation Clearance Footprint.	**No**
Protected Wildlife Habitat	Protected wildlife habitat is defined as an area of habitat (e.g. foraging, roosting, nesting or breeding habitat) for an animal or plant that is endangered or vulnerable, or a special least concern (non-migratory) animal under the NC Act. Offsets may be required for the following protected wildlife habitat: • an area that contains plants that are 'endangered', 'vulnerable' or 'near threatened' wildlife	**Yes** The Project Area contains MSES Protected Wildlife habitat for six fauna species listed as threatened or special least concern (non-migratory) under the NC Act: • squatter pigeon (southern) (*Geophaps scripta scripta*) • koala (*Phascolarctos cinereus*) • white-throated needletail (*Hirundapus caudacutus*)	**No - not a prescribed environmental matter under State code 16 and are therefore exempt from Significant Residual Impact assessment for this Project**

MSES	Description	Presence within the Project Area and DA2 and DA3 Vegetation Clearance Footprint	Requirement for a SRI
	• a habitat for an animal that is 'endangered', 'vulnerable' or 'near threatened' wildlife or a special least concern animal (non-migratory), including areas or features used by an animal for foraging, roosting, nesting or breeding • Koala habitat that is classified as essential habitat on the essential habitat map • an area shown as bushland habitat, high value rehabilitation habitat or medium value rehabilitation habitat on the map called 'Map of Assessable Development Area Koala Habitat Values' that applies under the *South East Queensland Koala Conservation State Planning Regulatory Provisions* (now repealed).	• southern greater glider (*Petauroides volans volans*) • short-beaked echidna (*Tachyglossus aculeatus*) • Latham's snipe (*Gallinago hardwickii*)	
Protected Areas	An offset may be required for the following classes of protected areas: • national parks • national parks (Aboriginal land) • national parks (Torres Strait Islander land) • national parks (Cape York Peninsula Aboriginal land) • regional parks • nature refuges.	**No** No protected areas occur within or adjacent to the Project Area.	**No**
Fish Habitat Areas and Highly Protected Zones of State marine parks	Declared Fish Habitat Areas protect critical wetlands to ensure fisheries productivity and legal fishing access to these areas. The highly protected zones of the marine parks are defined as a prescribed environmental matter and therefore permissions for works within these zones are subject to offset considerations. These highly protected zones are: • preservation zones • marine national park zones	**No** No state marine parks or fish habitat areas occur within or adjacent to the Project Area.	**No**

MSES	Description	Presence within the Project Area and DA2 and DA3 Vegetation Clearance Footprint	Requirement for a SRI
	• scientific research zones • buffer zones • conservation park zones.		
Waterways for Waterway Barrier Works	An environmental offset may be required for any part of a waterway that provides for passage of fish (other than that part of a waterway within an urban area) if the construction, installation or modification of waterway barrier works carried out under an authority will limit the passage of fish along the waterway.	**Yes** A review of the Queensland Waterways for Waterway Barrier Works mapping identified that the Project Area contain mapped Low, Moderate, High and Major impact waterways. The Vegetation Clearance Footprint intersects: • Low, Moderate, High and Major impact waterways in the DA2 Area, and • Moderate impact waters in the DA3 Area.	**No - not a prescribed environmental matter under State code 16 and are therefore exempt from Significant Residual Impact assessment for this Project**
Marine Plants	Marine plants are protected under the Fisheries Act. Marine plants are part of the mosaic of fish habitats and are an integral and usually highly visible feature of the coastline.	**No** No marine plants are found within or adjacent to the Project Area.	**No**
Legally Secured Offset Area under State Legislation	Legally secured offset areas are any areas declared as an environmental offset protection area, high nature conservation value under the VM Act or another area prescribed under a regulation.	**No** No legally secured offset areas are present within or adjacent to the Project Area.	**No**

5.0 Potential Impacts

Information on the potential impacts associated with the Project are outlined in the sections below. Avoidance, mitigation and management measures to reduce the extent or severity of these potential impacts on the relevant MSES values are outlined in **Section 6.0**.

Activities proposed as part of the Project have been categorised into three phases: construction, operations and maintenance, and decommissioning and rehabilitation.

5.1 Construction

The greatest risk of adverse impact on MSES and biodiversity more broadly from the Project will occur during the construction phase. The construction activities to support the installation of transmission lines, the switchyard and access tracks will involve some vegetation clearing as well as excavation works and ground reinstatement. While these DAs will be lodged following DA1 (separate DA subject to SARA approval, as discussed in **Section 1.3**), cumulative impacts have been considered, and the co-location of the OHTL with the solar farm, where practicable, has minimised potential direct and indirect impacts. Direct and indirect impacts potentially associated with these activities are described below.

5.1.1 Vegetation Clearance and Habitat Loss

Vegetation clearing is a direct impact that can result in the loss of vegetation and associated habitat values. Potential impacts can include:

- Reduced patch size of vegetation communities potentially compromising the viability of the community and associated habitat.
- Loss of habitat causing a reduction of biological diversity or loss of local populations and genotypes.
- Loss of, or disturbance to, microhabitat features such as tree hollows, leaf litter, ground timber and dense shrubs.
- Loss of floristic diversity and the food resources this provides such as foliage, flowers, nectar, fruit and seeds.
- Fragmentation of habitats resulting in reduced dispersal opportunities for fauna.
- Reduction of abiotic features necessary to support vegetation communities and habitat types.

The Project design has been sited within the Project Area to maximise the use of cleared areas and minimise habitat fragmentation impacts, resulting in a significantly reduced vegetation clearing requirement. The extent of direct impacts to ecological values as a result of vegetation clearing under a worst-case scenario is detailed in **Table 5.1.**

Approximately 243.3 ha of remnant and 76.6 ha of regrowth vegetation was ground-truthed within the Project Area. Vegetation clearing for the Project will require a maximum direct disturbance of 1.7 ha of remnant and 1.1 ha of regrowth vegetation, all of which occurs within the DA2 Area. No remnant or regrowth vegetation will be impacted within the DA3 Area (**Figure 4.8**).

In the DA3 Area, the Vegetation Clearance Footprint will be limited to non-remnant grassed areas. Despite this, these areas may still provide limited habitat for three MSES species (koala, short-beaked echidna, and the white-throated needletail). However, given the modified nature of the vegetation, potential impacts on these species are expected to be low.

The extent of vegetation clearing will be minimised as far as practical during detailed design. Where clearance of vegetation for the Project is unavoidable, it will only be completed as strictly necessary. In addition, a range of measures will be implemented to minimise the overall level of impact from clearing, as discussed in **Section 6.2.1.1**.

Construction of the Project and the associated vegetation clearing will be undertaken in a progressive or staged manner across the Vegetation Clearance Footprint. Areas within the Vegetation Clearance Footprint will only be cleared when construction activities are due to commence in that area. Most clearing impacts (associated with the 60 m OHTL easement) will be permanent for the life of the Project, though some temporary construction areas, laydowns, and access tracks will be rehabilitated post-construction. Staging will limit impacts to small areas within the Vegetation Clearance Footprint and Project Area at any time. For some species (e.g. koala), this localised impact will allow time for individuals to temporarily relocate away from any disturbances. However, for species with a small home range or reduced dispersal capabilities (e.g. skinks, frogs) this may cause localised population depletion.

The maximum extent of direct impacts as a result of vegetation clearing within the Vegetation Clearance Footprint for MSES values is provided in **Table 5.1** separated by the DA2 and DA3 Areas.

No MSES Regulated Vegetation (including Essential Habitat and Connectivity Areas) is mapped within the Project Area or DA2 and DA3 Vegetation Clearance Footprint and impacts to species habitat has been confined to areas of non-remnant vegetation and minimised to the greatest extent possible.

Table 5.1 Direct Impact to MSES

Ecological Value	Likelihood of Occurrence	Habitat Utilisation	Area within the Project Area (ha)	Maximum Direct Impact Area (ha) within the Vegetation Clearance Footprint		Figure Reference
				DA2 Area	DA3 Area	
MSES Protected Wildlife Habitat (Threatened and Special Least Concern (Non-migratory) Fauna						
koala *Phascolarctos cinereus*	Moderate	Climate refugia	65.0	1.4	-	**Figure E.5**
		Breeding and foraging	247.0	1.3	-	
		Shelter	7.8	-	-	
		Dispersal (with trees)	642.4	23.6	0.1	
		Dispersal (without trees)	1,707.5	115.8	11.2	
short-beaked echidna *Tachyglossus aculeatus*	High	Breeding, dispersal and foraging	2,669.8	142.1	11.3	**Figure E.1**
southern greater glider *Petauroides volans*	Moderate	Likely or current denning habitat	109.0	-	-	**Figure E.4**
		Potential or future denning habitat	61.7	-	-	
		Foraging and dispersal	76.6	1.2	-	
yakka skink *Egernia rugosa*	Moderate	Suitable habitat	15.6	-	-	**Figure E.6**
squatter pigeon (southern) *Geophaps scripta scripta*	Known	Foraging and breeding	293.1	2.7	-	**Figure E.2**
		Foraging	26.7	-	-	
		Dispersal	835.6	33.2	-	
		Potential water source	6.1	0.2	-	
white-throated needletail *Hirundapus caudacutus*	Moderate	Foraging and roosting	181.9	1.6	-	**Figure E.3**
		Dispersal and marginal foraging	2,494.0	140.8	11.3	

Ecological Value	Likelihood of Occurrence	Habitat Utilisation	Area within the Project Area (ha)	Maximum Direct Impact Area (ha) within the Vegetation Clearance Footprint		Figure Reference
				DA2 Area	DA3 Area	
Latham's snipe *Gallinago hardwickii*	Moderate	Foraging and roosting	6.1	0.2	-	**Figure E.7**
MSES Regulated Vegetation						
Remnant vegetation within the defined distance of a watercourse	N/A	N/A	-	-	-	**Figure 4.6**
'Endangered' or 'of concern' prescribed REs	N/A	N/A	-	-	-	**Figure 4.7**
Essential habitat	N/A	N/A	-	-	-	**Figure 4.5**
Connectivity areas	N/A	N/A	-	-	-	**Figure 4.6**
MSES Waterway Barrier Works						
Waterways providing for fish passage	N/A	Low impact waterways	✓	✓	-	**Figure 4.4**
		Moderate impact waterways	✓	✓	✓	
		High impact waterways	✓	✓	-	
		Major impact waterways	✓	✓	-	
MSES Wetlands and Watercourses						
Wetland in a Wetland Protection Area	N/A	N/A	-	-	-	**Figure 4.3**
Other Ecological Values						
fork-tailed swift *Apus pacificus*	Moderate	Foraging and Dispersal	2,675.9	142.4	11.3	**Figure E.8**
oriental cuckoo *Cuculus optatus*	Moderate	Foraging and Dispersal	170.3	1.4	-	**Figure E.9**

Ecological Value	Likelihood of Occurrence	Habitat Utilisation	Area within the Project Area (ha)	Maximum Direct Impact Area (ha) within the Vegetation Clearance Footprint		Figure Reference
				DA2 Area	DA3 Area	
eastern osprey *Pandion haliaetus*	Moderate	Foraging and Dispersal	75.1	1.6	-	**Figure E.10**
grey-headed flying-fox *Pteropus poliocephalus*	Moderate	Foraging	182.7	0.0[7]	-	**Figure E.11**

[7] Rounded down to 0.0 ha

5.1.2 Fauna Injury and Mortality

Physical injury or fatalities to threatened and special least concern species have the potential to occur during all phases of the Project, however the highest likelihood will be during construction activities that involve vegetation clearing, earthworks and trenching. Fauna may be injured or killed during construction principally through:

- Strike from moving vehicles/machinery – a key issue primarily for ground dwelling species, particularly those with poor mobility.
- Entrapment in habitat features during vegetation removal – particularly during tree felling for species that use tree hollows or hollow logs for roosting and denning.
- Entrapment in trenches/excavations – a key issue for ground dwelling species (reptiles and small mammals), particularly those that are active at night and cannot detect trenches to avoid.

The species which are most at risk of injuries and mortality are those that are cryptic, difficult to detect (i.e. harder to locate by fauna spotter-catchers) and/or have poorly developed dispersal mechanisms (i.e. small reptiles). Larger species with defined territories and movement patterns such as the koala are less likely to be at risk of direct mortality where appropriate mitigation measures are applied (i.e. utilising a suitability qualified fauna spotter-catcher to undertake ecological pre-clearance surveys and be present during clearing).

Mobile fauna, such as birds, are likely to relocate away from areas being disturbed and may not be adversely impacted in terms of direct physical trauma, unless fauna are nesting or are injured or killed by vehicle strike during dispersal. However, less mobile fauna, such as ground dwelling reptile and mammal species, nocturnal species that nest or roost in trees or tree hollows during the day (including arboreal mammals), may find it difficult to move away from roosts or active breeding places during construction activities.

Vehicle collision may result in fauna injury or mortality during all phases of the Project, but such risk is greater when high volumes of vehicle activity (including light and heavy vehicles) occur during the construction phase of the Project. The construction of the Project infrastructure, as well as the general use of access tracks and roads across the Vegetation Clearance Footprint will result in increased vehicle movements that may cause injury or death to fauna by vehicle strike. Mammals, reptiles, amphibians and birds are all at risk of vehicle strike, particularly those species that may utilise roads for thermoregulation, movement pathways or as foraging habitat.

In addition, entrapment of wildlife in trenches or other excavations associated with the Project's construction phase may also cause physical trauma to fauna. For example, open trenches for underground utilities are known to trap a wide variety of wildlife and can often result in fauna mortality. Species most likely to become trapped in pits or other excavations during construction of the Project are ground dwelling species that can move across modified areas and arboreal species which descend to the ground to disperse. To mitigate this risk, standard construction protocols and Project-specific management plans (outlined in **Section 6.0**) will be implemented. All open excavations will be inspected daily for trapped fauna, and appropriate escape measures will be installed where trenches or pits are expected to remain open for more than two days. These measures may include trench ladders, ramps, sticks, ropes, and moist hessian sacks at regular intervals to help wildlife escape or survive until they can be safely removed by a suitability qualified fauna spotter-catcher or Project environmental officer.

MSES that are considered likely to be the most susceptible to fauna injury or mortality because of construction activities associated with the Project include the koala, short-beaked echidna and squatter pigeon (southern).The Vegetation Clearance Footprint for DA2 contains potential habitat for all three of these species (mostly dispersal habitat), while the Vegetation Clearance Footprint for DA3 only contains dispersal habitat for the koala and short-beaked echidna.

Management and mitigation measures proposed to reduce fauna impact and mortality through the construction and operation phases of the Project are detailed in **Section 6.1**.

5.1.3 Loss of Fauna Movement Opportunities

The Project design has been refined through an avoidance and minimisation process aimed at reducing impacts on vegetation (including TECs) and habitat for MSES species, leading to a substantial decrease in vegetation and habitat subject to clearing. This approach is anticipated to maintain ecological connectivity for most native fauna within the Project Area by retaining the patches of remnant and regrowth vegetation, as the critical riparian corridors that facilitate movement across the landscape, including the Maxwell Creek riparian corridor.

Despite this, the clearing of up 1.7 ha of remnant and 1.1 ha of regrowth vegetation within the DA2 Area is required for Project construction. Where clearing is required to cross watercourses, some localised restriction to fauna movement and reduced connectivity may still occur. The areas between poles where the transmission line spans are unlikely to limit fauna movement.

Proposed management and mitigation measures including associated management plans are detailed in **Section 6.0**.

5.1.4 Indirect Impacts during Construction

Construction activities required to be undertaken for the Project can potentially result in indirect impacts to MSES, such as:

- Increased edge effects in vegetation communities, reducing the condition of quality of remaining vegetation communities and habitat types.
- The establishment and spread of exotic weed and pest species that may displace native species, reduce or compete for native habitat resources, and alter fire regimes.
- Clearing activities resulting in an increased risk of erosion and sedimentation of waterbodies, reducing water quality and degrading aquatic habitats.
- Increased risk of contamination to land and waterways associated with activities such as vehicle or equipment maintenance, refuelling, or storage of chemicals.
- Changes in hydrology or flood regimes from the installation of infrastructure that may create a barrier to surface flow or increase stormwater run-off and velocities.
- Generation of dust emissions leading to excessive deposition of dust on vegetation suppressing photosynthesis and growth and reducing available foraging resources.
- Increased noise, light and vibration affecting foraging and breeding behaviour for some fauna species or resulting in avoidance and displacement of some species from preferred habitat areas.

It is important to note that during the construction phase the majority of these potential indirect impacts are likely to be short-term and confined to the area under construction at the time. However, it is acknowledged that some of these indirect impacts, such as increased edge effects, may cause longer term impacts.

5.1.4.1 Exacerbation of Pest Fauna and Weeds

The Project Area was found to support a variety of introduced fauna including, feral pig, feral cat, cane toad and European brown hare (*Lepus europaeus**). These species, left unchecked, may flourish in newly disturbed areas, disperse into higher quality habitat areas and further contribute toward the degradation of fauna habitat within the Project Area. Newly cleared linear areas may also act as conduits for pest fauna movement. Additionally, creation of human habitats (camps, offices, that contain rubbish) may attract pest species.

Given the prevalence of these species within the existing landscape, it is unlikely that the proposed works will result in further introductions of feral vertebrate species.

The introduction and/or spread of weeds is an indirect impact that can impact the integrity of remaining vegetation, increase the intensity and/or frequency of fires, as well as threaten the long-term survival of threatened fauna species. Within the Project Area weed species (including pasture grasses) are common within cleared and regrowth vegetation, as well as being frequent throughout the remaining remnant vegetation patches. The weed species that pose the biggest threat to fauna and associated habitat values are the Category 3 'restricted' species listed under the Biosecurity Act, WoNS, as well as high-biomass grass species. High-biomass grass species can out-compete native vegetation as well as reduce the germination of native species. The high biomass of these species also increases the intensity and/or frequency of fires posing a further risk to fauna habitat.

To minimise these impacts best practice weed and pest management will be implemented for the Project as discussed in **Section 6.0**.

5.1.4.2 Edge Effects

Edge effects in ecology are identified as any difference in environment between the edge and interior of a particular vegetation patch (Murcia, 1995). Environmental characteristics which differ across edges cover many components of the environment including atmosphere (e.g. microclimate), vegetation (e.g. structure, composition, functioning), fauna and their habitat and soil (Murcia, 1995).

Edges and their associated ecological effects are often created through vegetation clearing, for example where roads introduce new boundaries within landscapes. The extent of these effects into adjacent vegetation (referred to as edge permeability) is variable and influenced by factors like ecosystem vulnerability, degree of change in land use, intensity of new land use and stochastic events (Murcia, 1995). The main environmental impacts to new edges created by the Project are considered to include:

- Modification of microclimate where new edges are created due to greater penetration of light and wind into the vegetation. Temperature extremes are greater, and humidity of air is generally less at the edge than in the interior of vegetation. This effect is known to increase in size if vegetation is dense or cover is high.
- Physical disturbance to vegetation at the edge. Ongoing damage to the edge of vegetation may occur due to grading and weed control of road edges and vehicle use. Similarly, unsealed tracks with dry vegetation can inadvertently facilitate an increase incident of fire ignitions.
- Changes to soil properties including compaction of the soil, less organic matter and more erodible.
- Introduction of weeds and pathogens through mud and dirt which falls off vehicles.
- Changes to vegetation through the above listed impacts.

Exacerbated edge effects as a result of this Project are likely to be minimal through the strategic positioning the Vegetation Clearance Footprint largely within non remnant areas. Measures to manage potential edge effect impacts are provided in **Section 6.0**.

Exacerbated edge effects are expected to be minimal within the DA3 area, due to the absence of any remnant or regrowth vegetation within the Vegetation Clearance Footprint.

5.1.4.3 Soil Erosion, Sedimentation and Contamination

During the construction phase, both construction areas and their immediate surroundings will be vulnerable to erosion. The increased activity from vehicles, plant machinery, and other equipment will heighten the risk of contamination from spills, such as fuel and oil.

Vegetation removal and soil disturbance during clearing and construction can exacerbate erosion, leading to sediment and nutrient runoff into waterways. This runoff can cause siltation of watercourses, degrade water quality downstream, destabilise beds and banks, and, in extreme cases, collapse riparian vegetation. The loss of topsoil, which exposes subsoil with poor physical and chemical properties, can further degrade the land and water quality.

Increased erosion and sedimentation can impact local waterways and, through downstream transport of sediment and nutrients, contribute to water quality pressures on the GBR, which is protected under the EPBC Act. These contaminants can reduce light availability for corals and seagrasses, promote algal growth, and increase coral susceptibility to bleaching and disease. Potential indirect impacts to the GBR associated with soil erosion, sedimentation and contamination were assessed as part of the Wooderson Solar Farm EPBC Act referral, which was determined to be a **not controlled action**, with impacts to water quality considered negligible and relevant water quality objectives met.

To address these risks, soil erosion, contamination, and sedimentation will be proactively managed through detailed mitigation and management plans, as outlined in **Section 6.0**. These plans will include, but are not limited to, the implementation of effective erosion and sediment control measures including:

- Erosion control measures such as revegetation, cellular confinement, blanketing, mulching, soil binders and mesh matting.
- Drainage control and channelling measures.
- Sediment control techniques such as sediment fencing, basins and grass filter strips.

These measures all aim to protect soil structure, maintain water quality in local waterways, and prevent the flow of contaminants into the GBR. The management plans will be developed during the Project's detailed design to ensure effective, ongoing protection throughout the construction phase.

5.1.4.4 Dust Impacts

Soil exposed through vegetation clearance can lead to dust generation, which in turn may settle on adjacent vegetation. Dust impacts to vegetation are highly variable, but are dependent on the type of vegetation, type of dust (chemical properties, grain size), and total dust load settling on the vegetation.

Dust impacts from the Project are expected to be associated with vegetation directly adjacent to OHTL and switchyard infrastructure during construction, as well as to the access tracks where soil is exposed and can be disturbed through vehicle movement.

Dust is chemically inert, and as such, any potential impacts will be physical in nature, such as blocking of plant stomata and reduction in light penetration to the leaf surface, potentially reducing photosynthetic capacity. This may lead to a reduction in the health and vigour of vegetation directly adjacent to the Vegetation Clearance Footprint.

To reduce this impact, dust will be managed through the construction phase through dust suppression practices (see **Section 6.0**).

5.1.4.5 Increased Risk of Fire

The risk of fire incursion is primarily associated with construction activities, which have the potential to cause injury or loss of human life, damage to flora, fauna, and habitat, and impacts on surface water quality. Key factors that may contribute to an increased fire risk include:

- introduction of ignition sources such as vehicles, machinery, and equipment.
- hot works activities, including welding and grinding.
- introduction or spread of weed species that elevate fuel loads.

The extent, severity, and frequency of fire events will influence whether impacts are short-term or long-term. However, with the implementation of a Project-specific BMP and strict adherence to local bushfire regulations, particularly during the dry season, the overall fire risk is considered low. Further details of the bushfire mitigation measures are provided in **Section 6.0**.

5.1.4.6 Hydrology

Construction activities for the Project involve excavations, stockpiling, and reshaping areas of the landscape, which have the potential to create barriers to surface flow or divert natural flow paths. This could lead to increased runoff and scour in areas where new flow paths are created.

Ground disturbance associated with construction of the Project is largely associated with OHTL pole locations and access tracks. Project design has carefully considered the presence of mapped watercourses and pole locations will avoid these streams to the greatest extent possible to minimise these potential impacts, particularly at the intersection of Doubtful Creek (stream order 3) and Running Creek (stream order 3). Impacted drainage lines and watercourses, as outlined in **Table 5.2**, are mostly confined to stream order 1 watercourses, which are devoid of remnant or regrowth vegetation and are likely to be dry during large portions of the construction period and when under flow conditions, will only support slow flow and low quantities of water.

Mitigation measures that will be adopted to reduce hydrological impacts are described in **Section 6.0**.

5.1.4.7 MSES Susceptible to Indirect Impacts

All MSES are susceptible to the above listed indirect impacts to some degree. However, some are known to be more susceptible than others, and some impacts have been identified as a key threatened process for specific MSES. The susceptibility of the specific MSES values identified or potentially occurring within the Project Area to each direct impact is outlined in **Table 5.2**.

Table 5.2 Risk of Indirect Impacts Associated with the Construction Phase

Indirect Impact	Relevant MSES	Description	Frequency of impact	Duration of impact	Magnitude of impact
Weeds and pest incursion	squatter pigeon (southern)	The squatter pigeon (southern) is a predominantly ground dwelling species. The subspecies is highly susceptible to predation from exotic predators including feral cats and foxes. However, as detailed previously, feral cat population levels in the Project Area are likely to already be high and the Development Footprint has been co-located with cleared areas wherever possible, that may already provide a conduit for pest movement. With the implementation of best practice weed and pest mitigation measures, it is considered unlikely the Project will lead to a notable increase in pest populations.	**Infrequent** Fluctuate seasonally and with land management practices or breaches in general construction protocols (weed washdowns etc.).	**Temporary** Outbreaks addressed via general land management obligations under State laws.	**Localised**, but could extend to the broader Project Area if unmanaged. Magnitude of this impact is considered low given existing habitat is already impacted by weeds and pests.
	koala	Any potential increase in dingo/wild dog populations as a result of the Project could threaten the local koala population. However, as detailed previously, it is considered unlikely the Project will lead to a notable increase in pest populations given the existing population size is likely large.			
	yakka skink	The habitat occupied by yakka skink are susceptible to weed incursion, which may degrade and eventually displace individuals or lead to their mortality. These species are also susceptible to increased predation from exotic predators. With the implementation of best practice weed and pest mitigation measures, it is considered unlikely the Project will lead to a notable increase in weed populations.			

Indirect Impact	Relevant MSES	Description	Frequency of impact	Duration of impact	Magnitude of impact
Elevated dust	Regulated Vegetation - endangered and of concern prescribed REs	Extended periods of dust deposition could threaten the health and viability of prescribed REs within the Project Area (located near the Vegetation Clearance Footprint). The implementation of dust management as deemed necessary and in response to conditions will limit the chances of construction dust having an adverse impact on vegetation.	**Infrequent** Associated with breaches in general construction protocols. Frequency is likely to be higher within the access road corridor due to higher levels of traffic during construction.	**Temporary** Potential impacts rectified through active management or through natural processes such as rainfall.	**Localised**, but could extend to the broader Project Area if unmanaged.
Increased noise and artificial light	Nocturnal MSES	Increased lighting within or adjacent to potential habitat within the Vegetation Clearance Footprint during construction could increase the success of predation by visual predators (including exotic pests) or alter foraging and breeding behaviours. Construction noise or vibration during the day may disturb denning or roosting individuals and negatively affect circadian rhythms.	**Occasional** Minimal night work however noise, light and vibration as a result of construction works have the potential to disrupt fauna species.	**Temporary** Minimal night work, significant excavation work likely required only within a portion of the Vegetation Clearance Footprint and generally limited to tower locations.	**Localised,** Restricted to confined worksite and immediate environs
Fire	All MSES	Changes to fire frequency within the Project Area may result in increased predation and mortality of ground-dwelling individuals, especially those with poor or no mobility. Altered fire regimes may also impact on habitat and lead to degradation.	**Infrequent** Associated with breaches in general construction protocols.	**Temporary** Potential impacts rectified through active management or through natural processes such as rainfall.	**Localised,** but could extend to the broader Project Area if unmanaged.

Indirect Impact	Relevant MSES	Description	Frequency of impact	Duration of impact	Magnitude of impact
		Construction activities are unlikely to significantly alter existing grazing pressures or the implementation of land management practices currently employed by the landholder. Although the increased plant and vehicle presence will result in an increased number of potential ignition sources, employment of standard construction protocols and the implementation of a Bushfire Management Plan (BMP) will ensure the risk of bushfire is actively managed.	Frequency is likely to be higher within the access road corridor due to higher levels of traffic during construction.		
Changes to hydrological regimes, soil erosion and sedimentation	All MSES	Although unlikely, erosion and alteration of riparian zones may lead to the loss of canopy vegetation. These trees may contain important foraging trees, or hollows which are necessary for the breeding of arboreal mammals. Trees may also be important for maintaining shelter and connectivity along the watercourse. The design of the OHTL and erosion risks will be actively managed via the Project's Erosion and Sediment Control Plan (ESCP).	**Infrequent** Fluctuate seasonally and with land management practices or breaches in general construction protocols.	**Temporary** Limited to once off incident or rectified through seasonal inundation diluting to background levels given the ephemeral nature of most waterbodies.	**Localised**, but could extend to the broader Project Area if unmanaged.

5.2 Operation and Maintenance Phase

Potential impacts on MSES associated with the operation phase of the Project are low as activities will be limited to periodic maintenance in the areas previously disturbed during construction. It is expected that these impacts can be managed through the mitigation and management measures provided in **Section 6.0**.

No further vegetation clearing beyond the Vegetation Clearance Footprint will be required as part of the operation and maintenance phase for the Project. Areas directly adjacent to certain infrastructure (i.e. substation), within the 60 m easement below the OHTL, and in areas required for use throughout the life of the Project such as access tracks will require periodic maintenance including grass slashing and re-grading (as applicable) for safe access and operation of infrastructure.

Potential impacts associated with terrestrial fauna, soil contamination and biosecurity will be managed through the implementation of Project management plans discussed in **Section 6.2.1** and species-specific measures, discussed in **Section 6.2.2**.

A key direct risk for some MSES (specifically bird and bat species) during operation is collision with infrastructure and vehicle strike. A detailed discussion on potential impacts on MSES related to collisions and barrier effects is provided below.

5.2.1 Vehicle strike

During operation, risk of vehicle strike will be increased along the access road corridors, particularly during peak times of wildlife activity (i.e. dawn and dusk). Although the frequency of vehicle movements during operations is expected to be minor, there is some risk of vehicle strike to fauna species including medium to large mammals, woodland birds which forage on the ground and reptiles. Of the known and potentially occurring MSES, two are considered vulnerable to vehicle strike: koala and squatter pigeon (southern). To minimise the chances of a collision, speed limits (on access tracks within the Project Area) will be reduced to 40 kilometres per hour (km/hr) or less, as specified in the VFMP.

5.2.2 Collision and/or Entanglement Risk

The grey-headed flying-fox (EPBC Act listed only) and the southern greater glider are highly susceptible to entanglement in barbed-wire fencing, often resulting in severe injuries that lead to death. For the grey-headed flying-fox, these impacts are further intensified when lactating females become entangled, as their dependent young left at the camp do not survive. Barbed-wire fencing is widespread throughout the Project Area, primarily used for stock management on the agricultural properties where the Project is located.

Additional fencing will be required for the Project. However, as outlined in **Table 6.1**, the Project is committed to implementing fauna-sensitive fence design measures including the installation of reflection disc or UV stabilised tape, and the use of plain wire on the top strand of security fencing (where majority of entanglements occur) except where required for security and safety reasons.

5.3 Decommissioning and Rehabilitation Phase

Decommissioning and rehabilitation activities associated with the Project are expected to result in minor and temporary impacts on MSES. These impacts are anticipated to be similar to those associated with the construction phase including similar use of machinery, ground disturbance and vegetation management.

If the solar farm is decommissioned, the OHTL will be decommissioned concurrently at the end of Project life. Decommissioning may involve removal of above-ground infrastructure and, subject to consultation with landholders, removal of subsurface components. Alternatively, it may be agreed with landholders that components may be left in in-situ where this has less impact than ground disturbance to remove the components. Any ground disturbance required will be confined to existing infrastructure footprints and previously disturbed areas, including pole locations and access tracks. Access tracks may also be retained where agreed with landholders and where this represents a lower-impact outcome than full rehabilitation.

The switchyard is expected to remain operational beyond decommissioning of the solar farm and OHTL as a Powerlink Queensland asset. Accordingly, switchyard infrastructure and associated access tracks required for ongoing operation and maintenance will not be decommissioned, and no additional decommissioning-related impacts to MSES are anticipated.

Decommissioning and rehabilitation works may result in temporary and localised increases in noise and potentially dust may occur but will be managed using construction-phase mitigation measures. Traversing vehicles required to complete decommissioning or rehabilitation activities may inadvertently introduce weeds and potentially collide with ground dwelling MSES resulting in injury or mortality.

All impacts to ecological values associated with decommissioning and rehabilitation phase will be addressed in a detailed Decommissioning Management Plan (DMP) that will be developed in consultation with relevant stakeholders prior to decommissioning.

6.0 Avoidance, Mitigation and Management

The avoidance of MSES has been demonstrated through careful selection of the Project Area and the development of the Vegetation Clearance Footprint. Details of site selection and infrastructure layout are provided in **Section 6.1**, while the infrastructure layout was further informed by an ecological constraints assessment outlined in **Section 6.2**.

6.1 Design Approach

6.1.1 Site Selection

The location for the OHTL and switchyard was selected primarily due to proximity to the proposed Calvale to Calliope River 275 kV Transmission Line Reinforcement Project, which Powerlink is developing within its existing transmission easement at this location, enabling a consolidated infrastructure footprint and minimising the need for new disturbance. The route makes use of accessible terrain and areas already highly modified by historical clearing for agriculture. Additionally, existing grazing practices will be able to continue under the extent of the OHTL outside of the solar farm. Additional considerations included constructability, ease of access for construction and maintenance, and the ability to avoid sensitive land uses while maintaining commercial feasibility.

6.1.2 Infrastructure Location

The proposed infrastructure locations for the Project were determined based on careful consideration of environmental constraints, infrastructure constructability requirements, and the opportunity to implement avoidance and minimisation measures to reduce ecological impacts. The inherent characteristics of the Project location supported these efforts, allowing for impacts to be carefully refined and reduced.

A key input to determine the infrastructure layout was the development of an ecological constraints assessment. This assessment aimed to assign a risk category, ranging from "high" to "limited," to identified ecological values based on sensitivity and environmental significance. Guided by ecological and environmental management principles, a mitigation hierarchy was applied according to the assigned risk rating.

Following this assessment, the layout was refined to avoid areas with high and moderate ecological values, resulting in a further reduction of impacts on MSES values (**Figure 6.1**). This resulted in a layout which maximised historically cleared areas and minimised impacts to sensitive areas such as southern greater glider habitat, koala refugia habitat, while completely avoiding patches of Poplar Box TEC.

For example, following the completion of the field survey program and subsequent refinement of ecological constraints mapping, the Proponent undertook a review and redesign process involving the realignment of access tracks and the OHTL and associated infrastructure in the Vegetation Clearance Footprint:

- WSD has continued to refine the Project's infrastructure layout to avoid and minimise direct impacts to vegetated areas, habitat for MSES species and riparian corridors, as much as practicable.
- A minimum vegetation avoidance buffer of 30 m has been applied where possible to minimise potential fragmentation and indirect impacts, particularly for patches of Poplar Box TEC and threatened species habitat.

This outcome reflects a balance between engineering, hydrological, ecological, and landholder considerations associated with the design of the access tracks and OHTL easement at this location. While avoidance was prioritised during the design process, a suite of mitigation and management measures are detailed in **Section 6.2** where ecological impact (direct or indirect) will be unavoidable.

6.1.3 Micro-siting

While Project infrastructure has been determined with careful consideration of environmental, engineering, third-party infrastructure, and landholder constraints, further micro-siting within the Project Area may be necessary based on the location of on-ground constraints, including MSES habitat and waterways. Additional field surveys, including pre-clearance surveys, will be conducted prior to construction. This data will improve the accuracy and detail of mapped terrestrial ecological values within the Vegetation Clearance Footprint and help identify any additional requirements to micro-site Project infrastructure within the Project Area to further minimise impacts on MSES.

Infrastructure micro-siting will aim to avoid or further minimise disturbance (where practicable) to:

- Habitat features required by MSES fauna species including hollow bearing trees and stags, large hollow logs and complex boulder piles.
- Breeding habitat for threatened and migratory fauna species.

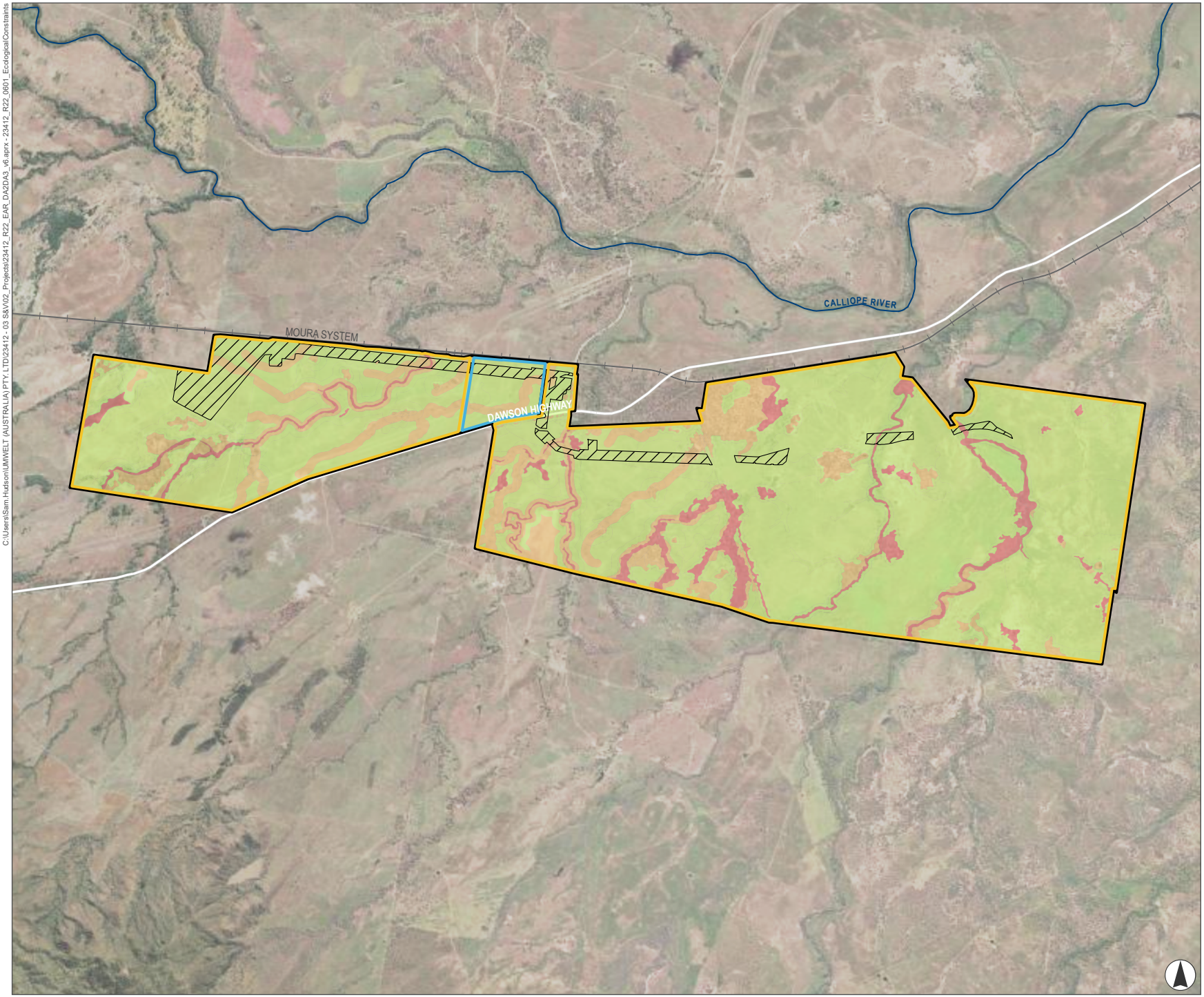


FIGURE 6.1

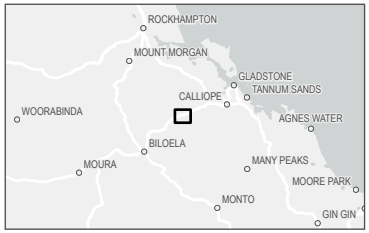
Ecological Constraints Assessment

Legend

- Project Area
- Project Area (DA2)
- Project Area (DA3)
- Vegetation Clearance Footprint (DA2 & DA3)
- Railways
- Major Watercourse
- Major Roads

Constraints Mapping

- High
- Low
- Moderate



0 1 2

Kilometres

Scale 1:63,423 at A4
GDA1994 Zone 56

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6.2 Mitigation and Management Actions

Mitigation and management measures developed for the Project vary in scope and include both general and species-specific measures. These mitigation and management measures have been developed in direct response to the impacts identified in **Section 5.0**, with the intent of reducing any residual impacts to ecological values after the avoidance measures have been implemented. Management plans will be prepared for the Project once the necessary approvals are gained and will include performance criteria and general requirements and/or standard operational controls.

Potential Project impacts on terrestrial ecological values during all phases of the broader Wooderson Solar Farm, including the OHTL and switchyard as applicable, will be managed via Project specific management plans/procedures, including:

- **CEMP:** The CEMP will include actions to limit and reduce the potential impacts on MSES and biodiversity more broadly. The CEMP will be supported by subplans outlining additional control measures such as biosecurity management.
- **OEMP:** The OEMP will outline how the project will be operated to minimise environmental impacts and ensure compliance with relevant requirements.
- **VFMP:** The VFMP will be prepared during detailed design of the Project and include measures specific to the clearing of vegetation and habitat, including no-go zones, approved widths, methods and preparation procedures (will be developed in response to the State approval).
- **BMP:** The BMP will be implemented to minimise the risk of unexpected fire due to Project activities. The BMP should include an assessment of appropriate fire strategies to maintain the ecological values of surrounding vegetation communities.
- **ESCP:** The ESCP will establish a framework for the management of drainage, erosion and sedimentation through the development of the Project's detailed design and subsequent construction and operational phases.
- **SQMP:** A detailed SQMP will be prepared that details quality controls and management measures to treat run off during construction and operation of the Project
- **SMPs:** In accordance with the Nature Conservation (Animals) Regulation 2020, Section 332, states that a person must not tamper with a protected animal's breeding place unless it is part of the SMP approved by the chief executive administering the NC Act (currently DETSI). A SMP is required for disturbance activities where removal or tampering will occur to a breeding place of colonial breeders; special least concern or threatened species. As squatter pigeon (southern) was identified, and suitable breeding habitat for several threatened and least concern species was identified during ecological surveys, it is recommended that a SMP be developed prior to vegetation clearing activities.
- **DMP:** A DMP will be developed and will detail the timing and methodology of removal of the OHTL infrastructure. The DMP will be prepared by the Proponent in collaboration with Project host landholders and submitted to GRC for approval during the detailed design phase.
- **PRP:** The PRP will provide a framework outlining how the rehabilitation will be managed broadly across the Project Area for the life of the Project (i.e. construction until completion of decommissioning).

6.2.1 General Measures

General mitigation and management measures presented below reflect the direct and indirect impacts identified in **Section 5.0**, relevant to terrestrial ecology. All measures captured in this section will be documented in an appropriate Project management plan as stated above.

6.2.1.1 Vegetation and Native Flora Management

General mitigation measures pertaining to native flora and vegetation management are provided below and will be detailed within the VFMP and CEMP that will be prepared for Project. Project mitigation and management measures related to vegetation and native flora include:

- Site preparation must include the demarcation of areas to be cleared as well as 'no-go' zones to avoid inadvertent clearing.
- Micro-siting of Project infrastructure will maximise the use of existing breaks in vegetation and areas of previously cleared land as much as practical.
- Where watercourses intersect linear areas of the Project (i.e. access tracks and OHTL cabling) the clearing width will be reduced wherever it is feasible. The full implementation of this measure is subject to detailed design and safe transport of Project components.
- To minimise further loss of vegetation, trees will be felled away from areas of retained vegetation where practicable. Where trees unavoidably fall into retained areas, they will be left in-situ to mimic natural tree fall and provide habitat for ground-dwelling fauna.
- Dust suppression measures will be implemented as required (i.e. on high wind days during extended dry periods).

6.2.1.2 Native Fauna Management

General mitigation measures pertaining to native fauna are provided below and will be detailed within the VFMP and CEMP that will be prepared for the Project. Project mitigation and management measures related to fauna include:

- A suitability qualified fauna spotter-catcher will be present at all times during clearing.
- Prior to clearing, a suitability qualified fauna spotter-catcher will search for any potential animal breeding places within proposed clearing areas. If located, details on the relevant species or fauna group will be collected as well as the GPS location. Where there is the potential that an active breeding place will be tampered with as part of Project activities, this will only be done in accordance with an approved low-risk and/or high-risk SMP (depending on the species to be impacted).
- In areas of MSES habitat planned to be cleared, a suitability qualified fauna spotter-catcher will scout the area immediately prior to the commencement of disturbance for the presence of habitat trees and other features (i.e. coarse woody debris, hollow logs, large stones and boulder piles), as well as EPBC Act and NC Act listed species. This will include an inspection of terrestrial habitat features (hollows, potential dens, surface rocks and fallen logs) prior to disturbance using inspection cameras, or other methods deemed safe and suitable. Habitat features/trees will be marked using appropriate paint or flagging tape. Where inspection of hollows cannot be safely undertaken prior to felling, the hollow-bearing tree will be 'slow felled' to minimise the likelihood of injury or death and will be inspected by a suitability qualified fauna spotter-catcher to confirm no injured wildlife are present.

- Entrapment of wildlife in trenches or other excavations during the construction phase may cause injury or mortality, particularly for ground-dwelling fauna and arboreal species that descend to the ground to disperse. To mitigate this risk, standard construction protocols and Project-specific management plans will be implemented, including daily inspection of open excavations and the installation of appropriate escape measures where trenches or pits remain open for more than 2 days. Escape measures may include trench ladders, ramps, sticks, ropes, or moist hessian sacks, with trapped fauna to be managed by a suitably qualified fauna spotter-catcher or Project environmental officer.
- Fauna will be preferentially allowed to move off on their own accord. Where this does not occur and immediate relocation is required, as determined by a suitability qualified fauna spotter-catcher, located fauna (excluding koalas, see **Table 6.1**) will be moved to a nearby and suitable undisturbed location in a manner appropriate for the species, or if injured or orphaned, given to a registered wildlife veterinarian or licensed wildlife carer.
- The Code of Practice - Care of sick, Injured or Orphaned Protected Animals in Queensland (Department of Environment, Science and Innovation, 2020) will be used as a guide to inform fauna management strategies.
- Clearing extents will be demarcated to avoid unintentional clearing outside of approved disturbance limits.
- Vegetation clearing will be conducted in a sequential and staged manner to guide fauna towards adjacent habitat and away from hazardous areas. Where possible, this process will include staged habitat removal, starting with the clearing of non-remnant areas first, followed by the clearing of regrowth and remnant areas at least 24 hours later. This approach aims to minimise impacts on fauna by allowing them sufficient time to relocate to safer adjacent habitats.
- Night works within or adjacent to areas of MSES habitat will be avoided where practicable to reduce impacts from construction light and noise on MSES species (i.e. by interrupting male koala mating calls during breeding season). Where night works are required, lights will be directed to minimise light spill into adjacent habitat and the use of alternative, low-noise construction equipment considered.
- The CEMP will detail fauna welfare procedures including operational and compliance reporting procedures for injured and/or dead wildlife. The death of a species listed under the NC Act or EPBC Act will be considered a reportable incident, with DETSI and/or DCCEEW to be notified by the Proponent within a maximum period of 2 business days.
- Where new crossings or improvements to existing tracks are required, the construction methodology will be dependent upon the size of the watercourse and will be in line with the Queensland ADRs for operational work that is constructing or raising waterway barrier works (Department of Agriculture, Fisheries and Forestry, 2025). All watercourse crossings will be the most direct route (i.e. 90 ± 10-degree angle to the watercourse) that maximises the use of existing vegetation breaks and minimises clearing.
- During the construction stage of the Project, machinery and vehicles will remain within the Vegetation Clearance Footprint and will not enter exclusion areas or ‘no-go’ zones. Once operational, light vehicle movement within the Project Area will be via approved access tracks only, except in the event of an emergency. The requirement to enter and traverse the Project Area will be minimised and limited to those required for essential Project activities.

- Signage will be installed which includes information such as wildlife presence (e.g. known squatter pigeon (southern) occurrence areas).

6.2.1.3 Weeds, Pest and Disease Management

Several mitigation and management measures have been developed to minimise the proliferation and/or introduction of introduced weeds and pests. These measures will be managed through the implementation of the biosecurity management measures within the CEMP. The CEMP will define measures, objectives, performance criteria and monitoring activities required for the relevant Project Area.

Biosecurity management measures within the CEMP applicable to weeds and pests include:

- The presence and abundance of weed species, particularly those listed under the Queensland Biosecurity Act 2014 and/or that are WoNS will be surveyed for and identified during pre-clearance ecological field scouts and incorporated within the biosecurity management measures of the CEMP.
- All personnel accessing the Project Area will be made aware of significant weed species (these may be listed species or ones of key concern to landholders) known to the Project Area via toolbox meetings and notices in the common areas of the site office. The Project environment officer may provide informal training on the identification of weed species if necessary.
- Construction activities, including vegetation clearing and soil movement, will work from areas with fewer weed species or smaller infestations towards areas where there is a greater abundance of weeds, where practicable, to minimise potential for spread.
- All equipment and vehicles traversing the site will be subject to an inspection and, if required, a washdown to make sure they are free of organic matter that may contain weed reproductive material.
- Any Project equipment sourced from international origins will be subject to State and Commonwealth quarantine protocols.
- The siting of stockpile areas, spills dumps, refuse areas, and vehicle parking areas will be within areas already cleared or proposed to be cleared to minimise feral animal occurrences.
- Ongoing, routine monitoring will be implemented throughout the life of the Project to ensure early detection of new areas of weed, pathogen and pest spread or incursion, identify previously unrecorded invasive species, and assess the efficacy of prescribed control measures. Specifications of the type and frequency of monitoring and required control measures will be defined in the CEMP.
- Pest populations across the Project Area and surrounds are likely high given the developed nature of the landscape, including mining, urban and agricultural areas. Nonetheless, feral animal control will be conducted by a suitably qualified contractor in accordance with the CEMP, as required and in consultation with the relevant landholders.

6.2.1.4 Other Indirect Impacts

Several mitigation and management measures have been developed to minimise indirect impacts which may arise from the Project. These measures will be managed through the implementation of the proposed management plans (i.e. CEMP, ESCP, SQMP, VFMP, BMP). Project mitigation and management measures relevant to other indirect impacts include:

- An ESCP has been developed and will be updated and finalised during detailed design and implemented during all phases of the Project to minimise sediment-laden runoff leaving the site. The measures included in the ESCP will be progressively updated as construction activities move through the site. The measures included in this ESCP will include:
    - Drainage control measures for drainage channels and unsealed roads.
    - Erosion control measures including cellular confinement systems, compost blankets, gravelling, mulching, hydro mulching and revegetation.
    - Sediment control measures including sediment basins, rock filter dams, check dams, sediment fences and grass filter strips.
- Temporarily disturbed areas will be assessed for ecological and environmental impact and progressively rehabilitated.
- Undertake refuelling and chemical storage in designated containment areas and follow emergency response procedures in the event of a spill. Containment areas will be designed and managed in accordance with relevant regulatory requirements and standard. A Safety Data Sheet (SDS) will be maintained on site at all times and for all chemicals.
- Storage and refuelling areas will be preferentially located away from watercourses, sensitive areas and any source of ignition.
- Threat of bushfire caused by Project activities will be minimised through maintenance of vegetation within the 60 m OHTL easement and firebreaks around ignition sources as appropriate according to the BMP which will be prepared prior to construction.
- In accordance with the BMP, adequate and properly maintained firefighting equipment will be present on site and potential ignition sources controlled.
- Crossings will be designed in accordance with the ADRs (DAF, 2018) to ensure fish passage is not impeded. If this cannot be achieved, a Development Approval will be obtained prior to construction work commencing.
- Construction hours will be restricted to daylight periods where possible. Traffic movements during dawn and dusk periods will be limited.
- Dust suppression measures will be implemented as required i.e. on high wind days (winds above 20 km/hr) during dry periods.
- Speed limit restrictions (40 km/hr) will be enforced on access tracks within the Project Area to minimise potential vehicle strike risk to the species, as specified in the VFMP.
- Lighting considerations will be detailed in the CEMP (e.g. shielded lights on buildings, directing lighting away from habitat).

6.2.2 Species-specific Mitigation Measures

Mitigation and management measures specific to the 'Known' and potentially occurring MSES within the Project Area are detailed in **Table 6.1**. Key threatening processes as detailed in made and/or adopted National Recovery Plans, SPRAT Profiles, Threat Abatement Plans, Approved Conservation Advice or Conservation Listings have been reviewed in order to propose meaningful mitigation and management measures that take into consideration species-specific threats. Measures proposed incorporate industry best practices, statutory or policy basis mitigation and management of MSES, or peer reviewed literature, where available. Greater consideration has been given to MSES values that may be particularly sensitive to potential project impacts including southern greater glider, koala and yakka skink.

Table 6.1 Species-specific Mitigation Measures

Relevant Species	Measures
Squatter pigeon (southern)	
Pre-construction and Construction	• Where clearing is proposed for areas of squatter pigeon (southern) habitat comprising woody vegetation, a suitability qualified fauna spotter-catcher must be present. • Immediately prior to clearing any squatter pigeon (southern) habitat, the fauna spotter-catcher will complete flushing transects to encourage the movement of individuals out of the impact area. • As the squatter pigeon (southern) nests on the ground and is at high risk of direct mortality, potential nests should also be searched for by the fauna spotter-catcher immediately prior to clearing potential breeding or foraging habitat, with any located demarcated. • If direct disturbance to a squatter pigeon (southern) nest is required, this will be managed under an approved SMP (high-risk). An appropriate exclusion zone as determined by the fauna spotter-catcher will be required around active nests. • Where clearing is proposed within or adjacent to a squatter pigeon (southern) water source, active erosion and sediment control measures will be implemented to mitigate potential habitat degradation. • Water extraction activities at any potentially suitable water source for squatter pigeon (southern) will be strictly controlled and monitored to ensure the continuation of the resource. Per waterbody, a single access point will be utilised for water extraction to minimise areas of disturbance and allow potentially occurring individuals to avoid the same area during construction.
All phases	• In the unlikely event of a squatter pigeon (southern) mortality resulting from Project activities, DETSI and/or DCCEEW will be notified within a maximum period of 2 business days. • All requirements within the CEMP will be implemented to minimise the introduction and spread of pest and weed species within areas of habitat. • To minimise the chances of a collision, speed limits (on access tracks within the Project Area) will be reduced to 40 km/hr or less, as specified in the VFMP.
Koala	
Pre-construction and construction	Where clearing is proposed for areas of koala habitat (all utilisation types), a suitably qualified fauna spotter-catcher must be present. Prior to vegetation clearing commencing, the fauna spotter-catcher will include canopy searches for koalas. If a koala is located during the pre-clearance survey or during clearing activities: • The individual must not be forcibly relocated. • Any tree which houses a koala as well as any tree with a crown that overlaps that tree will not be cleared until the koala vacates the tree on its own volition.

Relevant Species	Measures
	• Allow a clearing buffer surrounding the tree, equal to the height of the tree or deemed suitable by the fauna spotter-catcher. • Any injured koala (and fauna in general) should be transported to a registered wildlife veterinarian or licenced wildlife carer. Requirements for koalas subject to handling to be examined and if suspected of Chlamydia infection will be taken to a predesignated registered wildlife veterinarian/wildlife care facility for treatment prior to release. The Project will incorporate koala-safe movement solutions consistent with the design specification outlined in the *Koala-Sensitive Design Guideline* (DETSI, 2022) and *Fauna Sensitive Transport infrastructure Delivery Chapter 12: Species profile – Koalas* (Department of Transport and Main Roads, 2024a) where practical. Specific measures include: • During construction, fencing should be temporarily installed as required around the perimeter of the work area to minimise the haphazard emigration of koalas (and other fauna) into unsafe environments during clearing. The siting of infrastructure has been informed by the location of key wildlife corridors, with clearing in these areas avoided to the greatest extent practicable. This design approach helps to retain essential movement pathways, supporting the ongoing dispersal of fauna between breeding and foraging habitats. The strategic refinements to infrastructure siting (e.g. security fencing) have been incorporated to maintain opportunities for fauna movement across the landscape. • Prior to security fencing being completed, an inspection of trees within the security fencing will be undertaken to ensure no koalas are trapped within the security fencing perimeter. • Clearing must be carried out in a way that ensures any koalas present have time to move out of the clearing site without human intervention. • Where micro-siting opportunities exist, non-juvenile (i.e. DBH > 10 cm) LIKTs will be preferentially retained.
All phases	• All Project fencing installations will be subject to periodic inspection and maintenance to ensure they are fit for purpose and operational. Where koala-exclusion fencing has been installed, inspections must also look for washouts or areas of erosion that may lead to gaps underneath the fencing. • If a koala is sighted within the Project Area, the details of this observation will be communicated via the daily toolbox and on notices in the common areas of the site office in order to increase vigilance in the area and compliance with enforced speed limits. • In the unlikely event of a koala mortality resulting from Project activities, DETSI and/or DCCEEW will be notified within a maximum period of 2 business days. • All requirements within the CEMP will be implemented to minimise the introduction and spread of pest and weed species within areas of habitat.

Relevant Species	Measures
Yakka skink and short-beaked echidna	
Pre-construction and construction	• The Vegetation Clearance Footprint has been designed to avoid all suitable habitat for yakka skink. Site preparation must include the demarcation of areas to be cleared as well as 'no-go' zones to avoid inadvertent clearing. Micro-siting of Project infrastructure will aim to maximise the vegetation avoidance buffers surrounding suitable habitat to limit edge effects. • Within 6 months prior to construction, a suitably qualified ecologist will undertake a targeted survey for yakka skink in all suitable habitat in the Project Area which falls within a 500 m buffer of the Vegetation Clearance Footprint. If an individual or colony is observed, an appropriate exclusion zone will be established, determined by the ecologist or a suitably qualified person. No vegetation clearing or ground disturbance activities would be undertaken within the exclusion zone until next steps are confirmed with DCCEEW. To account for unexpected finds, prior to the clearing of vegetation (i.e. areas mapped outside of suitable habitat), a suitably qualified fauna spotter-catcher will complete ground area (i.e. areas containing coarse woody debris, rocks and logs, decorticating bark and ground litter) inspections. Clearing will only be conducted where required necessary and suitable microhabitat/ shelter features such as large fallen logs will be relocated to areas of adjacent potential habitat. • In the unlikely event that a yakka skink colony is detected, vegetation clearing would only proceed under guidance from DCCEEW and would be managed via a pre-approved High-risk SMP.
All phases	• A yakka skink or short-beaked echidna death resulting from Project related activities will be a reportable incident to the Project Site Manager and DCCEEW and trigger further investigation with regards to causation. Dependent on the outcome of the investigation, the overall significant impact determination for the species may be revised. • All requirements within the CEMP will be implemented to minimise the introduction and spread of pest and weed species within areas of habitat.
Greater glider (southern)	
Pre-construction and construction	• Where clearing is proposed within areas of southern greater glider denning habitat, pre-clearance surveys must include canopy searches and inspections of suitably sized hollows (>8 cm diameter). Where inspection of hollows cannot be safely undertaken prior to felling, the hollow-bearing tree will be 'slow felled' to minimise the likelihood of injury or death and will be inspected by a suitability qualified fauna spotter-catcher to confirm presence or absence of southern greater glider. If an individual is found to be present, it will be inspected for injury and if healthy, relocated to an adjacent area of mapped breeding and denning habitat after dusk. If the individual is injured, it will be transported to a licenced wildlife carer/ registered wildlife veterinarian and rehabilitated prior to releasing in a suitable area adjacent to the location in which it was found. • Exclusion zones will be established around identified active breeding places. Where there is the potential an active breeding place will be tampered with, this will only be done in accordance with an approved and DETSI SMP (high-risk) as per the Nature Conservation (Animals) Regulation 2020.

Relevant Species	Measures
	• Every effort will be made to retain suitable hollow bearing trees (those containing hollows >8 cm diameter) within areas identified as denning habitat. Trees to be retained within the Vegetation Clearance Footprint must be clearly demarcated and avoided. If deemed necessary, a Tree Protection Zone may be established. • Plain wire will be used on the top strand of wire fencing, where the majority of fauna entanglements occur. This mitigation will be implemented throughout the site wherever a barbed top strand is not required for safety (i.e. surrounding high-voltage equipment) or security (i.e. adjacent the site access and public roads where there is high public visibility). In areas where a barbed top strand is required, reflective discs or UV stabilised tape will be installed at 40 cm intervals to minimise the risk of entanglement. Discs should be 100–150 mm in diameter with high-intensity reflectivity with a high colour contrast to background vegetation. In the instance of an entanglement of a live greater glider (southern and central), a suitably qualified wildlife carer will be notified to remove the animal and take it to an appropriately resourced care facility for treatment prior to release if required.
All phases	• In the unlikely event that a southern greater glider is killed as a result of Project activities, DETSI and/or DCCEEW will be notified within a maximum period of 2 business days.
Latham's snipe	
All phases	• The Vegetation Clearance Footprint has been designed to avoid all suitable habitat for the species, including a 40 m exclusion buffer. Water extraction activities will not be undertaken at locations mapped as suitable habitat. • All requirements within the CEMP will be implemented to minimise the introduction and spread of pest and weed species within areas of habitat.
Grey-headed flying-fox	
Construction	• The Project will incorporate grey-headed flying-fox-safe movement solutions and adopt fencing consistent with the design specification outlined in the *Fauna Sensitive Transport Infrastructure Delivery Chapter 10: Species profile – Flying-foxes* (Department of Transport and Main Roads, 2024b). • In the event that a flying-fox congregation is identified within the Vegetation Clearance Footprint, an exclusion zone will be established. A suitably qualified person will refer to the Interim Policy for Determining When a Flying-fox Congregation is Regarding as flying-fox Roost under Section 88C of the *Nature Conservation Act 1992* (Queensland Parks and Wildlife Service, 2021) to determine if the congregation could be considered a roost. If determined that the congregation constitutes a roost, impacts to the flying-fox congregation will be managed in accordance with the *Code of practice – Ecologically Sustainable Management of Flying-fox Roosts* (Department of Environment and Science, 2020b).

Relevant Species	Measures
All phases	• Plain wire will be used on the top strand of wire fencing, where the majority of fauna entanglements occur. This mitigation will be implemented throughout the Vegetation Clearance Footprint wherever a barbed top strand is not required for safety (i.e. surrounding high-voltage equipment) or security (i.e. adjacent the site access and public roads where there is high public visibility). In areas where a barbed top strand is required, reflective discs or UV stabilised tape will be installed at 40 cm intervals to minimise the risk of entanglement. Discs should be 100–150 mm in diameter with high-intensity reflectivity with a high colour contrast to background vegetation. In the instance of an entanglement of a live flying-fox, a suitably qualified bat handler/wildlife carer will be notified to remove the animal and take it to an appropriately resourced care facility for treatment prior to release if required. • A single grey-headed flying-fox death resulting from Project related activities will be a reportable incident to the Project Site Manager and DCCEEW and/or DETSI and trigger further investigation with regards to causation. Dependent on the outcome of the investigation, the overall significant impact determination for the species may be revised.

6.2.2.1 Unexpected Finds Protocol

This section defines an adaptive management response which is to be engaged if unexpected MSES finds are observed during pre-clearance surveys, or any other surveys undertaken prior to construction. In this circumstance, the unexpected finds protocol would be initiated. This protocol involves determining if the individual or population would be impacted by the Project and if so, micro-siting where possible. Where micro-siting is not feasible, a SRI assessment against the Queensland Environmental Offsets Policy - Significant Residual Impact Guideline (Department of State Development, 2014) would be undertaken and engagement with DETSI initiated to determine the next steps. The protocol is detailed below. Whilst the occurrence of new MSES is considered highly unlikely due to the extensive field survey effort that has been conducted, the intent of this protocol is to ensure the appropriate adaptive management response is implemented and adverse impacts are mitigated should they be discovered.

STEP 1: Halt construction/clearing activities in the area (i.e. adjacent areas within the Vegetation Clearance Footprint where suitable habitat is present. This will be determined by a suitably qualified ecologist or fauna spotter catcher).

STEP 2: Undertake investigation into potential impacts on the species. This should include:

- Updating of habitat mapping.
- Updating of SRI assessment and/or Significant Impact Assessment.
- Determination of avoidance and mitigation strategies.

STEP 3: Communicate outcomes with DETSI and determine next steps.

7.0 Significant Residual Impacts

As described in **Section 4.6**, Two MSES values are mapped within the Vegetation Clearance Footprint: waterways for waterway barrier works and protected wildlife habitat.

The Queensland Government has produced the Queensland Environmental Offsets Policy - Significant Residual Impact Guideline (Department of State Development, Infrastructure and Planning, 2014) to assist in determining whether a project will result in a SRI. SRIs to MSES are likely to require environmental offsets in accordance with the Queensland EO Act.

MSES Waterway Barrier Works and MSES Protected Wildlife Habitat are described in **Section 7.1** and **Section 7.2** respectively.

7.1 MSES Waterway Barrier Works

Under the Fisheries Act, any operational works within a mapped waterway for waterway barrier works may require assessment under the Planning Act if the proposed development temporarily or permanently restricts fish access and movement along the waterway. Where required, any proposed waterway barrier works as part of the Project will be designed in accordance with the ADR (Department of Agriculture, Fisheries and Forestry, 2025). Consequently, an SRI assessment is not required.

Where waterway barrier works do not comply with the ADR a development permit for operational work that is waterway barrier works will be obtained as part of a separate development application. SRIs will be assessed as part of the separate development application, where required.

7.2 MSES Protected Wildlife Habitat

The Project will intersect protected wildlife habitat (squatter pigeon (southern) (*Geophaps scripta scripta*); koala (*Phascolarctos cinereus*); white-throated needletail (*Hirundapus caudacutus*); southern greater glider (*Petauroides volans volans*); short-beaked echidna (*Tachyglossus aculeatus*) and Latham's snipe (*Gallinago hardwickii*)).

The Project has undergone an iterative design process to minimise adverse impacts to MSES to the greatest possible extent. An environmental offset is not required for the Project under the EO Act, with respect to protected wildlife habitat, given that the Project is not a prescribed activity under schedule 1 of the EO Regulation for the following reasons:

- The Project does not require an assessment against the State codes listed in schedule 1, section 7 of the EO Regulation.
- There are no known impacts on Matters of Local Environmental Significance.
- The Project will not involve taking a protected plant within the meaning of the NC Act.

Threatened species listed under both the EPBC Act and NC Act (which includes all the species listed above, except for the short-beaked echidna) have been separately assessed under the EPBC Act Offsets Policy and formed part of the separate Wooderson Solar Farm EPBC Act referral. Assessment determined the Project to be a **not controlled action**, and no offsets are required under the EPBC Act.

8.0 Conclusion and Recommendations

Umwelt was engaged by WSD to investigate terrestrial ecological matters requiring consideration with development and approvals for the Project under the relevant planning frameworks applicable to this DA, including MSES prescribed under State legislation. Terrestrial ecological values within the Project Area were investigated by means of a comprehensive desktop assessment and field surveys conducted by Umwelt ecologists between 2021 and 2024.

- A total of 243 flora species were identified during the field survey. No threatened flora species were identified during the field survey and are considered likely to occur within the Project Area.
- A total of 92 fauna species were identified within the Project Area throughout the field surveys comprising of 58 birds, 26 mammals, four reptiles and four amphibian species and includes introduced species.
- One listed fauna species was observed during field surveys: squatter pigeon (southern) (*Geophaps scripta scripta*), seen within the DA2 Area. In addition, the following NC Act threatened, or special least concern fauna species have a 'High' or 'Moderate' likelihood of occurrence:
    - 'High':
        - short-beaked echidna (Special Least Concern (non-migratory) under the NC Act).
    - 'Moderate':
        - koala (Endangered under the NC Act)
        - southern greater glider (Endangered under the NC Act)
        - yakka skink (Vulnerable under the NC Act)
        - white-throated needletail (Vulnerable under the NC Act)
        - fork-tailed swift (Special Least Concern (migratory) under the NC Act)
        - Latham's snipe (Vulnerable under the NC Act)
        - oriental cuckoo (Special Least Concern (migratory) under the NC Act), and
        - eastern osprey (Special Least Concern (migratory) under the NC Act).
- The overall Project Area is predominantly mapped as Category X vegetation but also includes 18.7 ha of Category C vegetation and 256.6 ha of Category R vegetation.
- Ground-truthed RE mapping within the Project Area identified a total of 243.3 ha of remnant and 76.6 ha of regrowth REs.

Key results relevant to DA2:

- The Vegetation Clearance Footprint within the DA2 Area contains no Category B or C vegetation, but includes:
    - **18.2 ha of Category R vegetation**.
    - **124.1 ha of Category X vegetation.**

- Clearing will be further minimised through detailed design and will be undertaken as either exempt clearing or under the ADVCC, by either complying with the clearing limits or providing exchange areas as required.
- There is no State-mapped prescribed REs containing remnant vegetation (MSES Regulated Vegetation) mapped within the Project Area or Vegetation Clearance Footprint.
- Ground-truthed RE mapping within the Project Area identified a total of 243.3 ha of remnant and 76.6 ha of regrowth REs, comprising of the following REs under the VM Act:
    - One Endangered (RE 11.12.17).
    - Four 'Of Concern' (REs 11.3.4a, 11.3.4, 11.3.2 and 11.12.3).
    - Three 'Least Concern' (REs 11.12.1, 11.3.25d and 11.3.25b).
- Seven fauna habitat types were recorded within the DA2 Area.
- Two MSES were identified within the DA2 Vegetation Clearance Footprint: Waterways for Waterway Barrier Works and Protected Wildlife Habitat for six conservation significant fauna species (refer to **Section 4.6**). These MSES are not prescribed environmental matters under State code 16 and are therefore exempt from Significant Residual Impact assessment for this Project. Habitat for conservation significant species occur as non-remnant areas or as small fragments that are already disturbed by historical clearing, exotic weeds and cattle grazing.

Key findings relevant to DA3:

- The Vegetation Clearance Footprint within the DA3 Area contains no Category B or C vegetation, but includes:
    - **0.5 ha of Category R vegetation.**
    - **10.8 ha of Category X vegetation.**
- Clearing will either be undertaken as exempt clearing or under the ADVCC, either complying with the clearing limits or providing an exchange area for the relevant clearing areas.
- There is no State-mapped prescribed REs containing remnant vegetation (MSES Regulated Vegetation) mapped within the Project Area or Vegetation Clearance Footprint for DA3.
- Ground-truthed RE mapping identified no remnant or regrowth REs within the Project Area or Vegetation Clearance Footprint for DA3, verifying the entire DA3 section as non-remnant.
- Two fauna habitat types were identified within the DA3 Area.
- Two MSES were identified within the DA3 Vegetation Clearance Footprint: Waterways for Waterway Barrier Works and Protected Wildlife Habitat for three conservation significant fauna species (refer to **Section 4.6**). These MSES are not prescribed environmental matters under State code 16 and are therefore exempt from Significant Residual Impact assessment for this Project. Habitat for conservation significant species occur as non-remnant areas or as small fragments that are already disturbed by historical clearing, exotic weeds and cattle grazing.

The assessment identifies several potential impacts and mitigation measures associated with the Project, with the key construction impact being vegetation loss due to clearing. The greatest risk to ecological values arises during the construction phase due to habitat loss, which directly affects vegetation, flora, and fauna. Additional potential impacts include reduced opportunities for fauna movement, heightened biosecurity risks, increased risk of erosion and sedimentation of waterbodies and indirect disturbances such as noise, light, and dust.

The Project has employed avoidance controls as part of the current site selection and Vegetation Clearence Footprint design, specifically in riparian areas which are natural corridors for fauna movement and refuge. As the Project progresses into detailed design and construction, ecological constraints will continue to be considered with any options to avoid or reduce impacts investigated. Additionally, pre-clearance surveys will be undertaken within appropriate habitat for the threatened species 'Known' and likely to occur within the Vegetation Clearence Footprint. If additional threatened species are located during pre-clearance surveys, efforts will be made to avoid or minimise impacts through the micro-siting process. If these threatened species cannot be avoided, then a species-specific SMP will be prepared and approved prior to construction and/or clearing activities.

Where avoidance is not possible, the Project will be governed by a suite of management plans, which will outline procedures to limit and reduce impacts on vegetation, flora and fauna. These management plans include:

- A CEMP.
- An OEMP.
- A VFMP.
- An ESCP.
- An SQMP.
- A DMP.
- A PRP.
- A BMP.
- Any species-specific SMPs.

Within the Vegetation Clearance Footprint, 2 MSES values were identified, which are Waterways for Waterway Barrier Works and Protected Wildlife Habitat for 7 conservation significant fauna species.

A SRI assessment is not required for Protected Wildlife Habitat under the EO Act and Regulation because the Project is not a prescribed activity. It does not trigger assessment against the State codes in schedule 1, section 7, does not impact Matters of Local Environmental Significance, and does not involve taking a protected plant under the NC Act.

Any waterway crossings required for the Project will be designed in accordance with the ADR and as such an SRI assessment of impacts is not required at this time. Where waterway barrier works do not comply with the ADR a development permit for operational work that is waterway barrier works will be obtained as part of a separate development application. SRIs will be assessed as part of the separate development application, where required.

Offsets under the EO Act are therefore unlikely to be required to obtain the development permit for a material change of use for a major electricity infrastructure for either DA2 or DA3. Threatened species listed under both the EPBC Act and NC Act were considered as part of the separate Wooderson Solar Farm EPBC Act referral, which determined the Project to be a **not controlled action**, with no offset required under the EPBC Act.

The potential impacts on ecological values including threatened species habitat have been appropriately considered through the Project design and will be further minimised and mitigated throughout the construction and operational phases. Considering the above information presented in this ecological assessment, the Project demonstrates compliance with the performance outcomes, and therefore the purpose of the biodiversity overlay code of the Planning Scheme.

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Appendix A

Desktop Assessment Results



Queensland Government

Department of the Environment, Tourism, Science and Innovation

Environmental Reports

Matters of State Environmental Significance

For the selected area of interest

Custom input

Environmental Reports - General Information

The Environmental Reports portal provides for the assessment of selected matters of interest relevant to a user specified location, or area of interest (AOI). All area and derivative figures are relevant to the extent of matters of interest contained within the AOI unless otherwise stated. Please note, if a user selects an AOI via the "central coordinates" option, the resulting assessment area encompasses an area extending for a 2km radius from the point of interest.

All area and area derived figures included in this report have been calculated via reprojecting relevant spatial features to Albers equal-area conic projection (central meridian = 146, datum Geocentric Datum of Australia 2020). As a result, area figures may differ slightly if calculated for the same features using a different co-ordinate system.

Figures in tables may be affected by rounding.

The matters of interest reported on in this document are based upon available state mapped datasets. Where the report indicates that a matter of interest is not present within the AOI (e.g. where area related calculations are equal to zero, or no values are listed), this may be due either to the fact that state mapping has not been undertaken for the AOI, that state mapping is incomplete for the AOI, or that no values have been identified within the site.

The information presented in this report should be considered as a guide only and a field survey may be required to validate values on the ground.

Please direct queries about these reports to: Planning.Support@detsi.qld.gov.au

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Table of Contents

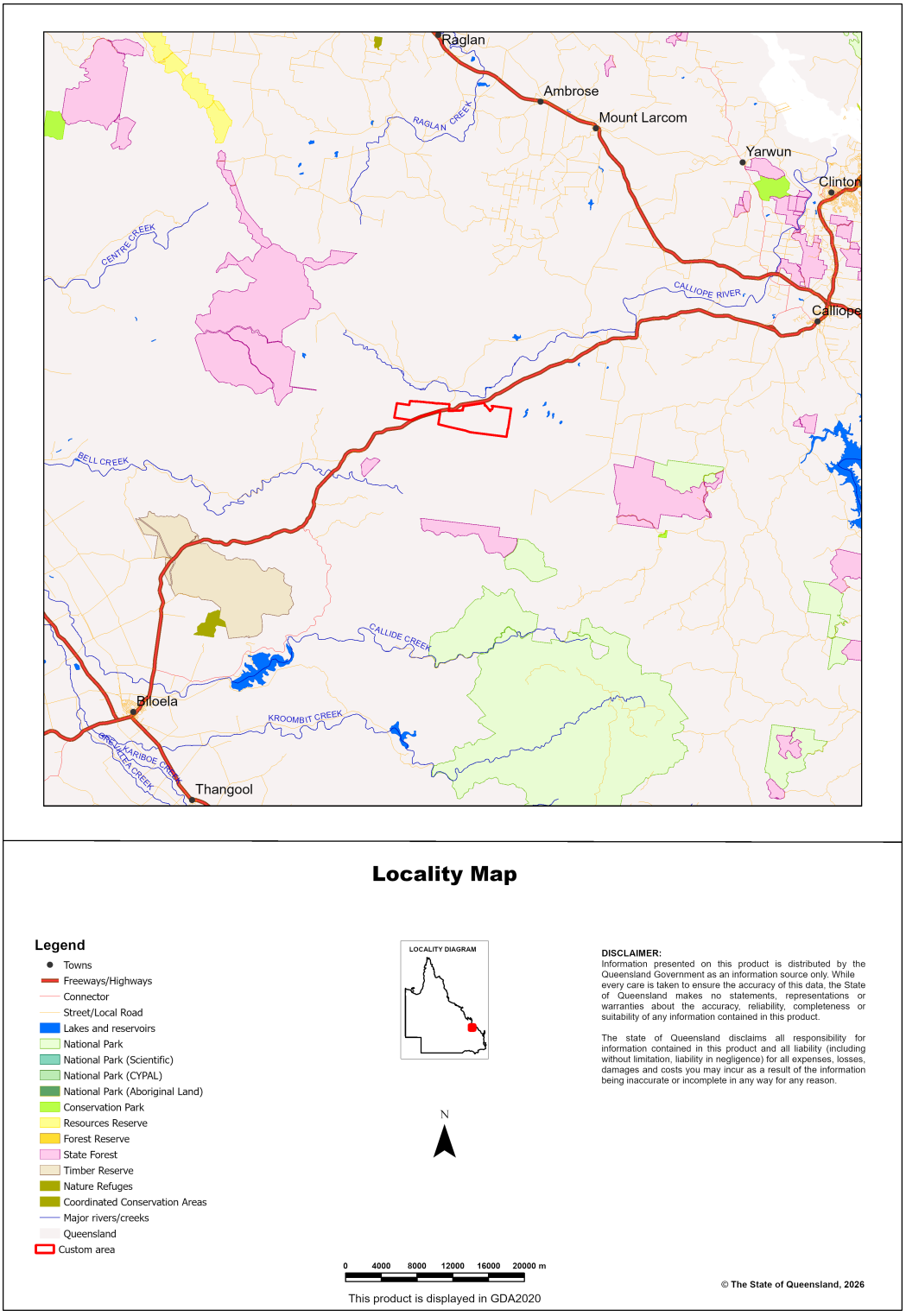
Assessment Area Details 4
Matters of State Environmental Significance (MSES) 5
MSES Categories 5
MSES Values Present 6
Additional Information with Respect to MSES Values Present 6
MSES - State Conservation Areas 6
MSES - Wetlands and Waterways 7
MSES - Species 7
MSES - Regulated Vegetation 10
MSES - Offsets 11
Maps 12
Map 1 - MSES - State Conservation Areas 12
Map 2 - MSES - Wetlands and Waterways 13
Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals 14
Map 3b - MSES - Species - Koala habitat area (SEQ) 15
Map 3c - MSES - Species - Wildlife habitat (sea turtle nesting areas) 16
Map 4 - MSES - Regulated Vegetation 17
Map 5 - MSES - Offset Areas 18
Appendices 19
Appendix 1 - Matters of State Environmental Significance (MSES) methodology 19
Appendix 2 - Source Data 20
Appendix 3 - Acronyms and Abbreviations 21

Assessment Area Details

The following table provides an overview of the area of interest (AOI) with respect to selected topographic and environmental values.

Table 1: Summary table, details for AOI: Custom input, with area 2675.91 ha

Local Government(s)	Catchment(s)	Bioregion(s)	Subregion(s)
Gladstone Regional	Calliope	Brigalow Belt	Mount Morgan Ranges



Matters of State Environmental Significance (MSES)

MSES Categories

Queensland's State Planning Policy (SPP) includes a biodiversity State interest that states:

'The sustainable, long-term conservation of biodiversity is supported. Significant impacts on matters of national or state environmental significance are avoided, or where this cannot be reasonably achieved; impacts are minimised and residual impacts offset.'

The MSES mapping product is a guide to assist implementation of the SPP biodiversity policy. While it supports the SPP, the mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations.

The SPP defines matters of state environmental significance as:

- Protected areas (including all classes of protected area except coordinated conservation areas) under the *Nature Conservation Act 1992;*

- Marine parks and land within a 'marine national park', 'conservation park', 'scientific research', 'preservation' or 'buffer' zone under the Marine Parks Act 2004 ;

- Areas within declared fish habitat areas that are management A areas or management B areas under the Fisheries Regulation 2008;

- *Threatened wildlife under the Nature Conservation Act 1992* and special least concern animals under the Nature Conservation (Wildlife) Regulation 2006;

- Regulated vegetation under the *Vegetation Management Act 1999* that is:

  - Category B areas on the regulated vegetation management map, that are 'endangered' or 'of concern' regional ecosystems;
  - Category C areas on the regulated vegetation management map that are 'endangered' or 'of concern' regional ecosystems;
  - Category R areas on the regulated vegetation management map;
  - Regional ecosystems that intersect with watercourses identified on the vegetation management watercourse and drainage feature map;
  - Regional ecosystems that intersect with wetlands identified on the vegetation management wetlands map;

- Strategic Environmental Areas under the *Regional Planning Interests Act 2014* ;

- Wetlands in a wetland protection area of wetlands of high ecological significance shown on the Map of Queensland Wetland Environmental Values under the Environment Protection Regulation 2019;

- Wetlands and watercourses in high ecological value waters defined in the Environmental Protection (Water) Policy 2009, schedule 2;
- Legally secured offset areas.

MSES Values Present

The MSES values that are present in the area of interest are summarised in the table below:

Table 2: Summary of MSES present within the AOI

1a Protected Areas- estates	0 ha	0.0%
1b Protected Areas- nature refuges	0 ha	0.0%
1c Protected Areas- special wildlife reserves	0 ha	0.0%
2 State Marine Parks- highly protected zones	0 ha	0.0%
3 Fish habitat areas (A and B areas)	0 ha	0.0%
4 Strategic Environmental Areas (SEA)	0 ha	0.0%
5 High Ecological Significance wetlands on the Map of Queensland Wetland Environmental Values	0 ha	0.0%
6a High Ecological Value (HEV) wetlands	0 ha	
6b High Ecological Value (HEV) waterways	0 km	Not applicable
7a Threatened (endangered or vulnerable) wildlife	2.3 ha	0.1%
7b Special least concern animals	0 ha	0.0%
7c i Koala habitat area - core (SEQ)	0 ha	0.0%
7c ii Koala habitat area - locally refined (SEQ)	0 ha	0.0%
7d Sea turtle nesting areas	0 km	Not applicable
8a Regulated Vegetation - Endangered/Of concern in Category B (remnant)	0.01 ha	0.0%
8b Regulated Vegetation - Endangered/Of concern in Category C (regrowth)	42.08 ha	1.6%
8c Regulated Vegetation - Category R (GBR riverine regrowth)	256.61 ha	9.6%
8d Regulated Vegetation - Essential habitat	0 ha	0.0%
8e Regulated Vegetation - intersecting a watercourse	72.3 km	Not applicable
8f Regulated Vegetation - within 100m of a Vegetation Management Wetland	0 ha	0.0%
9a Legally secured offset areas- offset register areas	0 ha	0.0%
9b Legally secured offset areas- vegetation offsets through a Property Map of Assessable Vegetation	0 ha	0.0%

Additional Information with Respect to MSES Values Present

MSES - State Conservation Areas

1a. Protected Areas - estates

(No results)

1b. Protected Areas - nature refuges

(No results)

1c. Protected Areas - special wildlife reserves

(No results)

2. State Marine Parks - highly protected zones

(No results)

3. Fish habitat areas (A and B areas)

(No results)

Refer to **Map 1 - MSES - State Conservation Areas** for an overview of the relevant MSES.

MSES - Wetlands and Waterways

4. Strategic Environmental Areas (SEA)

(No results)

5. High Ecological Significance wetlands on the Map of Queensland Wetland Environmental Values

(no results)

6a. Wetlands in High Ecological Value (HEV) waters

(no results)

6b. Waterways in High Ecological Value (HEV) waters

(no results)

Refer to **Map 2 - MSES - Wetlands and Waterways** for an overview of the relevant MSES.

MSES - Species

7a. Threatened (endangered or vulnerable) wildlife

Values are present

7b. Special least concern animals

Not applicable

7c i. Koala habitat area - core (SEQ)

Not applicable

7c ii. Koala habitat area - locally refined (SEQ)

Not applicable

7d. Wildlife habitat (sea turtle nesting areas)

Not applicable

Threatened (endangered or vulnerable) wildlife habitat suitability models

Species	Common name	NCA status	Presence
Boronia keysii	Keys boronia	V	None
Calyptorhynchus lathami	Glossy black cockatoo	V	None
Casuarius casuarius johnsonii	Sthn population cassowary	E	None
Crinia tinnula	Wallum froglet	V	None
Denisonia maculata	Ornamental snake	V	None
Euastacus bindal	Mount Elliot crayfish	CR	None
Euastacus binzayedi		CR	None
Euastacus eungella		E	None
Euastacus hystricosus		E	None
Euastacus jagara	Jagara hairy crayfish	CR	None
Euastacus maidae		CR	None
Euastacus monteithorum		E	None
Euastacus robertsi		E	None
Taudactylus pleione	Kroombit tinkerfrog	E	None
Litoria freycineti	Wallum rocketfrog	V	None
Litoria olongburensis	Wallum sedgefrog	V	None
Macadamia integrifolia		V	None
Melaleuca irbyana	swamp tea-tree	E	None
Macadamia ternifolia		V	None
Macadamia tetraphylla	bopple nut	V	None
Petrogale penicillata	brush-tailed rock-wallaby	V	None
Petrogale coenensis	Cape York rock-wallaby	E	None
Petrogale purpureicollis	purple-necked rock-wallaby	V	None
Petrogale sharmani	Sharmans rock-wallaby	V	None
Petrogale xanthopus celeris	yellow-footed rock-wallaby (Qld subspecies)	V	None
Petaurus gracilis	Mahogany Glider	E	None
Petrogale persephone	Proserpine rock-wallaby	E	None
Phascolarctos cinereus	Koala - outside SEQ*	E	None
Pezoporus wallicus wallicus	Eastern ground parrot	V	None
Xeromys myoides	Water Mouse	V	None

*For koala model, this includes areas outside SEQ. Check 7c SEQ koala habitat for presence/absence.

Threatened (endangered or vulnerable) wildlife species records

Scientific name	Common name	NCA status	EPBC status	Migratory status
Geophaps scripta scripta	squatter pigeon (southern subspecies)	V	V	None
Phascolarctos cinereus	koala	E	E	None

Special least concern animal species records

(No results)

Shorebird habitat (critically endangered/endangered/vulnerable)

Not applicable

Shorebird habitat (special least concern)

Not applicable

**Nature Conservation Act 1992 (NCA) Status- Endangered (E), Vulnerable (V) or Special Least Concern Animal (SL). Environment Protection and Biodiversity Conservation Act 1999 (EPBC) status: Critically Endangered (CE) Endangered (E), Vulnerable (V)*

Migratory status (M) - China and Australia Migratory Bird Agreement (C), Japan and Australia Migratory Bird Agreement (J), Republic of Korea and Australia Migratory Bird Agreement (R), Bonn Migratory Convention (B), Eastern Flyway (E)

To request a species list for an area, or search for a species profile, access Wildlife Online at:

https://www.qld.gov.au/environment/plants-animals/species-list/

Refer to **Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals** and **Map 3b - MSES - Species - Koala habitat area (SEQ)** and **Map 3c - MSES - Wildlife habitat (sea turtle nesting areas)** for an overview of the relevant MSES.

MSES - Regulated Vegetation

For further information relating to regional ecosystems in general, go to:

https://www.qld.gov.au/environment/plants-animals/plants/ecosystems/

For a more detailed description of a particular regional ecosystem, access the regional ecosystem search page at:

https://environment.ehp.qld.gov.au/regional-ecosystems/

8a. Regulated Vegetation - Endangered/Of concern in Category B (remnant)

Regional ecosystem	Vegetation management polygon	Vegetation management status
11.12.17/11.3.4/11.12.1	E-dom	rem_end

8b. Regulated Vegetation - Endangered/Of concern in Category C (regrowth)

Regional ecosystem	Vegetation management polygon	Vegetation management status
11.12.17/11.3.4/11.12.1	E-dom	hvr_end
11.12.17/11.3.4/11.3.26	E-dom	hvr_end

8c. Regulated Vegetation - Category R (GBR riverine regrowth)

Regulated vegetation map category	Map number
R	9049

8d. Regulated Vegetation - Essential habitat

Not applicable

8e. Regulated Vegetation - intersecting a watercourse**

A vegetation management watercourse is mapped as present

8f. Regulated Vegetation - within 100m of a Vegetation Management wetland

Not applicable

Refer to **Map 4 - MSES - Regulated Vegetation** for an overview of the relevant MSES.

MSES - Offsets

9a. Legally secured offset areas - offset register areas

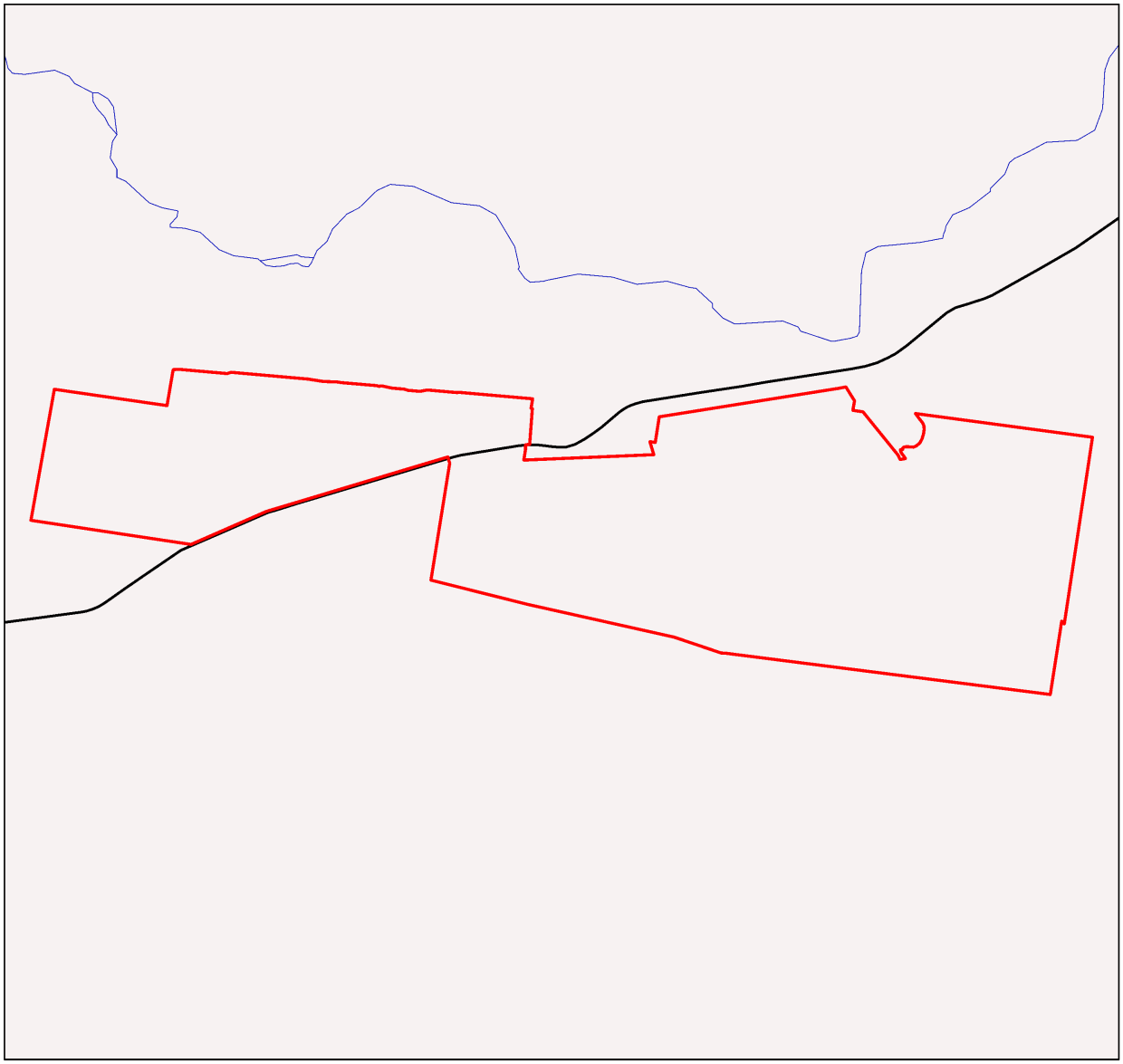
(No results)

9b. Legally secured offset areas - vegetation offsets through a Property Map of Assessable Vegetation

(No results)

Refer to **Map 5 - MSES - Offset Areas** for an overview of the relevant MSES.

Map 1 - MSES - State Conservation Areas



MSES - State Conservation Areas

- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Protected area (estates, nature refuges, special wildlife reserves)
- Declared fish habitat area (A and B areas)
- Marine park (highly protected)
- Custom area



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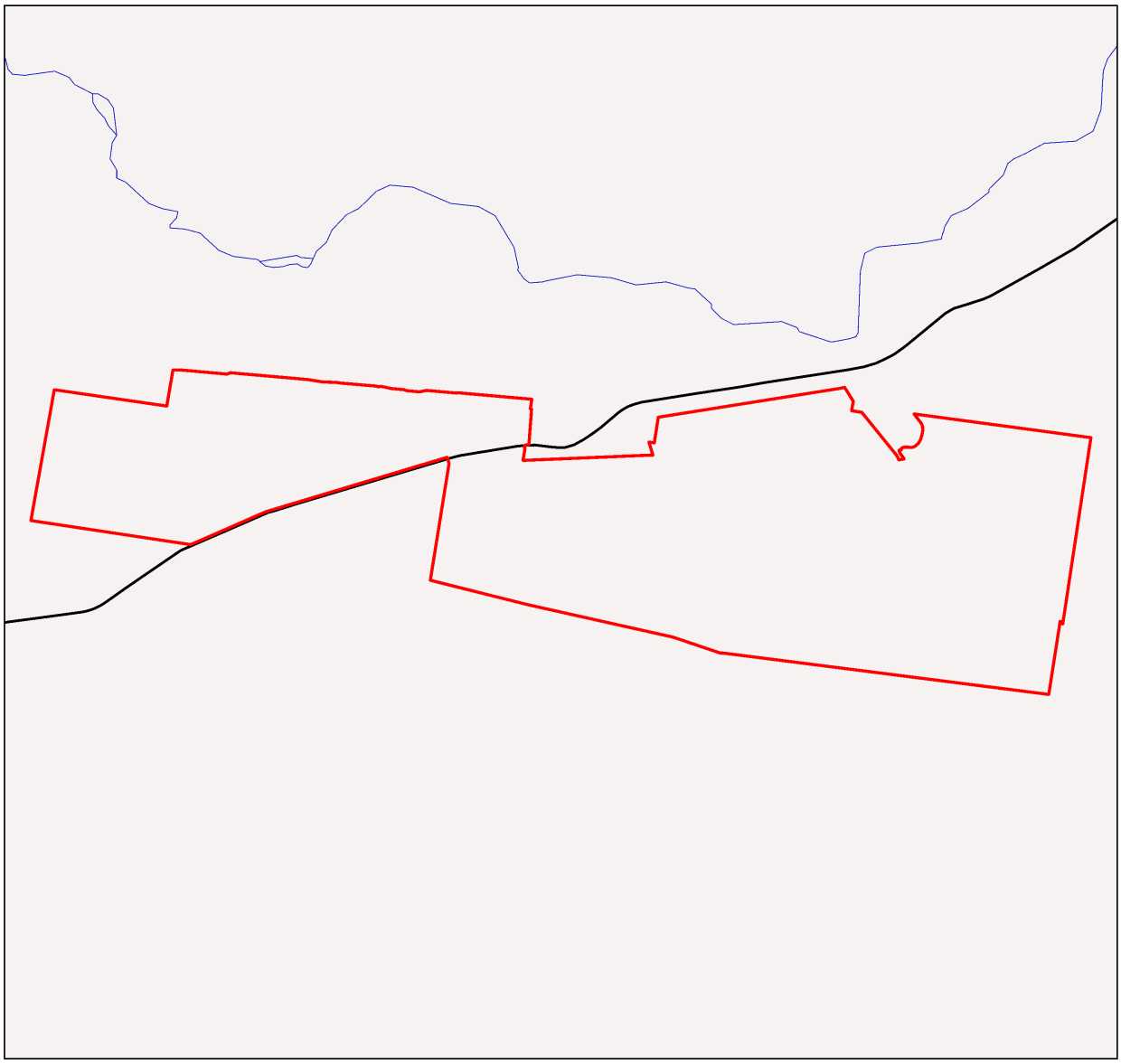
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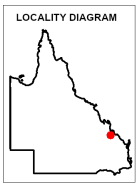
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Map 2 - MSES - Wetlands and Waterways



MSES - Wetlands and Waterways

- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Declared high ecological value waters (watercourse)
- Strategic environmental area (designated precinct)
- Declared high ecological value waters (wetland)
- High ecological significance wetlands
- Custom area



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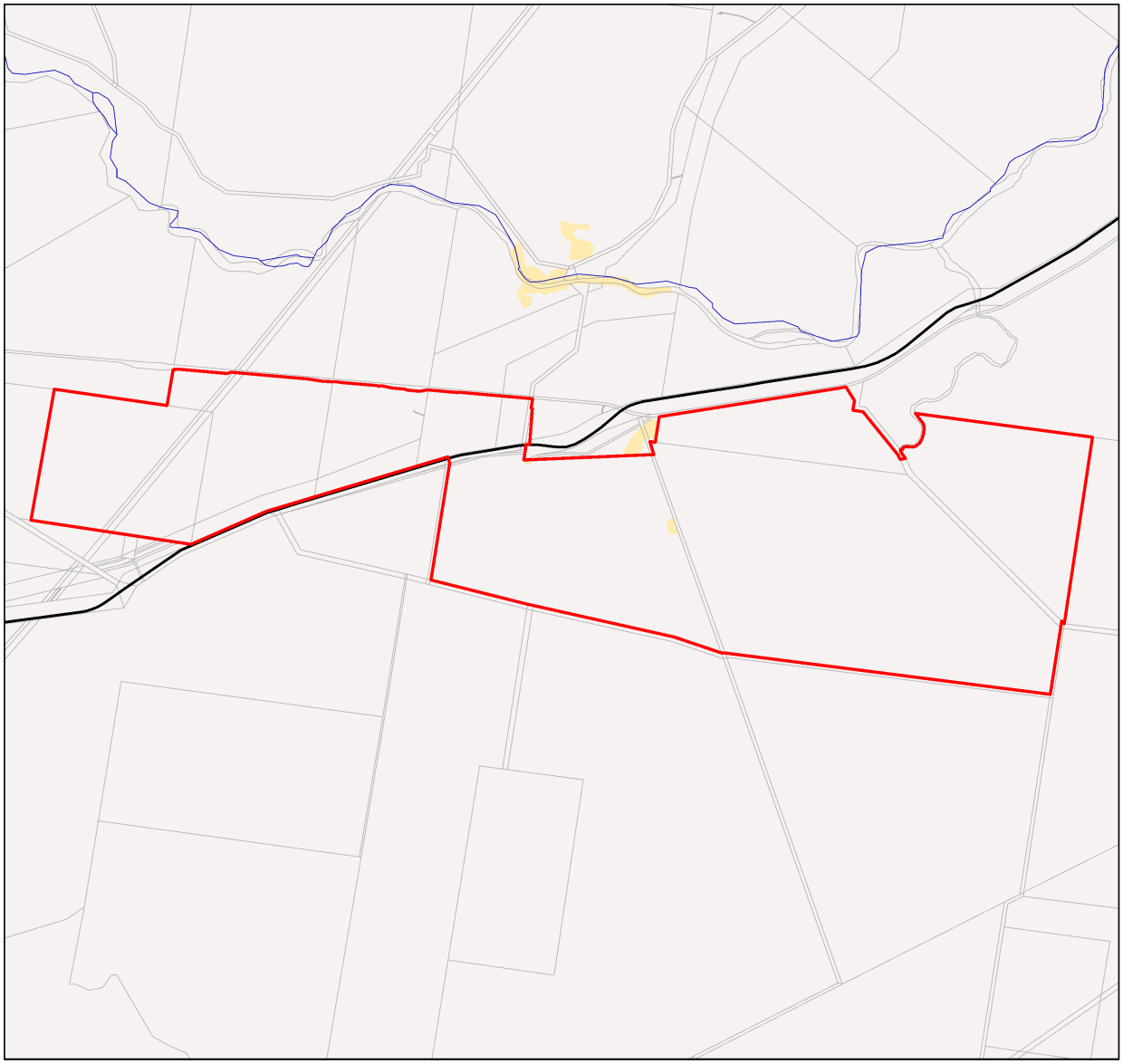
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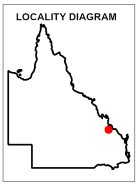
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Map 3a - MSES - Species - Threatened (endangered or vulnerable) wildlife and special least concern animals



MSES - Species
Threatened (endangered or vulnerable) wildlife and special least concern animals

- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Wildlife habitat (special least concern)
- Wildlife habitat (endangered or vulnerable)
- Custom area



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Map 3b - MSES - Species - Koala habitat area (SEQ)



MSES - Species
Koala habitat area (SEQ)

- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Koala habitat area (core)
- Koala habitat area (locally refined)
- Custom area

LOCALITY DIAGRAM



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The represented layers for SEQ 'koala habitat area-core' and 'koala habitat area- locally refined' in MSES are sourced directly from the regulatory mapping under the Nature Conservation (Koala) Conservation Plan 2017. Whilst every effort is made to ensure the information remains current, there may be delays between updating versions. Please refer to the original mapping for the most recent version. See https://environment.des.qld.gov.au/wildlife/animals/living-with/koalas/mapping

The koala habitat mapping within South East Queensland uses regional ecosystem linework compiled at a scale varying from 1:25,000 to 1:100,000. Linework should be used as a guide only. The positional accuracy of regional ecosystem data mapped at a scale of 1:100,000 is +/- 100 metres.

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0 710 1,420 2,130 2,840 3,550 m

This product is displayed in GDA2020

Map 3c - MSES - Species - Wildlife habitat (sea turtle nesting areas)



MSES - Wildlife habitat (sea turtle nesting areas)

- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Wildlife habitat (sea turtle nesting areas)
- Custom area

LOCALITY DIAGRAM



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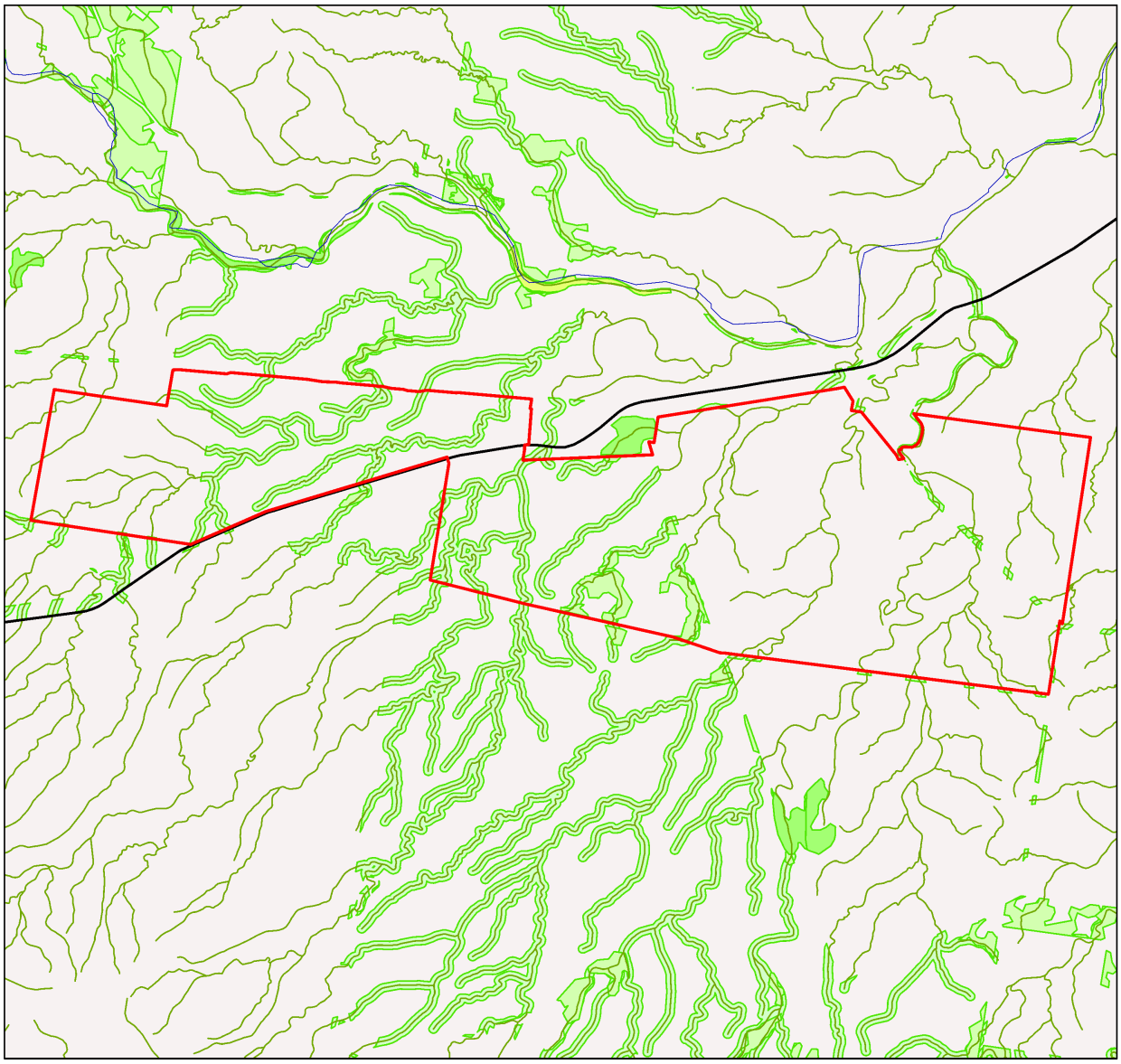
MSES mapping of sea turtle nesting areas identifies beaches where the recorded number of turtle nests are over 1% of the turtle species or genetic stock. The linework is also deliberately extended along nearby rocky coastlines and headlands to recognise that significant numbers of nesting adults and hatchlings can become disoriented by light pollution from development on rocky coastlines and headlands while navigating offshore from nesting beaches.

0 710 1,420 2,130 2,840 3,550 m

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Map 4 - MSES - Regulated Vegetation



MSES - Regulated Vegetation

- ▲ Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Regulated vegetation (intersecting a watercourse)
- Regulated vegetation (100m from wetland)
- Regulated vegetation (category B - endangered or of concern)
- Regulated vegetation (category C - endangered or of concern)
- Regulated vegetation (category R - GBR riverine)
- Regulated vegetation (essential habitat)
- Custom area



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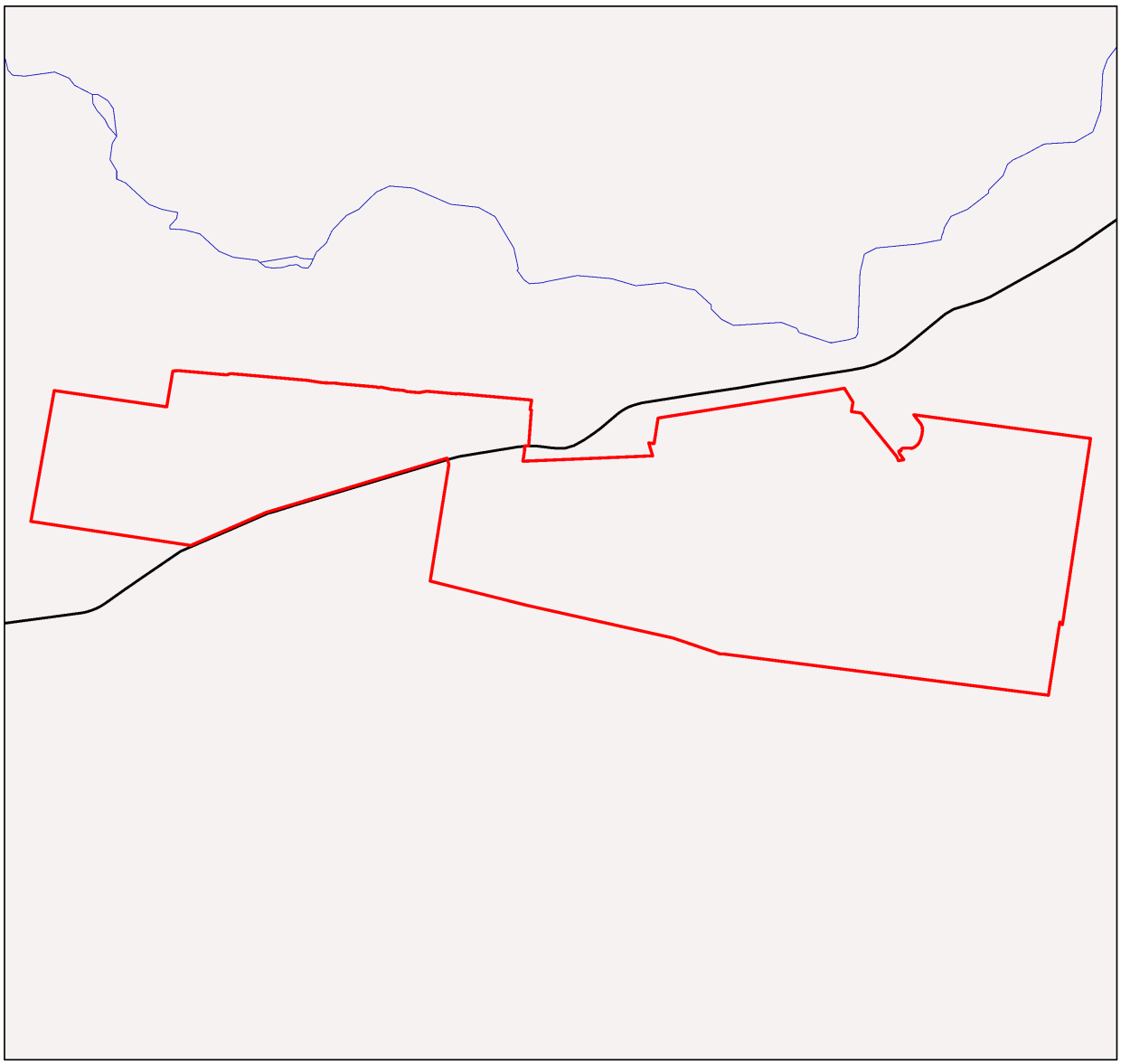
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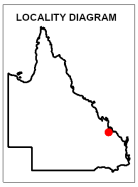
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Map 5 - MSES - Offset Areas



MSES - Offsets

- Towns
- Freeways/Highways
- Secondary roads
- Major rivers/creeks
- Legally secured offset area (offset register)
- Legally secured offset area (vegetation offsets)
- Custom area



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Appendices

Appendix 1 - Matters of State Environmental Significance (MSES) methodology

MSES mapping is a regional-scale representation of the definition for MSES under the State Planning Policy (SPP). Its primary purpose is to support implementation of the SPP biodiversity policy.

MSES mapping does not replace the regulatory mapping or environmental values specifically called up under other laws or regulations.

MSES mapping does not determine whether state or local development assessment is required. For state assessment triggers refer to the Development Assessment Mapping System (DAMS). For local assessment triggers, refer to the relevant local planning scheme.

The Queensland Government's "Method for mapping - matters of state environmental significance can be downloaded from:

http://www.ehp.qld.gov.au/land/natural-resource/method-mapping-mses.html .

Appendix 2 - Source Data

The datasets listed below are available on request from:

http://qldspatial.information.qld.gov.au/catalogue/custom/index.page

- Matters of State environmental significance

Note: MSES mapping is not based on new or unique data. The primary mapping product draws data from a number of underlying environment databases and geo-referenced information sources. MSES mapping is a versioned product that is updated generally on a twice-yearly basis to incorporate the changes to underlying data sources. Several components of MSES mapping made for the current version may differ from the current underlying data sources. To ensure accuracy, or proper representation of MSES values, it is strongly recommended that users refer to the underlying data sources and review the current definition of MSES in the State Planning Policy, before applying the MSES mapping.

Individual MSES layers can be attributed to the following source data available at QSpatial:

MSES layers	**current QSpatial data (http://qspatial.information.qld.gov.au)**
Protected Areas-Estates, Nature Refuges, Special Wildlife Reserves	- Protected areas of Queensland - Nature Refuges - Queensland - Special Wildlife Reserves- Queensland
Marine Park-Highly Protected Zones	Moreton Bay marine park zoning 2008
Fish Habitat Areas	Queensland fish habitat areas
Strategic Environmental Areas-designated	Regional Planning Interests Act - Strategic Environmental Areas
HES wetlands	Map of Queensland Wetland Environmental Values
Wetlands in HEV waters	HEV waters: - EPP Water intent for waters Source Wetlands: - Queensland Wetland Mapping (Current version 5) Source Watercourses: - Vegetation management watercourse and drainage feature map (1:100000 and 1:250000)
Wildlife habitat (threatened and special least concern)	-WildNet database species records - habitat suitability models (various) - SEQ koala habitat areas under the Koala Conservation Plan 2019
VMA regulated regional ecosystems	Vegetation management regional ecosystem and remnant map
VMA Essential Habitat	Vegetation management - essential habitat map
VMA Wetlands	Vegetation management wetlands map
Legally secured offsets	Vegetation Management Act property maps of assessable vegetation. For offset register data-contact DETSI
Regulated Vegetation Map	Vegetation management - regulated vegetation management map

Appendix 3 - Acronyms and Abbreviations

AOI	- Area of Interest
DETSI	- Department of the Environment, Tourism, Science and Innovation
EP Act	- Environmental Protection Act 1994
EPP	- Environmental Protection Policy
GDA2020	- Geocentric Datum of Australia 2020
GEM	- General Environmental Matters
GIS	- Geographic Information System
MSES	- Matters of State Environmental Significance
NCA	- Nature Conservation Act 1992
RE	- Regional Ecosystem
SPP	- State Planning Policy
VMA	- Vegetation Management Act 1999

EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Please see the caveat for interpretation of information provided here.

Report created: 10-Sep-2025

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	8
Listed Threatened Species:	50
Listed Migratory Species:	13

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at https://www.dcceew.gov.au/parks-heritage/heritage

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	23
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have

State and Territory Reserves:	3
Regional Forest Agreements:	None
Nationally Important Wetlands:	None
EPBC Act Referrals:	14
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.
Status of Vulnerable, Disallowed and Ineligible are not MNES under the EPBC Act.

Community Name	Threatened Category	Presence Text	Buffer Status
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community may occur within area	In buffer area only
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community may occur within area	In buffer area only
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community may occur within area	In feature area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community may occur within area	In buffer area only
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	Community likely to occur within area	In feature area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area	In buffer area only
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	Endangered	Community likely to occur within area	In buffer area only
Weeping Myall Woodlands	Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

Status of Conservation Dependent and Extinct are not MNES under the EPBC Act.
Number is the current name ID.

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Calidris acuminata](#) Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
[Calidris ferruginea](#) Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
[Charadrius leschenaultii](#) Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Cyclopsitta diophthalma coxeni](#) Coxen's Fig-Parrot [59714]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
[Erythrotriorchis radiatus](#) Red Goshawk [942]	Endangered	Species or species habitat likely to occur within area	In feature area
[Falco hypoleucos](#) Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Gallinago hardwickii](#) Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Geophaps scripta scripta](#) Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat known to occur within area	In feature area
[Grantiella picta](#) Painted Honeyeater [470]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Hirundapus caudacutus](#) White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Neochmia ruficauda ruficauda](#) Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Poephila cincta cincta			
Southern Black-throated Finch [64447]	Endangered	Species or species habitat may occur within area	In buffer area only
Rostratula australis			
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Stagonopleura guttata			
Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Turnix melanogaster			
Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area	In feature area
FROG			
Taudactylus pleione			
Kroombit Tinker Frog, Pleione's Torrent Frog [1889]	Critically Endangered	Species or species habitat likely to occur within area	In buffer area only
MAMMAL			
Chalinolobus dwyeri			
Large-eared Pied Bat, Large Pied Bat [183]	Endangered	Species or species habitat may occur within area	In buffer area only
Dasyurus hallucatus			
Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] [331]	Endangered	Species or species habitat likely to occur within area	In feature area
Dasyurus maculatus maculatus (SE mainland population)			
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat may occur within area	In buffer area only
Hipposideros semoni			
Semon's Leaf-nosed Bat, Greater Wart-nosed Horseshoe-bat [180]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Macroderma gigas			
Ghost Bat [174]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
[Petauroides volans](#)			
Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area	In feature area
[Petaurus australis australis](#)			
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area	In feature area
[Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)](#)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat likely to occur within area	In feature area
[Potorous tridactylus tridactylus](#)			
Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Pteropus poliocephalus](#)			
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour may occur within area	In feature area
PLANT			
[Arthraxon hispidus](#)			
Hairy-joint Grass [9338]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Bosistoa transversa](#)			
Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
[Bulbophyllum globuliforme](#)			
Miniature Moss-orchid, Hoop Pine Orchid [6649]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
[Cadellia pentastylis](#)			
Ooline [9828]	Vulnerable	Species or species habitat may occur within area	In buffer area only
[Cossinia australiana](#)			
Cossinia [3066]	Endangered	Species or species habitat likely to occur within area	In feature area
[Cupaniopsis shirleyana](#)			
Wedge-leaf Tuckeroo [3205]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Cycas megacarpa [55794]	Endangered	Species or species habitat known to occur within area	In feature area
Cycas ophiolitica [55797]	Endangered	Species or species habitat may occur within area	In buffer area only
Dichanthium setosum bluegrass [14159]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Eucalyptus raveretiana Black Ironbox [16344]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Fontainea venosa [24040]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Leuzea australis listed as Rhaponticum australe Austral Cornflower, Native Thistle [9363]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Polianthion minutiflorum [82772]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Sophora fraseri [8836]	Vulnerable	Species or species habitat may occur within area	In buffer area only
REPTILE			
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Denisonia maculata Ornamental Snake [1193]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area	In feature area
Elseya albagula Southern Snapping Turtle, White-throated Snapping Turtle [81648]	Critically Endangered	Species or species habitat may occur within area	In buffer area only
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area	In feature area
Hemiaspis damelii Grey Snake [1179]	Endangered	Species or species habitat likely to occur within area	In feature area
Rheodytes leukops Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle, White-eyed River Diver [1761]	Endangered	Species or species habitat may occur within area	In buffer area only

Listed Migratory Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Marine Species			
Crocodylus porosus Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat may occur within area	In feature area
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Motacilla flava			
Yellow Wagtail [644]		Species or species habitat may occur within area	In buffer area only
Migratory Wetlands Species			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea			
Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos			
Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Charadrius leschenaultii			
Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Gallinago hardwickii			
Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Numenius madagascariensis			
Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pandion haliaetus			
Osprey [952]		Species or species habitat known to occur within area	In feature area

Other Matters Protected by the EPBC Act

Listed Marine Species			[Resource Information]
Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			

Scientific Name	Threatened Category	Presence Text	Buffer Status
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area overfly marine area	In feature area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]	Vulnerable	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Chalcites osculans as Chrysococcyx osculans Black-eared Cuckoo [83425]		Species or species habitat may occur within area overfly marine area	In buffer area only
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat likely to occur within area overfly marine area	In feature area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat likely to occur within area overfly marine area	In feature area
Motacilla flava Yellow Wagtail [644]		Species or species habitat may occur within area overfly marine area	In buffer area only
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area	In feature area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rostratula australis as Rostratula benghalensis (sensu lato)			
Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus			
Spectacled Monarch [83946]		Species or species habitat may occur within area overfly marine area	In feature area
Reptile			
Crocodylus porosus			
Salt-water Crocodile, Estuarine Crocodile [1774]		Species or species habitat may occur within area	In feature area

Extra Information

State and Territory Reserves			[Resource Information]
Protected Area Name	Reserve Type	State	Buffer Status
Dan Dan	National Park	QLD	In buffer area only
Futter Creek	Conservation Park	QLD	In buffer area only
Kroombit Tops	National Park	QLD	In buffer area only

EPBC Act Referrals				[Resource Information]
Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Big G Pumped Hydropower Energy Storage	2024/10056		Referral Decision	In buffer area only
Callide Wind Farm	2021/9057		Post-Approval	In buffer area only
Calvale to Calliope River Transmission Line Reinforcement Project	2024/10044		Assessment	In buffer area only
Powerlink Gladstone to Larcom Creek 275kV Transmission Line	2003/1229		Completed	In buffer area only
Specimen Hill Wind Farm	2020/8864		Post-Approval	In buffer area only
Upper Calliope Solar Farm	2023/09752		Assessment	In buffer area only
Controlled action				

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Controlled action				
Construct and operate 447km high pressure gas transmission pipeline	2009/4976	Controlled Action	Post-Approval	In feature area
Construction of a high pressure buried gas pipeline, Kogan to Gladstone, QLD	2009/5029	Controlled Action	Post-Approval	In buffer area only
Gas Pipeline with Alternative Pipleine to Supply Natural Gas Liquefaction Park	2008/4096	Controlled Action	Post-Approval	In buffer area only
Queensland Curtis LNG Project - Pipeline Network	2008/4399	Controlled Action	Post-Approval	In buffer area only
Not controlled action				
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area
Moura Link - Aldoga Rail Project	2007/3773	Not Controlled Action	Completed	In buffer area only
Not controlled action (particular manner)				
Calliope Range Deviation - single carriageway, dual lane road along 4.7km of Dawson Highway	2009/4702	Not Controlled Action (Particular Manner)	Post-Approval	In buffer area only
Referral decision				
Gas Transmission Pipeline to supply Natural Gas Liquefaction Park	2008/4061	Referral Decision	Completed	In buffer area only

Caveat

1 PURPOSE

This report is designed to assist in identifying the location of matters of national environmental significance (MNES) and other matters protected by the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) which may be relevant in determining obligations and requirements under the EPBC Act.

The report contains the mapped locations of:

- World and National Heritage properties;
- Wetlands of International and National Importance;
- Commonwealth and State/Territory reserves;
- distribution of listed threatened, migratory and marine species;
- listed threatened ecological communities; and
- other information that may be useful as an indicator of potential habitat value.

2 DISCLAIMER

This report is not intended to be exhaustive and should only be relied upon as a general guide as mapped data is not available for all species or ecological communities listed under the EPBC Act (see below). Persons seeking to use the information contained in this report to inform the referral of a proposed action under the EPBC Act should consider the limitations noted below and whether additional information is required to determine the existence and location of MNES and other protected matters.

Where data is available to inform the mapping of protected species, the presence type (e.g. known, likely or may occur) that can be determined from the data is indicated in general terms. It is the responsibility of any person using or relying on the information in this report to ensure that it is suitable for the circumstances of any proposed use. The Commonwealth cannot accept responsibility for the consequences of any use of the report or any part thereof. To the maximum extent allowed under governing law, the Commonwealth will not be liable for any loss or damage that may be occasioned directly or indirectly through the use of, or reliance on the contents of this report.

3 DATA SOURCES

Threatened ecological communities

For threatened ecological communities where the distribution is well known, maps are generated based on information contained in recovery plans, State vegetation maps and remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species

Threatened, migratory and marine species distributions have been discerned through a variety of methods. Where distributions are well known and if time permits, distributions are inferred from either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc.) together with point locations and described habitat; or modelled (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where little information is available for a species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc.).

In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More detailed distribution mapping methods are used to update these distributions when time permits.

4 LIMITATIONS

The following species and ecological communities have not been mapped and do not appear in this report:

- threatened species listed as extinct or considered vagrants;
- some recently listed species and ecological communities;
- some listed migratory and listed marine species, which are not listed as threatened species; and
- migratory species that are very widespread, vagrant, or only occur in Australia in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- listed migratory and/or listed marine seabirds, which are not listed as threatened, have only been mapped for recorded breeding sites; and
- seals which have only been mapped for breeding sites near the Australian continent

The breeding sites may be important for the protection of the Commonwealth Marine environment.

Refer to the metadata for the feature group (using the Resource Information link) for the currency of the information.

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

-Office of Environment and Heritage, New South Wales
-Department of Environment and Primary Industries, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment, Water and Natural Resources, South Australia
-Department of Land and Resource Management, Northern Territory
-Department of Environmental and Heritage Protection, Queensland
-Department of Parks and Wildlife, Western Australia
-Environment and Planning Directorate, ACT
-Birdlife Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-South Australian Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
Forestry Corporation, NSW
-Geoscience Australia
-CSIRO
-Australian Tropical Herbarium, Cairns
-eBird Australia
-Australian Government – Australian Antarctic Data Centre
-Museum and Art Gallery of the Northern Territory
-Australian Government National Environmental Science Program
-Australian Institute of Marine Science
-Reef Life Survey Australia
-American Museum of Natural History
-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania
-Tasmanian Museum and Art Gallery, Hobart, Tasmania
-Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the Contact us page.

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WildNet Records

(extracted 27/11/2025)

WN Taxon I	Kingdom	Class	Family	Scientific name	Common name	NCA status	EPBC status	Superseded	Conservation significant	Establishment	Sensitive species	Area survey lists	Sighting records	Specimen records	Sighting summary	
324	Animalia	Reptilia	Pygopodidae	Delma torquata	collared delma	V	V	No	Yes	Q	No		4	0	4	
8445	Plantae	Equisetopsida	Cycadaceae	Cycas megacarpa		E	E	No	Yes	NTQ	Yes		62	11	62	
3021	Plantae	Equisetopsida	Hydrocharitaceae	Ottelia ovalifolia subsp. ovalifolia		SL		No	Yes	NTQ	No		1	1	1	
14327	Plantae	Equisetopsida	Menyanthaceae	Nymphoides indica	water snowflake	SL		No	Yes	NTQ	No		1	1	1	
17505	Plantae	Equisetopsida	Orchidaceae	Cymbidium canaliculatum		SL		No	Yes	NTQ	Yes		1	0	1	
5768	Plantae	Equisetopsida	Orchidaceae	Dockrillia bowmanii	scrub pencil orchid	SL		No	Yes	NTQ	Yes		3	0	3	
8197	Plantae	Equisetopsida	Orchidaceae	Geodorum densiflorum	pink nodding orchid	SL		No	Yes	NTQ	Yes		1	1	1	
12659	Plantae	Equisetopsida	Orchidaceae	Sarcochilus dilatatus	brown sarcochilus	SL		No	Yes	NTQ	Yes		1	0	1	
12657	Plantae	Equisetopsida	Orchidaceae	Sarcochilus hillii		SL		No	Yes	NTQ	Yes		1	0	1	
18031	Plantae	Equisetopsida	Pteridaceae	Adiantum hispidulum		SL		No	Yes	NTQ	No		1	0	1	
17672	Plantae	Equisetopsida	Pteridaceae	Ceratopteris thalictroides		SL		No	Yes	NTQ	No		1	1	1	
17396	Plantae	Equisetopsida	Pteridaceae	Doryopteris concolor		SL		No	Yes	NTQ	No		3	0	3	
41594	Plantae	Equisetopsida	Pteridaceae	Pellaea muelleri		SL		No	Yes	NTQ	No		1	1	1	
21889	Plantae	Equisetopsida	Pteridaceae	Pellaea nana		SL		No	Yes	NTQ	No		2	0	2	
17796	Plantae	Equisetopsida	Sterculiaceae	Brachychiton australis	broad-leaved bottle tree	SL		No	Yes	NTQ	No		1	0	1	
17803	Plantae	Equisetopsida	Sterculiaceae	Brachychiton rupestris		SL		No	Yes	NTQ	No		3	0	3	
22414	Plantae	Equisetopsida	Zamiaceae	Macrozamia macleayi		SL		No	Yes	NTQ	Yes		2	0	2	
16707	Plantae	Equisetopsida	Zamiaceae	Macrozamia miquelii		SL		No	Yes	NTQ	Yes		3	2	3	

Appendix B

Likelihood of Occurrence



Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
Fauna					
Birds					
Actitis hypoleucos	Common sandpiper	Mi	SLC	The species utilises a wide range of coastal wetlands and some inland wetlands with varying levels of salinity, mostly around muddy margins or rocky shores and rarely on mudflats. It has been recorded in estuaries and deltas of streams, as well as on banks further upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. The muddy margins utilised by the species are often narrow and may be steep. It is often associated with mangroves, and sometimes found in areas of mud littered with rocks or snags.	**No** – The species has not been recorded within the Project Area but is known from the search extent. The closest record of the species occurs approximately 23 km north-east of the Project Area (ALA 2024). The Project Area is within the species' 'may occur' distribution as per SPRAT. Limited wetland habitat is available within the Project Area with the extent of potential habitat limited to small farm dams which are generally degraded by stock watering. These areas are not considered likely to attract the species given the limited availability of habitat and extent of disturbance.
Apus pacificus	Fork-tailed swift	Mi	SLC	The species is almost exclusively aerial, flying from less than 1 m to at least 300 m above ground and probably much higher.	**Moderate** – This species has not been recorded within the Project Area but it is known from the search extent (within 20 km of the Project Area). The nearest record occurs approximately 18 km south-east of the Project Area in Don Don National Park (ALA 2024). Further records occur more broadly around the Project Area associated with large open waterbodies (such as Lake Awoonga) and State Forests. The Project Area is within the species 'likely to occur' distribution as per SPRAT. While this species is unlikely to physically occupy mapped habitats within the Project Area, it may utilise the airspace above the Project Area during migration or for foraging.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
Calidris acuminata	Sharp-tailed sandpiper	Mi, V	V	The species prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh, or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans, and hypersaline salt lakes inland. They also occur in salt works and sewage farms.	**Low** – The species has not been recorded within the Project Area or the search extent. The closest record is 33 km away on Lake Awoonga (ALA 2024). Records are predominantly associated with coastal environments, however the species has also been recorded far inland. The Project Area is within the species 'may occur' distribution as per SPRAT. Marginal habitat for this species is available within the Project Area with the extent of potential habitat limited to small farm dams which are generally degraded by stock watering.
Calidris ferruginea	Curlew sandpiper	CE, Mi	CE	The species mainly occurs on intertidal mudflats in sheltered coastal areas such as estuaries, bays, inlets and lagoons, and around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded less often inland, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand, occurring in both fresh and brackish waters.	**Low** – The species has not been recorded within the Project Area or the search extent. The closest record is 33 km away on Lake Awoonga (ALA 2024). The Project Area is within the species 'may occur' distribution as per SPRAT. Marginal habitat for this species occurs within the Project Area with the extent of potential habitat limited to small farm dams which are generally degraded by stock watering.
Calidris melanotos	Pectoral sandpiper	Mi	SLC	The species prefers shallow fresh to saline wetlands. It is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains, and artificial wetlands.	**No** – The species has not been recorded within the Project Area or the search extent. The closest record is approximately 95 km north-east of the Project Area near Yeppoon (ALA 2024). The Project Area is within the species 'may occur' distribution as per SPRAT. Suitable habitat for this species is largely absent from the Project Area though small pockets of potentially suitable habitat occurs in association with farm dams. These areas are generally heavily degraded by stock watering and are considered marginally suitable to the species.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
Charadrius leschenaultii	Greater sand plover	V, Mi	V	The species is almost entirely coastal, inhabiting littoral and estuarine habitats. They mainly occur on sheltered sandy, shelly, or muddy beaches with large intertidal mudflats or sandbanks, as well as sandy estuarine, and inshore reefs, rock platforms, small rocky islands, or sand cays on coral reefs.	**No** – The species has not been recorded within the Project Area but has been identified within the search extent. The closest record occurs approximately 17 km north of the Project Area dated from 2010. This record has a high degree of spatial accuracy and is located approximately 45 km inland from the coast (ALA 2024). While this record occurs approximately the same distance inland as the Project Area, the Project Area lacks any suitable wetland habitat that may support this species for foraging or roosting. The Project Area is within the species 'may occur' distribution as per SPRAT. Generally coastal, this species required open flats to forage which are not present within the Project Area.
Cyclopsitta diophthalma coxeni	Coxen's fig-parrot	CE	CE	The species occurs in rainforest habitats including subtropical rainforest, dry rainforest, littoral and developing littoral rainforest, and vine forest, from sea level to approximately 900 m above sea level (ASL). The species is likely to favour alluvial areas that support figs and other trees with fleshy fruits. It has also been recorded in other habitat types including corridors of riparian vegetation in woodland, open woodland or other types of cleared habitat and isolated stands of fig or other trees on urban, agricultural or cleared land.	**No** – This species has not been recorded within the Project Area or the search extent. The nearest record of this species occurs approximately 70 km south of the Project Area, however, this record is dated from 1970 (ALA 2024). The Project Area occurs outside of the species' distribution as per SPRAT. The species is very uncommon within habitats where it is known to occur (in south-east Queensland) and it is unlikely to persist in habitats proximal to the Project Area. While dense vegetation supporting fig tree species (*Ficus sp.*) occur along watercourses within the Project Area, the species is not known from the region and is highly unlikely to occur.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
Cuculus optatus	Oriental cuckoo	Mi	SLC	The species uses a range of vegetated habitats such as monsoon rainforest, wet Sclerophyll forest, open woodlands and often along edges of forests, or ecotones between forest types.	**Moderate** – The species has not been recorded within the Project Area or the search extent. The nearest record occurs approximately 30 km south-east of the Project Area near Wietalaba National Park, with additional records occurring further east and fewer to the west (ALA 2024). The Project Area is within the species' 'may occur' distribution as per SPRAT. Suitable habitat for the species occurs within the Project Area associated with vegetated creeklines and open woodlands.
Erythrotriorchis radiatus	Red goshawk	V	E	The species occurs in coastal and sub-coastal tall open forests and woodlands, preferring areas with a mosaic of vegetation types, permanent water, and abundant small birds. Associated with gorge and escarpment country in partially cleared country in eastern Queensland.	**Unlikely** – The species has not been recorded within the Project Area or the search extent. Records exist approximately 25 km south of the Project Area in Kroombit Tops National Park, though the latest of these records is from 1997 (ALA 2024). The species has not been recorded in central / southern Queensland recently and is considered extinct from the regions, persisting only in north Queensland. The Project Area is within the species' 'likely to occur' distribution as per SPRAT. Suitable habitat including permanent water, tall forests and woodlands and a mosaic of vegetation communities are limited within the Project Area. In addition, the Project Area does not contain gorge or escarpment country and riparian vegetation is narrow and disconnected.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
Falco hypoleucos	Grey falcon	V	V	The species frequents timbered lowland plains, particularly Acacia shrublands that are crossed by tree-lined water courses. The species has been observed hunting in treeless areas and frequents tussock grassland and open woodland, especially in winter.	**No** – The species has not been recorded within the Project Area or the search extent. The closest record is 109 km west of the Project Area associated with the Dawson River near Moura, however this record is undated, and has a high degree of spatial uncertainty. It is likely that this record originated from further west in the arid or semi-arid zones. No suitable arid or semi-arid habitat occurs within the Project Area which is largely comprised of eucalyptus woodlands, paddock trees and cleared areas. The Project Area is outside of the arid and semi-arid zones where the base annual rainfall is less than 350 mm annually.
Geophaps scripta scripta	Squatter pigeon (southern)	V	V	The species occurs in open, dry woodland with a grassy understorey in proximity to permanent water. Prefers areas of sandy soil with sparser cover of low grasses; and less common on heavier soils with dense grass cover.	**Known** – This species has been recorded on 10 occasions totalling 12 individuals recorded within the Project Area during the December 2021 and February 2024 Umwelt field surveys. All of these observations fell within the DA2 Project Area. This species was recorded occupying a diversity of habitats including non-remnant pasture grassland, banks of farm dams and low regrowth shrubland.
Gallinago hardwickii	Latham's snipe	Mi, V	V	In Australia, the species occurs in permanent and ephemeral wetlands up to 2,000 m ASL. They usually inhabit open, freshwater wetlands with low, dense vegetation such as swamps, flooded grasslands or heathlands, around bogs and other water bodies.	**Moderate** –The species has been recorded within the Project Area (ALA 2024) however, no date is known for this record, and it is associated with a high degree of spatial uncertainty. The next closest record occurs 30 km east near lake Awoonga dated 2015. The Project Area occurs in the species' 'likely to occur' distribution as per SPRAT.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
					The Project Area contains some suitable wetland habitat where farm dams and watercourses are present. Despite the regular occurrence of cattle, one large farm dam provides trailing bank vegetation that could be utilised by the species for shelter, as well as providing areas to forage in shallow margins of farm dams.
Grantiella picta	Painted honeyeater	V	V	Mostly occurs in woodland habitats which have an abundance of mistletoes. These woodlands are usually dominated by Acacia spp. (e.g. *A. harpophylla*, *A. pendula,* and *A. aneura*), *Casuarina cristata* and *Allocasuarina luehmannii*. Also found in *Callitris glaucophylla* woodlands in the eastern part of their range, if mistletoes are abundant	**Low** – The species has not been recorded within the Project Area or the search extent. Records of the species are uncommon in the Project region with the main population concentration trending north-west, away from the coast. The nearest record exists approximately 47 km south-west of the Project Area near Biloela (ALA 2024). This record is an outlier indicating that a small percentage of the population is likely to utilise areas west of the Project Area. The Project Area is within the species' 'may occur' distribution as per SPRAT. Some habitat suitable for the species exists where mistletoe has been recorded in eucalypt or acacia woodlands. Despite being uncommon, mistletoe was recorded at one location in the southern extent of the Project Area.
Hirundapus caudacutus	White-throated needletail	V, Mi	V	The species is found across a range of habitats, more often over woodland areas, where it is almost exclusively aerial, though it roosts in tree hollows and the foliage canopy. It forages for insects aerially, often forming mixed feeding flocks with other species. The species roosts in tall trees at night, mainly in forest habitats.	**Moderate** - The species has been historically observed within the Project Area (no date supplied) (ALA 2024). Further records exist within the search extent generally associated with large patches of remnant vegetation. The Project Area is within the species 'likely to occur' distribution as per SPRAT. This species is likely to utilise the airspace above vegetated areas within the Project Area to forage. Roosting may occur within large trees associated with woodlands and forests within the Project Area.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
Limosa lapponica baueri	Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit	E	E	This species forages near the edge of water bodies or in shallow eater within the intertidal zone of estuaries and harbours. Foraging usually occurs on exposed sandy or soft mud substrates on intertidal flats and beaches. Roosting occurs on large intertidal sandflats, spits and banks. Occasionally roosts occur within mudflats, estuaries, coastal lagoons and bays.	**No** – The species has not been recorded within the Project Area or the search extent. The nearest records of this species occur in association with coastal habitats approximately 42 km east of the Project Area (ALA 2024). The Project Area occurs outside of the species mapped distribution as per SPRAT. No suitable intertidal habitat for this species occurs within the Project Area. Some farm dams exist which are unlikely to provide suitable resources for the species.
Limosa lapponica	Bar-tailed godwit	Mi	SLC	This species forages near the edge of water bodies or in shallow eater within the intertidal zone of estuaries and harbours. Foraging usually occurs on exposed sandy or soft mud substrates on intertidal flats and beaches. Roosting occurs on large intertidal sandflats, spits and banks. Occasionally roosts occur within mudflats, estuaries, coastal lagoons and bays.	**No** – The species has not been recorded within the Project Area or the search extent. The nearest records of this species occur in association with coastal habitats approximately 42 km east of the Project Area (ALA 2024). The Project Area occurs outside of the species mapped distribution as per SPRAT. No suitable intertidal habitat for this species occurs within the Project Area. Some farm dams exist which are unlikely to provide suitable resources for the species.
Motacilla flava	Yellow wagtail	Mi	SLC	Habitat requirements for the species are highly variable, but typically include open grassy flats near water. Habitats include open areas with low vegetation such as grasslands, airstrips, pastures, sports fields; damp open areas such as muddy or grassy edges of wetlands, rivers, irrigated farmland, dams, waterholes; sewage farms, sometimes utilise tidal mudflats and edges of mangroves.	**No** – The species has not been recorded within the Project Area or the search extent. Records of this species are uncommon in the Project region as this species is a vagrant bird to Australia with the nearest record occurring approximately 47 km east of the Project Area near Tannum Sands dated 2016 (ALA 2024).

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
					The Project Area occurs outside of the species' mapped distribution as per SPRAT. While suitable low, open vegetation occurs within the Project Area, this habitat is widespread throughout Queensland and the species is unlikely to be attracted to the Project Area due to the availability of habitat.
Neochmia ruficauda ruficauda	Star finch	E	E	The species inhabits tall grass and reed beds associated with swamps and watercourses. It may also be found in grassy woodlands, open forests and mangroves.	**No** – The subspecies has not been recorded within the Project Area or the search extent. The closest record is 86 km away in the Rockhampton region, however this record is historical (dated 1860) (ALA 2024). The subspecies has undergone a significant reduction in range and is now considered potentially extinct. Some areas within the Project Area may meet the species foraging requirements with grasslands and reeds around agricultural dams. However, these areas consist primarily of exotic vegetation and are generally degraded by stock.
Numenius madagascariensis	Eastern curlew	CE, Mi	CE	The species occurs in sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass (Zosteraceae). The species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. They are often recorded among saltmarsh and on mudflats fringed by mangroves, and sometimes within the mangroves. They are also found in coastal saltworks and sewage farms.	**No –** The subspecies has not been recorded within the Project Area or the search extent. Records exist in association with coastal environments to the east of the Project Area, however, no valid records are known from freshwater environments within the Project region. The Project Area is partially within the species' 'may occur' distribution as per SPRAT. No intertidal marine habitat is available within the Project Area. Therefore, there is an unlikely likelihood it occurs within the Project Area

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
Pandion haliaetus	Osprey	Mi	SLC	Along rivers, creeks or other vegetated waterways where the waterway supports occasional pools	**Moderate** – The species has been recorded within the Project Area based on an undated record (ALA 2024) submitted with a high degree of spatial uncertainty. The next closest record exists approximately 1.8 km north of the Project Area on Mount Alma Road associated with Harper Creek. This record is likely derived from a large nearby waterbody (farm dam) and is dated from 2016. The Project Area is within the species' 'likely to occur' distribution as per SPRAT. While the species has been recorded recently and nearby, the Project Area supports very little suitable habitat for the species. Approximately 350 m east of the Project Area is Tom's Hole, a large freshwater wetland off Tom's Creek. Dispersal habitat for the species may occur in association with riparian vegetation along mapped watercourses. During dispersal inland, the species may intermittently utilise farm dams to hunt for fish, though this is likely limited to the condition of the waterbody and the availability of fish prey.
Poephila cincta cincta	Southern black-throated finch	E	E	The species inhabits grassy, open woodlands and forests, typically dominated by *Eucalyptus spp.* including *E. crebra*, *E. camaldulensis* and *E. melanophloia*, *Corymbia spp.* and *Melaleuca spp.* and occasionally in tussock grasslands or other habitats often along or near watercourses, or in the vicinity of water.	**No** – The species has not been recorded within the Project Area or the search extent. Historical records exist in Gladstone and Rockhampton, with further records extending north-west into areas previously occupied by the subspecies. No relevant records are known from within 100 km of the Project Area and the species is considered absent from the region (ALA 2024). While grassy woodland habitat occurs within the Project Area, it is outside of the species mapped distribution as per the SPRAT.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
Rostratula australis	Australian painted snipe	E	E	The species occurs in shallow freshwater wetlands or saltmarshes, including inundated grasslands, dams and bore drains, generally with good cover of grasses or low scrub.	**Low** – The species has not been recorded within the Project Area or the search extent. Few records of the species occur within the Project region with the closest occurring approximately 44 km away in Gladstone dated 2011 (ALA 2024). While few records exist, the species is widespread in eastern Australia and is highly mobile. The Project Area is within the species' 'likely to occur' habitat as per SPRAT. Some preferred habitat is within the Project Area, though limited to agricultural dams with varying degrees of disturbance mostly from stock and weed incursion. These habitats lack timber structure and overhanging bank vegetation and are not considered suitable to support the species.
Stagonopleura guttata	Diamond firetail	V	V	Habitat includes Eucalyptus, Acacia or Casuarina woodlands, open forests and other lightly timbered habitats, including farmland and grassland with scattered trees. Includes areas of relatively low tree density, few large logs and little litter cover but high grass cover.	**Low –** The species was not recorded within the Project Area during field surveys, but it is known from one record located approximately 19 km east of the Project Area (ALA 2025). This record has a high degree of spatial uncertainty, and no date has been attributed. The next nearest records of the species occur approximately 75 km south of the Project near Kalpower where a number of records were made in 2019 and 2020. The Project Area occurs partially within the species' 'may occur' distribution as per SPRAT with the remaining area located outside of this mapping. Diamond firetail is uncommon in the Project region, with the concentration of the species population occurring further south into south-east

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
Tringa nebularia	Common greenshank	E	E	The species is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons.	**No** – The species has not been recorded within the Project Area. There is one record within the Project Area with a high spatial inaccuracy of 9 km. The nearest accurate record of the species occurs near Taragoola near Lake Awoonga however this record is dated from 1979 (ALA 2024). Further, more recent records occur to the north near Port Alma where the species has been recorded on multiple occasions associated with tidal pools and estuaries. The Project Area occurs outside of the species' mapped distribution as per SPRAT. No suitable habitat is present within the Project Area with the extent of wetland habitats limited to degraded agricultural dams. These areas are unlikely to provide suitable habitat resources for the species.
Turnix melanogaster	Black-breasted button-quail	V	V	The species is restricted to rainforests and forests, mostly in areas with 770-1200 mm rainfall per annum. They prefer drier low closed forests, particularly semi-evergreen vine thicket, low microphyll vine forest, *Araucarian microphyll* vine forest and *Araucarian notophyll* vine forest. They may also be found in low, dense Acacia thickets and, in littoral areas, in vegetation behind sand dunes.	**Low** – This species has not been recorded within the Project Area or the search extent. Records of this species occur throughout the east coast of Queensland, generally associated with dense thickets and coastal forest. The nearest relevant records occur north-east of the Project Area near Tannum Sands, approximately 45 km east. These records are dated from 2022 (ALA 2024). The Project Area is within the species' 'may occur' distribution as per SPRAT. Limited habitat occurs within the Project Area that could support this species with the extent of dense vegetation confined to watercourse lines which have generally experienced a high degree of disturbance. These areas are not connected to adjacent suitable habitat and are unlikely to provide a corridor for movement of the species.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
Mammals					
Chalinolobus dwyeri	Large-eared pied bat	E	E	Sandstone cliffs and fertile woodland valley habitat within proximity of each other is habitat of importance to the species. Rainforest and moist eucalypt forest habitats on other geological substrates (rhyolite, trachyte and basalt) at high elevation are of similar importance.	**No** – The species has not been recorded within the Project Area or search extent. The nearest records exist approximately 190 km west of the Project Area in the Dawson State Forest, and further south in the Arcadia Valley (ALA 2024). The Project Area does not occur within the species' mapped distribution as per SPRAT. No suitable sandstone cliffs or caves occur within or around the Project Area and as such, the species is unlikely to utilise eucalypt woodland within the Project Area for foraging.
Dasyurus hallucatus	Northern quoll	E	-	This species occupies a diversity of habitats including rocky areas, eucalypt forest and woodlands, rainforests, sandy lowlands and beaches, shrubland, grasslands and desert. The species generally requires some form of rocky area for denning purposes, with surrounding vegetated habitats used for foraging and dispersal.	**Low** - This species was identified in the PMST as 'species or species habitat likely to occur' within the Project Area. A WildNet record from 2009 occurs approximately 40 km north of the Project Area in Telina, Gladstone. Numerous ALA records are also known from Kroombit Tops National Park, approximately 28 km south-east of the Project Area, with the most recent from 2018. Within the Project Area, suitable habitat for the northern quoll is limited, as the species prefers rocky landscape features and surrounding vegetated habitats. Given that the Project Area is dominated by non-remnant pastures on low-relief landforms and lies at the southern extent of the species' known distribution, the likelihood of occurrence is considered low.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
Dasyurus maculatus maculatus (SE mainland population)	Spotted-tailed quoll	E	E	The species inhabits a variety of habitats, all characterized by high and predictable seasonal rainfall. The southern subspecies has been recorded from a wide range of habitats including rainforest, wet and dry Sclerophyll forest, coastal heathland, scrub and dunes, woodland, heathy woodland, swamp forest, mangroves, on beaches and sometimes in grassland or pastoral areas adjacent to forested areas. Both wet and dry forest habitats have recorded relatively high densities of this species. Den sites include rock crevices, hollow logs, hollow tree buttresses, tree hollows, windrows, vegetation clumps, caves, boulder tumbles, under buildings, and underground burrows, including those of rabbits and wombats. Maternal dens are found in rock crevices, caves, boulder tumbles, hollow logs, hollow tree roots, and burrows. When a suitable substrate is available, female quolls will dig burrows.	**No** – The species has not been recorded within the Project Area or the search extent. The closest record occurs approximately 17 km away, however, this record is dated from 1935 (ALA, 2024). The Project Area occurs outside of the species mapped distribution as per SPRAT. Limited suitable habitat occurs within the Project Area. While eucalypt woodland occurs within the Project Area, they are not connected to high value habitats and areas of suitable habitat are not extensive. In addition, denning opportunities are uncommon with the absence of rocky areas.
Hipposideros semoni	Semon's leaf-nosed bat	V	E	The species mainly occurs in rainforest and in riparian vegetation adjacent to rainforest. Roost sites have been recorded in abandoned buildings, houses, caves, trees, old mines, cracks in rocks and under rock overhangs. Not much is known on the ecology of this species.	**No** – The species has not been recorded within the Project Area or the search extent. The closest records occur approximately 28 km south of the Project Area in Kroombit Tops National Park (ALA 2024). These records are associated with habitat connected to potential roost sites and occur in dense rainforest or riparian vegetation with a high degree of connectivity to surrounding habitat. The Project Area occurs outside of the species' mapped distribution as per SPRAT.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
					Woodlands suitable for this species are absent from the Project Area which is largely comprised of previously cleared regrowth woodland and patches of degraded remnant vegetation. A low degree of connectivity to surrounding habitats is afforded by the Project Area.
Macroderma gigas	Ghost bat	V	E	The species occurs throughout a wide range of habitats from rainforest, monsoon and vine scrub to open woodlands in arid areas. These habitats are used for foraging, while roost habitat is more specific. Favoured roosting sites of the species are undisturbed caves or mineshafts which have several openings.	**Low** – The species has not been recorded within the Project Area or the search extent. One record of the species exists directly west (approximately 46 km) and another to the north-east (approximately 42 km). Both of these records are dated from 1985. The nearest relevant records to the Project Area occur at Mount Etna, approximately 108 km north of the Project Area, north of Rockhampton (ALA 2024). The Project Area is within the species' 'likely to occur' distribution as per SPRAT. No suitable cave sites occur within the Project Area and the surrounding landscape is unlikely to provide roosting habitat. Therefore, the species is unlikely to utilise eucalypt woodland within the Project Area for foraging.
Nyctophilus corbeni	Corben's long-eared bat	V	V	The species inhabits a range of inland dry forest habitats including *Eucalyptus camaldulensis*, mallee, *Acacia harpophylla* and other arid and semi-arid habitats; in southern Queensland it is more common in box, ironbark and cypress pine forests on sandy soils. The species is most abundant in vegetation with a distinct canopy and a dense, cluttered shrub layer, and in large, continuous remnants. Roosts solitarily in tree hollows, crevices, and under loose bark	**Low** – The species has not been recorded within the Project Area or the search extent. Records are uncommon within the Project region, occurring further west with the nearest record occurring approximately 185 km west of the Project Area in the Dawson Range State Forest (ALA 2024). The Project Area occurs outside of the species' mapped distribution as per SPRAT. Woodland habitat occurring within the Project Area is marginally suitable for the species, primarily lacking the cluttered understory and roosting opportunities of habitat further west of the Project

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
				(particularly on dead A*llocasuarina luehmannii* or *Casuarina cristata*.	Area in the Brigalow Belt. The species also requires large patches of suitable habitat which are not afforded within the Project Area.
Petauroides volans volans	Southern greater glider	E	E	The species is largely restricted to eucalypt forests and woodlands; it is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. This species is known to occur from Bundaberg in Queensland to Victoria and includes two subspecies (*Petauroides volans* incus and *Petauroides volans volans*).	**Moderate** – The species has not been recorded within the Project Area but is known from the search extent. Records exist between 10 km and 20 km south of the Project Area in Maxwelton State Forest dating from 2017 to 2020. The Project Area occurs within the species' 'likely to occur' distribution as per SPRAT. The species may use eucalypt woodlands within the Project Area, particularly areas where hollows suitable for denning occur.
Petaurus australis brevirostrum	Yellow-bellied Glider (south-eastern)	V	V	The species occurs in eucalypt-dominated woodlands and forests, including both wet and dry Sclerophyll forests. It shows a preference for large patches of mature old growth forests that provide suitable trees for foraging and shelter. There is also a clear preference for forests with a proportion of winter-flowering and smooth-barked eucalyptus. The species requires some level of floristic diversity to provide a year round food supply and are unlikely to persists in forests dominated by only one or two tree species.	**Low** – The species has not been recorded within the Project Area or the search extent. Records of the species occur approximately 20 km west of the Project Area in the Don River State Forest, and further south in the Maxwelton State Forest and Kroombit Tops National Park (ALA 2024). These records are associated with large patches of continuous eucalyptus forest and woodland. The Project Area occurs partially within the species' 'may occur' distribution as per SPRAT. While eucalypt woodland is mapped within the Project Area, the species requires large patches of suitable habitat for population maintenance. Habitats within the Project Area are largely fragmented and occur mostly in regrowth condition. These areas are considered to have a low likelihood of supporting a population of the species.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
Phascolarctos cinereus	Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)	E	E	The species inhabits a range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by Eucalypt species. The species is limited by habitat (restricted to below 800 m ASL, temperature and, at the western and northern ends of the range, leaf moisture.	**Moderate** – The species has been historically observed within the Project Area with a single record occurring in the north-western corner along Duck Holes Creek in 1985 (ALA 2024). Most records of the species in the project region are historical, recorded in either the 1980s or 1990s, with the nearest relevant record occurring approximately 24 km north-east of the Project Area near Aldoga, dated 2015. The Project Area is within the species' 'likely to occur' distribution as per SPRAT. If the species is present within the region, it may use eucalypt woodland vegetation and paddock trees within the Project Area for breeding, foraging and dispersal.
Potorous tridactylus tridactylus	Long-nosed Potoroo (northern)	V	V	Long-nosed potoroo occurs in wet eucalypt forests to coastal heath and scrubs. There is no consistent pattern to the habitat of the species apart from the presence of an abundant supply of fungi (for food) and dense vegetation for shelter.	**No** – The species has not been recorded within the Project Area or the search extent. The nearest record exists approximately 70 km south-east of the Project Area associated with Bulburin National Park (ALA 2024). The Project Area occurs outside of the species' mapped distribution as per SPRAT. No wet eucalypt forest occurs within the Project Area and mapped eucalypt woodlands have a limited degree of connectivity with surrounding habitats.
Pteropus poliocephalus	Grey-headed flying-fox	V	LC	The species occurs in rainforests, open forests, woodlands and melaleuca swamps. Roosting camps are usually in dense riparian vegetation.	**Moderate** – The species has not been recorded within the Project Area or the search extent. The nearest record of the species is from a flying-fox camp in Calliope located approximately 28 km east of the Project Area dated 2019 (ALA 2024). The Project Area occurs within the species' 'may occur' distribution as per SPRAT.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
					The Project Area contains suitable winter/spring flowering eucalypts suitable for foraging in mapped woodlands and is within the nightly foraging commute distance of the Calliope flying-fox camp.
Reptiles					
Delma torquata	Adorned delma	V	V	The species inhabits eucalypt-dominated woodlands and open-forests in Queensland Regional Ecosystem Land Zones 3 (alluvium), 9 (undulating country on fine-grained sedimentary rocks) and 10 (sandstone ranges).	**Low** – The species has not been recorded within the Project Area or the search extent. Records of the species occur within the Project region associated with slopes of the Great Dividing Range. In particular, records are known from Kroombit Tops National Park located approximately 30 km south of the Project Area dated 2010. One further record exists 50 km north-west of the Project Area on the Ulam Range, however, this record is dated 1989. The Project Area is within the species' 'may occur' distribution as per the SPRAT. Vegetation structure within the Project Area is similar to where this species has been recorded, however, habitats within the Project Area are subject to a high degree of disturbance from grazing and clearing. Large areas of the Project Area are mapped as regrowth vegetation and is unlikely to support the species.
Denisonia maculata	Ornamental snake	V	V	The species inhabits lower-lying subtropical areas with deep-cracking clay soils and adjacent slightly elevated ground of clayey and sandy loams. The species is also found in vegetation of woodland and shrub land, including *Acacia harpophylla*, riverside woodland and open forest, particularly on natural levees.	**Low** – The species has not been recorded within the Project Area or the search extent. The nearest record occurs approximately 45 km south-west of the Project Area near Biloela (ALA 2024). The Project Area is partially within the species 'likely to occur' distribution as per SPRAT. While limited habitat for this species occurs within the Project Area in association with vegetation occurring on land zone 3 these areas do not support relevant

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
					microhabitat features including cracking clays or high water retention capacity necessary for the long-term maintenance of prey species, including frogs. In addition, these areas are often degraded by stock and do not support the range of microhabitat features required by the species (primarily soil cracks).
Egernia rugosa	Yakka skink	V	V	The species occurs in a variety of drier forests and woodlands, usually on well-drained, gritty soils, including *Eucalyptus populnea* on alluvial soils, *Callitris glaucophylla* on sands, *Allocasuarina luehmannii*, *Acacia harpophylla*, *Acacia catenulata* and *Acacia aneura*. The species inhabits burrows, abandoned rabbit warrens, and hollow logs or in deep rock crevices.	**Moderate** – The species has not been recorded within the Project Area or the search extent. The closest record is 29 km away near Mount Larcom (ALA 2024), however this record is associated with a high degree of spatial uncertainty. The Project Area is within the species' 'may occur' distribution as per SPRAT. Some suitable habitat may be present on land zone 3, analogous with RE 11.3.2 (*Eucalyptus populnea*) woodlands on alluvial soils, where rocks, logs and dense ground cover is present. Given the species is wide-spread, highly cryptic and found in a broad range of habitat types. Therefore, based on the precautionary principle, with suitable habitat and microhabitat present in the Project Area, *E. rugosa* is assumed to have a moderate likelihood of occurrence.
Elseya albagula	Southern snapping turtle	CE	CE	The species is only found in the Burnett, Fitzroy, Raglan and Mary River drainages of south-east Queensland. It prefers permanent flowing water habitats where there are suitable shelters and refuges.	**No –** The species has not been recorded within the Project Area or the search extent. Records of this species are uncommon within the Project region with the nearest occurring approximately 28 km north near Ambrose (ALA 2024). The Project Area occurs outside of the species' mapped distribution as per SPRAT. No records are known from the Calliope River catchment where the watercourses of the Project Area occur.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
					Watercourses which do occur within the Project Area are ephemeral and do not flow year round.
Furina dunmalli	Dunmall's snake	V	V	The species is found in a broad range of habitats, including forests and woodlands on black alluvial cracking clay and clay loams dominated by *Acacia harpophylla*, *Acacia spp. Callitris spp*. or *Allocasuarina luehmannii*; and *Corymbia citriodora*, *Eucalyptus crebra* and/or *E. melanophloia*, *Callitris glaucophylla* and/or *A. luehmannii* open forest and woodland associations on sandstone derived soils.	**Low** – The species has not been recorded within the Project Area or the search extent. The nearest relevant record to the Project Area occurs 57 km south near Cania dated 2013 (ALA 2024). Other records occur near Gladstone and Tannum Sands, however these are historical and associated with a high degree of spatial uncertainty. The Project Area is within the species' 'may occur' distribution as per SPRAT. Alluvial soils occur within the Project Area and may form cracking clays in some areas however, microhabitat values such as dense woody debris used as shelter is rarely abundant as is preferred by the species. This habitat may be considered 'suitable habitat' as per *Draft Referral Guidelines for Nationally Listed Brigalow Belt Reptiles*, however, these areas are usually subject to a high degree of disturbance from stock. Associated tree species are uncommon on alluvial soils within the Project Area.
Hemiaspis damelii	Grey snake	E	E	In Queensland, grey snake habitat is *Acacia harpophylla* and *Casuarina cristata* woodlands on heavy, dark brown to black cracking clay soils, particularly in association with water bodies, areas with small gullies and ditches, and floodplain environments where the species shelters beneath logs, rocks and soil cracks. Habitat in Queensland also includes *Dichanthium sericeum* and/or *Astrebla* spp. grassland on alluvial plains with cracking clay soils. Grey snake occurrence on the western downs of Queensland has a strong positive association with red sodosol soils which have a strong texture contrast between	**No** - The species has not been recorded within the Project Area or the search extent. Records of the species within the Project region are rare. The nearest records occur near Rockhampton, approximately 81 km north of the Project Area (ALA 2024). The Project Area is within the species' 'may occur' distribution as per SPRAT. Limited habitat is available within the Project Area for this species given the absence of *Acacia harpophylla* and *Casuarina cristata*. In addition, the Project Area lacks suitable landforms which support gilgai and cracking clays necessary for prey species and the grey snake's long brumation period. The

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
				the A horizon and sodic B horizon, and which are often quite dense and coarsely structured (blocky, prismatic or columnar peds) favouring the crack-inhabiting and foraging ecology of this species (Apan et al. 2010). Key attributes of grey snake habitat are the floodplains and ephemeral wetlands which provide breeding habitat for the frog species that are its main prey, the presence of the frog species themselves, and the heavy clay soils which provide and cracks and crevices that the species uses in its hunting strategy and for shelter.	Project Area is largely comprised of eucalypt woodlands and pasture grassland.
Rheodytes leukops	Fitzroy river turtle	V	V	The species is a benthic feeder that occurs in flowing rivers with large deep pools with rocky, gravelly, or sandy substrates, connected by shallow riffles. Preferred areas have high water clarity and are often associated with ribbonweed (Vallisneria sp.) beds. Commonly associated riparian vegetation includes *Eucalyptus tereticornis*, *Casuarina cunninghamiana*, *Melaleuca viminalis* and *Melaleuca linariifolia*.	**No** – The species has not been recorded within the Project Area or the search extent. No records of the species exist within the Calliope River catchment with the nearest record occurring in the Fitzroy River catchment approximately 67 km north of the Project Area in the Fitzroy River (ALA 2024). The Project Area is partially within the species' 'may occur' distribution as per SPRAT. Watercourses of the Project Area are ephemeral and do not contain large, deep pools which are suitable to this species.
Amphibians					
Taudactylus pleione	Kroombit tinker frog	CE	CE	The species is known to occur in *Archontophoenix cunninghamiana* rainforest and boulder scree gullies. It is found around rocky shelves and boulders, under rocks or in deep rock piles near temporary streamlines, seepage zones and in sheltered rock fragments at the base of cliffs (rocky scree). Important habitat for this species has been identified as rainforest patches over 500 m in altitude in Kroombit Tops National Park and Kroombit Forest Reserve.	**No** – The species has not been recorded within the Project Area or the search extent. The closest record is 32 km south of the Project Area in Kroombit Tops National Park, dated 2015 (ALA 2024). The Project Area occurs outside of the species' mapped distribution as per SPRAT. Suitable rainforest and boulder scree gully habitat is not present within the Project Area and this species is only known from within Kroombit Tops National Park and Kroombit Forest Reserve.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
Other Migratory species					
Crocodylus porosus	Salt-water crocodile	Mi	V	The species mostly occurs in tidal rivers, coastal floodplains and channels, billabongs and swamps up to 150 km inland from the coast. It usually inhabits the estuarine reaches of rivers. In Queendland, the species is usually restricted to coastal waterways and floodplain wetlands. Floating rafts of vegetation provide important nesting habitat.	**No** – The species has not been recorded within the Project Area or the search extent. The nearest relevant records of the species occur in the Fitzroy River approximately 80 km north of the Project Area (ALA 2024). The Project Area occurs within the species' 'likely to occur' distribution as per SPRAT. Watercourses within the Project Area are unlikely to support this species given their ephemeral nature, the distance from coastal environments and the species absence or infrequent occupation of marine habitats at the mouth of the Calliope River.
Flora					
Acacia eremophiloides	-	V	V	*Acacia eremophiloides* is found predominantly in open forest or open woodland with an open to sparse shrub understorey. It grows on exposed rocky granite ridges and in open communities among large granite boulders. It occurs on shallow, sandy, well-drained soils, comprising decomposed granite and organic matter. *A. eremophiloides* is found at altitudes between 460-550 m.	**Low** – The main distribution of this species is a 10 km^2 area around Beeron National Park, approximately 200 km south of the Project Area, as per SPRAT. There is one isolated recorded of this species from 2000 at Dan Dan State Forest, located approximately 15 km south-west of the Project Area. This record is associated with SEVT communities on metamorphic. This species was not identified during ecological field surveys, and suitable habitat, associated with exposed granite ridgelines with scrub (i.e. SEVT) was not identified within the Project Area. Furthermore, the Project Area reaches a maximum of 120 m ASL, therefore suitable habitat is likely located to the south-west of the Project Area, where elevation is above 460 m ASL.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
Arthraxon hispidus	Hairy-joint grass	V	V	The species is found in or on the edges of rainforest and in wet eucalypt forest, often near creeks or swamps, as well as woodland. It has also been recorded growing around freshwater springs on coastal foreshore dunes, in shaded small gullies, on creek banks, on sandy alluvium in creek beds in open forests, and with bog mosses in mound springs.	**Low** – This species has not been recorded within the desktop search extent (Wildlife Online, Atlas of Living Australia). The Project Area is located adjacent to the species known and likely distribution as per SPRAT. Potential suitable habitat it mapped within the Project Area, analogous with REs 11.3.1 and 11.3.25. However, the potential habitat was observed to have high threatening processes, including high infections of exotic grass species. This species was not recorded during ecological field surveys, and due to the degraded state of the microhabitat necessary to support it, the likelihood of its occurrence is reduced.
Bosistoa transversa	Three-leaved bosistoa	V	-	This species grows in lowland subtropical rainforest up to 300 meters above sea level. It is often found on steep slopes with dark organic loam over basalt. Associated species include *Heritiera actinophylla* (White Booyong), *Syzygium moorei* (Smooth-bark Rose Apple), *Endiandra pubens* (Hairy Walnut), and *Dendrocnide excelsa* (Shiny Leaf Stinging Tree). Umwelt also have records that are associated with notophyll or Auracarian dominated vegetation communities.	**Low** – This species has not been recorded within the Project Area or the desktop search extent (Wildlife Online, ALA 2025). The Project Area is located adjacent to the species habitat known and likely distribution as per the SPRAT database. There is no potential suitable habitat (REs analogous with subtropical lowland rainforest) mapped within the Project Area.
Bulbophyllum globuliforme	Miniature moss-orchid	V	NT	The species is host-specific, only growing on the hoop pine, where it colonises the upper branches of mature trees. The hoop pine occurs in upland (usually 100-900 m above sea level) subtropical rainforest communities.	**No** - Atlas of Living Australia records show that this species has been previously recorded in April 2024 at Kroombit Tops National Park, located approximately 17 km south of the Project Area. The exact coordinates of this record has been generalised by 2 km to protect the species. The Project Area is located adjacent to the 'species or species habit likely to occur' range as per the SPRAT.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
					The Project Area reaches a maximum of 120 m ASL. Field investigations identified no suitable habitat within the Project Area, associated with *Araucaria cunninghamii* populations, which is considered a host plant for *B. globuliforme*.
Cadellia pentastylis	Ooline	V	V	This species occurs on a range of vegetation types including semi-evergreen vine thicket, *Acacia harpophylla – Casuarina cristata,* Eucalyptus populnea and *Acacia catenulata* communities at 200 - 500 m ASL. It often occurs on the edges of sandstone and basalt escarpments on moderately fertile soils.	**No** – This species has not been recorded within the desktop search extent (Wildlife Online, Atlas of Living Australia) and the Project Area is located outside of the species' 'may occur' and 'likely to occur' distribution as per SPRAT. Potential suitable habitat, analogous with REs 11.3.2 and 11.12.17 is mapped within the Project Area, however targeted surveys did not detect the presence of this species. Furthermore, the Project Area is located below the altitudinal distribution of the species and the underlying geology does not contain sandstone and basalt derived soils, lowering the likelihood of occurrence.
Cossinia australiana	Cossinia	E	E	The species is known from fragmented relict patches of araucarian vine forests or vine thickets on fertile soils. At most sites it is recorded as uncommon, usually as scattered individuals.	**No** – This species has not been recorded within the Project Area or the search extent, and the closest record is 31 km away within Callide Timber Reserve. The Project Area is located within the species' 'may occur' distribution as per SPRAT. No suitable habitat was identified within the Project Area, analogous with *Araucaria cunninghamii* vine thickets communities, therefore reducing the likelihood of occurrence.
Cupaniopsis shirleyana	Wedge-leaf tuckeroo	V	V	The species occurs in a variety of dry rainforest vegetation types, including vine thicket communities on hillsides, stream beds and along riverbanks at altitudes up to 550 m ASL. This species is also likely to occur on the margins of native vegetation in scrubby urbanised areas. It is	**Low –** This species has not been recorded within the desktop search extent (ALA, WO). The known distribution of this species is limited to approximately 30 km south of Rockhampton as per SPRAT.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
				predominately found on dark brown sandy loams and sandy clay loams (pH 5-7.5) and rocky scree slopes.	Although some suitable habitat may exist within the Project Area analogous with vine thicket communities (RE 11.12.7), these areas are associated with granite hills. Microphyll communities on dark brown sandy loams was not identified within the Project Area, therefore reducing the likelihood of occurrence.
Cycas megacarpa	-	E	E	The species is found in woodland, open woodland and open forests, often in conjunction with a grassy understory. This species is found in habitat dominated by *Eucalyptus crebra* and *Corymbia citriodora* as well as *Corymbia erythrophloia*, *Eucalyptus melanophloia* and *Lophostemon confertus*. There are also reports that it can be found in or on the edge of rainforest habitat. 40–600 m above sea level. (Halford 1995; DEWHA 2008).	**Low** – This species has been previously recorded within the desktop search extent, with multiple contemporary records from 2023, 2020 and 2024 located up to 6 km from the Project Area. The Project Area is located within the species' 'known distribution' as per SPRAT. Based on the initial likelihood of occurrence assessments, this species was targeted as part of the threatened flora surveys in accordance with Cropper (1993) in suitable habitat (RE 11.12.1) mapped throughout the Project Area. This species is easily identifiable and despite targeted surveys, the species was not detected. Given the absence of this species during targeted surveys and the fact that the majority of suitable habitat within the Project Area has been historically cleared and is now in a mature regrowth state, it is considered to have a low likelihood of occurrence due to its slow germination rates.
Cycas ophiolitica	-	E	E	The species occurs on hills and slopes in sparse, grassy open forest at altitude ranges from 80–400 m ASL. It is frequently found on shallow, stony, infertile soils developed on sandstone and serpentinite, and is often associated with species such as *Blakella dallachiana*, *Corymbia*	**No -** This species has not been previously recorded within the desktop search extent (Wildlife Online, Atlas of Living Australia). The Project Area is located within the edge of the species' 'may occur' distribution as per SPRAT.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
				erythrophloia, *Corymbia xanthope* and *Eucalyptus fibrosa*. Climate in the habitat of the species is tropical with hot, humid summers and mild, dry winters.	Although the Project Area occurs within the preferred altitudinal range of the species, no indicator species were recorded throughout the Project Area, and the underlying geology does not contain sandstone and serpentinite. This species is easily identifiable and was not detected during ecological surveys, lowering the likelihood of occurrence.
Dichanthium setosum	Bluegrass	V	LC	The species occurs on heavy soils (predominantly cracking clays or alluvium, often in gilgai) in woodland or open woodland usually dominated by Acacia and/or Eucalyptus species. Associated climate is tropical to subtropical and seasonal, with the habitat drying out for part of the year.	**No** - This species has not been recorded within the desktop search extent (Wildlife Online, Atlas of Living Australia). The Project Area is located within the 'species or species habitat likely to occur' range as per the SPRAT and suitable habitat may occur for this species, analogous with RE 11.3.2 on alluvium; however, there are no records for this species throughout the broader region. The closest record is located approximately 260 km west, near Rolleston. The species is considered unlikely to occur.
Eucalyptus raveretiana	-	V	LC	The species usually grows along watercourses, to a lesser extent river flats or open woodland at 0-300 m ASL in sub-tropical climates. Soil varies from sand to heavy clays. The species does not occur in pure stands, but is co-dominant with species including *Melaleuca leucadendra*, *M. fluviatilis*, *Eucalyptus tereticornis*, *Blakella tessellaris*, and occasionally in semi evergreen vine thicket.	**Low** – This species has not been previously recorded within the desktop search extent (Wildlife Online, Atlas of Living Australia). The Project Area is located on the edge of the species' 'likely to occur' distribution as per SPRAT. The closest record of this species is located further north, approximately 90 km away. Potential suitable habitat, analogous with RE 11.3.25b is mapped within the Project Area; however, despite being easily identifiable from vegetative material, this species was not identified during targeted surveys. Due to the limited records throughout the region, this species has a reduced likelihood of occurrence.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
Fontainea venosa	-	V	V	*Fontainea venosa* occurs in notophyll vine forest and vine thicket with a mean annual rainfall of 1000-1100 mm on soils derived from and containing abundant andesitic rocks, often on rocky outcrops or along creeks.	**No** – This species has not been previously recorded within the desktop search extent (Wildlife Online, Atlas of Living Australia). The Project Area is located within the edge of the species' 'may occur' distribution as per SPRAT. The closest record of this species is from 1985, approximately 50 km south-west of the Project Area. Suitable habitat, analogous with notophyll vine forests and vine thickets were not identified within the Project Area. The bed and banks of watercourses mapped throughout the Project Area were predominately sandy and did not contain rocky outcrops. Furthermore the average annual rainfall for the region is 784 mm (BOM, Station: 39326), therefore reducing the likelihood of occurrence of this species.
Macadamia integrifolia	Macadamia nut	V	V	Occurs in remnant rainforests, preferring areas with high sunlight availability such as clearings and edges. Habitat includes complex notophyll mixed forest, extremely tall, closed forest, simple notophyll mixed very tall closed forest to simple microphyll-notophyll mixed mid-high closed forest with *Araucaria* and *Argyrodendron* emergents.	**No** - This species has not been previously recorded within the desktop search extent (Wildlife Online, Atlas of Living Australia). The Project Area is located outside of the species' 'may occur' and 'likely to occur' distribution as per SPRAT. Suitable habitat, analogous with rainforest communities was not identified within the Project Area. Furthermore, no indicator species were recorded during field surveys. This species has an unlikely likelihood of occurrence.
Leichhardtia brevifolia (syn. Marsdenia brevifolia)	-	V	V	The species grows on serpentine rock outcrops or crumbly black soils derived from serpentine in eucalypt woodland, often with *Eucalyptus fibrosa* and *Corymbia xanthope*	**No** – This species has not been previously recorded within the desktop search extent (Wildlife Online, Atlas of Living Australia). The Project Area is located outside of the species'

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
					'may occur' and 'likely to occur' distribution as per the SPRAT. Records for this species occur near Rockhampton and Marlborough and suitable habitat associated with eucalypt woodlands of *E. fibrosa* and *C. xanthope* with underlying serpentine geology was not identified within the Project Area, reducing the likelihood of occurrence of this species.
Parsonsia larcomensis	Mt Larcom silk pod	V	V	The species is found between 350 m and 750 m AHD (Australian Height Datum) in open heathland and shrubland at or near the summits of mountain peaks in shallow, loamy soils on cliffs or among outcrops of acid volcanic rocks and serpentinites.	**No**- This species has not been previously recorded within the desktop search extent (Wildlife Online, Atlas of Living Australia). The Project Area is located outside of the species known and likely distribution as per the SPRAT. Records for this species in the region are restricted to Mount Larcom (632 m ASL), located approximately 35 km north-east of the Project Area. The Project Area reaches a maximum of 120 m ASL and does not support suitable habitat for the species, analogous with shrublands and heathlands.
Polianthion minutiflorum	-	V	V	Occurs in forest and woodland on sandstone slopes and gullies with skeletal soil, or sometimes deeper sands adjacent to deeply weathered laterite. Associated species and vegetation includes: open woodland of *Acacia shirleyi, Lysicarpus angustifolius, Corymbia aureola*; woodland of *Eucalyptus corynodes, Corymbia trachyphloia, E. cloeziana* on sandy soil over sandstone.; sandstone plateau with *Eucalyptus dura, E. fibrosa, Angophora leiocarpa, E. major*.	**No** - This species has not been previously recorded within the desktop search extent (Wildlife Online, Atlas of Living Australia). The Project Area is located outside of the species' 'may occur' and 'likely to occur' distribution as per the SPRAT. The Project Area contained limited suitable habitat to support the species, associated with sandstone and lateritic communities (Land Zone 7). Furthermore, no indicator species were recorded throughout the Project Area during ecological field surveys. This species has an unlikely likelihood of occurrence.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
Rhaponticum australe	Austral cornflower	V	V	The species occurs in woodland and grassland and in association with *Eucalyptus crebra, E. orgadophila, E. populnea, E. tereticornis, E. melanophloia, Angophora subvelutina, A. floribunda, Cirsium vulgare, Dichanthium sericeum* and *Themeda triandra*. Populations are often confined to roadsides and cultivation headlands. It usually grows on heavy black or red-brown clay, or clay loams derived from basalt.	**Low** – This species has not been previously recorded within the desktop search extent (Wildlife Online, Atlas of Living Australia). The Project Area is located outside of the species' 'may occur' and 'likely to occur' distribution as per the SPRAT. The closest record for this species is located near Monto and Coominglah State Forest, located approximately 80 km south-west from the Project Area. Associated species, including *E. populnea, E. crebra* and *E. tereticornis* were identified throughout the Project Area, however the underlying geology does not contain basalt derived soils (Land Zone 8). Due to the limited number of records throughout the broader landscape, this species has a reduced likelihood of occurrence.
Samadera bidwillii	Quassia	V	V	The species occurs in lowland rainforest or on rainforest margins, but it can also be found in other forest types, such as open forest and woodland. It is commonly found in areas adjacent to both temporary and permanent watercourses in locations up to 510 m altitude. The species occurs on lithosols, skeletal soils, loam soils, sands, silts and sands with clay subsoils.	**No** – This species has not been previously recorded within the desktop search extent (Wildlife Online, Atlas of Living Australia). The Project Area is located within the species' 'may occur' distribution as per the SPRAT. The closest records are located approximately 25 km west, within Callide Timber Reserve, which are associated with vine thicket communities (RE 11.10.8 and eucalyptus woodlands (RE 11.10.13). Field surveys confirmed no suitable habitat, analogues with lowland rainforests occur within the Project Area. This species has low likelihood of occurrence.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
Sophora fraseri	-	V	V	The species grows in moist habitats, often in hilly terrain at altitudes from 60–660 m on shallow soils along rainforest margins in eucalypt forests or in large canopy gaps in closed forest communities.	**No** - This species has not been previously recorded within the desktop search extent (Wildlife Online, Atlas of Living Australia). The Project Area is located outside of the species known and likely distribution as per SPRAT. The field investigations confirmed that no suitable habitat, analogous with rainforest and wet sclerophyll forests were identified within the Project Area.
Threatened Ecological Communities					
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland		E	-	This TEC occurs in coastal catchments, mostly at elevations of less than 20 m AHD which are typically found within 30 km of the coast. It is found on Quaternary age unconsolidated sediments, including alluvium. The forest to woodland community is dominated by *Casuarina glauca* (swamp oak) with a lower canopy layer of smaller swamp oak and other species including *Melaleuca spp*. or *Eucalyptus spp*. The following REs form part of, or align with this TEC: RE 12.1.1, 12.3.2.	**No** – The REs that are associated with this TEC do not occur within the same bioregion as the Project Area.
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community		E	-	This ecological community occurs in coastal catchments, mostly at elevations of less than 20 m ASL that are typically found within 30 km of the coast. Coastal Swamp Oak Forest is often found in association with other vegetation types such as coastal saltmarsh, mangroves, freshwater wetlands, littoral rainforests or swamp sclerophyll forests in a 'mosaic' of coastal floodplain communities. The following REs form part of, or align with this TEC: 12.1.1 and 11.12.20	**No** – No REs analogous to this community have been identified within the Project Area, including within State RE mapping and ground-truthed RE mapping.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions		E	-	The community is a semi-arid to humid subtropical woodland where *Eucalyptus coolabah subsp. coolabah* and/or *Eucalyptus largiflorens* are the dominant canopy species. Structure may vary from tall woodland in riparian zones to very open woodland with a sparse mid layer of shrubs and a grassy ground layer. It is found on the grey, self-mulching clays of periodically waterlogged floodplains, swamp margins, ephemeral wetlands, and stream levees. It occurs in areas where annual rainfall is ~250 -700 mm. The following REs form part of, or align with this TEC: RE 11.3.3, 11.3.15, 11.3.16, 11.3.28 and 11.3.37.	**No** – No REs analogous to this community have been identified within the Project Area, including within State RE mapping and ground-truthed RE mapping. Furthermore, the Project Area is located within the Brigalow Belt Northern Bioregion, which is outside of the boundary of this TEC.
Lowland Rainforest of Subtropical Australia		CE	-	The community is generally a moderately tall to tall closed forest. The upper, discontinuous layer includes canopy emergent. Tree species with compound notophyll to mesophyll leaves are common and there is typically a relatively low abundance of Eucalyptus, Melaleuca and Casuarina species. It occurs on basalt and alluvial soils, including sand and old/elevated alluvial soils as well as floodplain alluvia, and occasionally on historically enriched rhyolitic soils and basaltically enriched metasediments. The following REs form part of, or align with this TEC: RE 12.3.1, 12.5.13, 12.8.3, 12.8.4, 12.8.13, 12.11.1, 12.11.10, 12.12.1 and 12.12.16.	**No** – No REs analogous to this community have been identified within the Project Area, including within State RE mapping and ground-truthed RE mapping.
Poplar Box Grassy Woodland on Alluvial Plains		E	-	The community is typically a grassy woodland with a canopy dominated by *Eucalyptus populnea* and understorey mostly of grasses and other herbs. The community mostly occurs in gently undulating to flat landscapes and occasionally on gentle slopes on a wide range of soil types of alluvial and depositional origins. The community may include	**Known** – Four patches of vegetation within the Project Area contain RE 11.3.2 and meet the key diagnostic and condition thresholds for the Poplar Box Grassy Woodlands TEC.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
				a low density of shrubs. Since the community is typically located on alluvial plains, it experiences occasional inundation and cyclic changes in understorey density. The following REs form part of, or align with this TEC: RE 11.3.2, 11.3.17, 11.4.7, 11.4.12 and 12.3.10.	
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions		E	-	Semi-evergreen vine thicket is considered an extreme form of dry seasonal subtropical rainforest, occurring in areas with a subtropical, seasonally dry climate on soils of high to medium fertility. It is generally characterised by the prominence of trees with microphyll sized leaves (2.5–7.5cm long) and the frequent presence of Brachychiton australis/B. rupestris as emergent. Corresponding REs in the Brigalow Belt Bioregion include: 11.2.3, 11.3.11, 11.4.1, 11.5.15, 11.8.3, 11.8.6, 11.8.13, 11.9.4, 11.9.8, 11.11.18. There are no key diagnostic or condition threshold criteria for this TEC.	**No** – No REs analogous to this community have been identified within the Project Area, including within State RE mapping and ground-truthed RE mapping.
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions		E	-	The ecological community is found on alluvial landforms, including floodplains, the riparian zones of parent rivers and other order tributaries, alluvial flats, floodplain/alluvial terraces and periodically flooded depressions. It generally occurs below 50 m ASL. The tree canopy is dominated by *Eucalyptus* and/ or *Angophora, Corymbia, Lophostemon* and *Syncarpia* genera). The following Res for part of, or align with this TEC: 12.3.3, 12.3.3a, 12.3.3d, 12.3.19, 12.3.20, 12.3.10, 12.3.18	**No** – No REs analogous to this community have been identified within the Project Area, including within State RE mapping and ground-truthed RE mapping.

Scientific Name	Common name	EPBC Act Status[1]	NC Act Status[1]	Preferred Habitat[2]	Likelihood of Occurrence (Potential to Occur)
Weeping Myall Woodlands		E	-	The community ranges from open woodland to woodland, generally 4-12 m high. The overstorey is dominated by Acacia *pendula*. Other species including *Alectryon oleifolius subsp. elongatus*, *Eucalyptus populnea* or *Eucalyptus largiflorens* may form part of the overstorey. The understorey often includes an open layer of shrubs over a ground layer which includes a diversity of grasses and forbs. The following REs form part of, or align with this TEC: RE 11.3.2, 11.3.28.	**No** – Although RE 11.3.2 has been mapped within the Project Area, this community did not meet the key diagnostic criteria and condition thresholds for the Weeping Myall TEC. No Acacia pendula was observed within this RE.

Appendix C

Species Lists

Flora Species List

Family	Scientific Name	Common name	NC Act Status	EPBC Act Status
Acanthaceae	*Rostellularia adscendens*	-	C	-
Aizoaceae	*Tetragonia tetragonoides*	New Zealand spinach	C	-
Amaranthaceae	*Gomphrena celosioides**	Gomphrena weed	-	-
	Alternanthera nana	Hairy joyweed	C	-
	Achyranthes aspera	-	C	-
	Nyssanthes erecta	-	C	-
	*Amaranthus viridis**	Green amaranth	-	-
Amaryllidaceae	*Crinum flaccidum*	Murray lily	SL	-
Apocynaceae	*Cryptostegia grandiflora**	Rubber vine	-	-
	Parsonsia lanceolata	Northern silkpod	C	-
	*Gomphocarpus fruticosus**	Narrow-leaved cotton bush	-	-
	Carissa ovata	Currantbush	C	-
	Alstonia constricta	Bitterbark	C	-
Araceae	*Spirodela polyrhiza*	Large duckweed	C	-
Aristolochiaceae	*Aristolochia elegans**	Calico-flower	-	-
Asteraceae	*Cyanthillium cinereum*	-	C	-
	Pterocaulon ciliosum	-	C	-
	Calotis cuneifolia	Burr daisy	C	-
	Glossocardia bidens	Native cobbler's pegs	C	-
	Centipeda minima	-	C	-
	Pterocaulon redolens	-	C	-
	*Praxelis clematidea**	-	-	-
	*Calyptocarpus vialis**	Creeping cinderella weed	-	-
	*Bidens pilosa**	-	-	-
	*Erigeron bonariensis**	-	-	-
	Sigesbeckia orientalis	Indian weed	C	-
	*Tridax procumbens**	Tridax daisy	-	-
	Chrysocephalum apiculatum	Yellow buttons	C	-
	*Emilia sonchifolia var. javanica**	-	-	-
	*Xanthium spinosum**	Bathurst burr	-	-
	*Xanthium occidentale**	-	-	-
	*Ageratum conyzoides subsp. conyzoides**	-	-	-
	*Synedrella nodiflora**	-	-	-
Bignoniaceae	*Pandorea pandorana*	Wonga vine	C	-
Boraginaceae	*Ehretia membranifolia*	Weeping koda	C	-

Family	Scientific Name	Common name	NC Act Status	EPBC Act Status
Cactaceae	*Opuntia stricta**	-	-	-
	*Opuntia tomentosa**	Velvety tree pear	-	-
Campanulaceae	*Wahlenbergia gracilis*	Sprawling bluebell	SL	-
Capparaceae	*Capparis anomala*	-	C	-
	Capparis canescens	-	C	-
	Capparis lasiantha	Nipan	C	-
Casuarinaceae	*Casuarina cunninghamiana subsp. cunninghamiana*	-	C	-
	Casuarina cunninghamiana	-	C	-
	Casuarina cristata	Belah	C	-
	Allocasuarina luehmannii	Bull oak	C	-
Chenopodiaceae	*Enchylaena tomentosa*	-	C	-
	Maireana microphylla	-	C	-
	Sclerolaena birchii	Galvanised burr	C	-
Commelinaceae	*Murdannia graminea*	Murdannia	C	-
	Commelina lanceolata	-	C	-
	Commelina diffusa	-	C	-
Convolvulaceae	*Evolvulus alsinoides*	-	C	-
Cupressaceae	*Callitris glaucophylla*	White cypress pine	C	-
Cyperaceae	*Cyperus gracilis*	-	C	-
	Fimbristylis dichotoma	Common fringe-rush	C	-
	Bulbostylis barbata	-	C	-
	Carex inversa	Knob sedge	C	-
	Cyperus fulvus	-	C	-
	Cyperus flavidus	-	C	-
	Gahnia aspera	-	C	-
	Scleria mackaviensis	-	C	-
	Eleocharis plana	Ribbed spikerush	C	-
Ebenaceae	*Diospyros humilis*	Small-leaved ebony	C	-
Euphorbiaceae	*Mallotus philippensis*	Red kamala	C	-
	Croton insularis	Queensland cascarilla	C	-
	Acalypha eremorum	Soft acalypha	C	-
	Euphorbia mitchelliana	-	C	-
	*Euphorbia heterophylla**	-	-	-
	*Euphorbia hyssopifolia**	-	-	-
Goodeniaceae	*Goodenia rotundifolia*	-	C	-
	Goodenia racemosa	-	C	-
Johnsoniaceae	*Tricoryne elatior*	Yellow autumn lily	C	-
Juncaceae	*Juncus sp.*	-	C	-

Family	Scientific Name	Common name	NC Act Status	EPBC Act Status
Lamiaceae	*Teucrium junceum*	-	C	-
Laxmanniaceae	*Eustrephus latifolius*	Wombat berry	C	-
Leguminosae	*Mimosa pudica**	-	-	-
	Aeschynomene indica	Budda pea	C	-
	Vachellia bidwillii	-	C	-
	Rhynchosia minima	-	C	-
	Desmodium filiforme	-	C	-
	Acacia salicina	Doolan	C	-
	Desmodium rhytidophyllum	-	C	-
	Erythrina vespertilio	-	C	-
	Acacia rhodoxylon	Ringy rosewood	C	-
	Lysiphyllum hookeri	Queensland ebony	C	-
	Glycine tomentella	Woolly glycine	C	-
	Indigofera polygaloides	-	C	-
	Galactia tenuiflora	-	C	-
	*Chamaecrista rotundifolia**	-	-	-
	Acacia disparrima	-	C	-
	Sesbania cannabina	-	C	-
	*Senna occidentalis**	Coffee senna	-	-
	Neptunia gracilis	-	C	-
Malvaceae	*Sida cordifolia**	-	-	-
	Hibiscus sturtii	-	C	-
	Abutilon oxycarpum	-	C	-
	Sida hackettiana	-	C	-
	Sida trichopoda	-	C	-
	*Urena lobata**	Urena weed	-	-
Meliaceae	*Melia azedarach*	White cedar	C	-
	Owenia venosa	Crow's apple	C	-
Menispermaceae	*Stephania japonica*	-	C	-
Moraceae	*Ficus macrophylla*	-	C	-
	Ficus coronata	Creek sandpaper fig	C	-
Myrtaceae	*Eucalyptus populnea*	Poplar box	C	-
	Eucalyptus crebra	Narrow-leaved red ironbark	C	-
	Eucalyptus tereticornis	-	C	-
	Corymbia clarksoniana	-	C	-
	Melaleuca fluviatilis	-	C	-
	Blakella tessellaris	Moreton Bay ash	C	-
	Melaleuca bracteata	-	C	-

Family	Scientific Name	Common name	NC Act Status	EPBC Act Status
	Eucalyptus melanophloia	-	C	-
	Corymbia erythrophloia	Variable-barked bloodwood	C	-
	Eucalyptus moluccana	Gum-topped box	C	-
	Angophora leiocarpa	Rusty gum	C	-
	Lophostemon suaveolens	Swamp box	C	-
	Melaleuca viridiflora	-	C	-
Nyctaginaceae	*Boerhavia dominii*	-	C	-
Oleaceae	*Jasminum didymum*	-	C	-
	Notelaea microcarpa	-	C	-
Orchidaceae	*Cymbidium canaliculatum*	-	SL	-
Oxalidaceae	*Oxalis corniculata**	-	-	-
Passifloraceae	*Passiflora foetida**	-	-	-
Petiveriaceae	*Rivina humilis**	-	-	-
Phyllanthaceae	*Phyllanthus virgatus*	-	C	-
	Phyllanthus dallachyanus	-	C	-
	Breynia oblongifolia	-	C	-
Picrodendraceae	*Petalostigma pubescens*	Quinine tree	C	-
Pittosporaceae	*Bursaria incana*	-	C	-
	Pittosporum spinescens	-	C	-
	Auranticarpa rhombifolia	-	C	-
Poaceae	*Chloris inflata**	Purpletop chloris	-	-
	Chloris divaricata	-	C	-
	Sporobolus caroli	Fairy grass	C	-
	Panicum effusum	-	C	-
	Paspalidium distans	Shotgrass	C	-
	Eriochloa crebra	Spring grass	C	-
	Enteropogon acicularis	Curly windmill grass	C	-
	Chloris ventricosa	Tall chloris	C	-
	Cymbopogon refractus	Barbed-wire grass	C	-
	Eragrostis brownii	Brown's lovegrass	C	-
	Themeda triandra	Kangaroo grass	C	-
	Dichanthium sericeum	-	C	-
	Chrysopogon fallax	-	C	-
	Aristida gracilipes	-	C	-
	Dinebra decipiens	-	C	-
	Panicum queenslandicum	-	C	-
	*Chloris gayana**	Rhodes grass	-	-
	Sporobolus creber	-	C	-
	Eremochloa bimaculata	Poverty grass	C	-

Family	Scientific Name	Common name	NC Act Status	EPBC Act Status
	Tragus australianus	Small burr grass	C	-
	*Megathyrsus maximus**	-	-	-
	Heteropogon contortus	Black speargrass	C	-
	Aristida calycina	-	C	-
	Bothriochloa bladhii	-	C	-
	Enneapogon gracilis	Slender nineawn	C	-
	*Bothriochloa pertusa**	-	-	-
	*Urochloa mosambicensis**	Sabi grass	-	-
	Eragrostis leptostachya	-	C	-
	*Digitaria ciliaris**	Summer grass	-	-
	*Chloris virgata**	Feathertop rhodes grass	-	-
	Aristida latifolia	Feathertop wiregrass	C	-
	*Eragrostis curvula**	-	-	-
	*Eragrostis trichophora**	-	-	-
	Eragrostis sororia	-	C	-
	Enneapogon virens	-	C	-
	Digitaria ammophila	Silky umbrella grass	C	-
	*Melinis repens**	Red natal grass	-	-
	*Cenchrus ciliaris**	-	-	-
	Arundinella nepalensis	Reedgrass	C	-
	Aristida caput-medusae	-	C	-
	Paspalidium caespitosum	Brigalow grass	C	-
	Ancistrachne uncinulata	Hooky grass	C	-
	Eragrostis lacunaria	Purple lovegrass	C	-
	Dactyloctenium radulans	Button grass	C	-
	*Panicum coloratum**	-	-	-
	Thyridolepis mitchelliana	Mulga mitchell grass	C	-
	Austrostipa ramosissima	Bamboo grass	C	-
	Eriachne humilis	-	C	-
	Austrostipa verticillata	Slender bamboo grass	C	-
	*Paspalum notatum**	Bahia grass	-	-
	*Urochloa decumbens**	-	-	-
	Sporobolus australasicus	-	C	-
	*Cynodon dactylon**	-	-	-
	*Hyparrhenia rufa**	-	-	-
	Eragrostis parviflora	Weeping lovegrass	C	-
	Perotis rara	Comet grass	C	-
	Cymbopogon bombycinus	Silky oilgrass	C	-
	Eleusine indica	Crowsfoot grass	-	-
	Alloteropsis semialata	Cockatoo grass	C	-

Family	Scientific Name	Common name	NC Act Status	EPBC Act Status
	*Urochloa panicoides var. panicoides**	-	-	-
Poaceae	*Eragrostis sp.*	-	C	-
Portulacaceae	*Portulaca pilosa**	-	-	-
Proteaceae	*Grevillea striata*	Beefwood	C	-
	Hakea lorea	-	C	-
Pteridaceae	*Cheilanthes distans*	Bristly cloak fern	C	-
	Cheilanthes sieberi subsp. sieberi	-	C	-
	Cheilanthes sieberi	-	C	-
Rhamnaceae	*Alphitonia excelsa*	Soap tree	C	-
Rubiaceae	*Spermacoce brachystema*	-	C	-
	Nauclea orientalis	Leichhardt tree	C	-
	Psydrax odorata	-	C	-
	Psydrax attenuata	-	C	-
	Everistia vacciniifolia	-	C	-
Rutaceae	*Geijera parviflora*	Wilga	C	-
	Philotheca difformis	-	C	-
	Flindersia collina	Broad-leaved leopard tree	C	-
	Flindersia sp.	-	C	-
Santalaceae	*Exocarpos latifolius*	-	C	-
Sapindaceae	*Atalaya hemiglauca*	-	C	-
	Jagera pseudorhus	-	C	-
	Alectryon diversifolius	Scrub boonaree	C	-
Sapotaceae	*Planchonella cotinifolia*	-	C	-
Scrophulariaceae	*Eremophila debilis*	Winter apple	C	-
	Eremophila deserti	-	C	-
	Eremophila mitchellii	-	C	-
Solanaceae	*Solanum torvum**	Devil's fig	-	-
Sparrmanniaceae	*Grewia latifolia*	Dysentery plant	C	-
Sterculiaceae	*Brachychiton rupestris*	-	SL	-
Verbenaceae	*Lantana camara**	Lantana	-	-
	*Glandularia aristigera**	-	-	-
	*Lantana montevidensis**	Creeping lantana	-	-
	*Verbena litoralis**	Verbena	-	-

Fauna Species List

Class	Scientific name	Common name	NC Act Status	EPBC Act Status
amphibians	*Rhinella marina**	Cane toad	-	-
	Litoria caerulea	Common green treefrog	C	-
	Limnodynastes tasmaniensis	Spotted grassfrog	C	-
	Litoria nasuta	Striped rocketfrog	C	-
birds	*Tachybaptus novaehollandiae*	Australasian grebe	C	-
	Anthus novaeseelandiae	Australasian pipit	C	-
	Ardeotis australis	Australian bustard	C	-
	Chenonetta jubata	Australian wood duck	C	-
	Geopelia humeralis	Bar-shouldered dove	C	-
	Milvus migrans	Black kite	C	-
	Coracina novaehollandiae	Black-faced cuckoo-shrike	C	-
	Entomyzon cyanotis	Blue-faced honeyeater	C	-
	Dacelo leachii	Blue-winged kookaburra	C	-
	Antigone rubicunda	Brolga	C	-
	Falco berigora	Brown falcon	C	-
	Cacomantis variolosus	Brush cuckoo	C	-
	Scythrops novaehollandiae	Channel-billed cuckoo	C	-
	Edolisoma tenuirostre	Common cicadabird Birds	C	-
	Eurystomus orientalis	Dollarbird	C	-
	Taeniopygia bichenovii	Double-barred finch	C	-
	Dromaius novaehollandiae	Emu	C	-
	Petrochelidon ariel	Fairy martin	C	-
	Cacomantis flabelliformis	Fan-tailed cuckoo	C	-
	Todiramphus macleayii	Forest kingfisher	C	-
	Eolophus roseicapilla	Galah	C	-
	Cisticola exilis	Golden-headed cisticola	C	-
	Anas gracilis	Grey teal	C	-
	Mirafra javanica	Horsfield's bushlark	C	-
	Dacelo novaeguineae	Laughing kookaburra	C	-
	Myiagra rubecula	Leaden flycatcher	C	-
	Meliphaga lewinii	Lewin's honeyeater	C	-
	Egretta garzetta	Little egret	C	-
	Philemon citreogularis	Little friarbird	C	-
	Artamus personatus	Masked woodswallow	C	-
	Philemon corniculatus	Noisy friarbird	C	-
	Anas superciliosa	Pacific black duck	C	-

Class	Scientific name	Common name	NC Act Status	EPBC Act Status
	Platycercus adscitus	Pale-headed rosella	C	-
	Geopelia placida	Peaceful dove	C	-
	Centropus phasianinus	Pheasant coucal	C	-
	Dendrocygna eytoni	Plumed whistling-duck	C	-
	Merops ornatus	Rainbow bee-eater	C	-
	Trichoglossus moluccanus	Rainbow lorikeet	C	-
	Malurus melanocephalus	Red-backed fairy-wren	C	-
	Aprosmictus erythropterus	Red-winged parrot	C	-
	Rhipidura rufifrons	Rufous fantail	C	-
	Pachycephala ru5ntris	Rufous whistler	C	-
	Todiramphus sanctus	Sacred kingfisher	C	-
	Dicrurus bracteatus	Spangled drongo	C	-
	Geophaps scripta scripta	Squatter pigeon (southern subspecies)	V	V
	Threskiornis spinicollis	Straw-necked ibis	C	-
	Pardalotus striatus	Striated pardalote	C	-
	Podargus strigoides	Tawny frogmouth	C	-
	Aquila audax	Wedge-tailed eagle	C	-
	Smicrornis brevirostris	Weebill	C	-
	Haliastur sphenurus	Whistling kite	C	-
	Coracina papuensis	White-bellied cuckoo-shrike	C	-
	Egretta novaehollandiae	White-faced heron	C	-
	Ardea pacifica	White-necked heron	C	-
	Gerygone olivacea	White-throated gerygone	C	-
	Melithreptus albogularis	White-throated honeyeater	C	-
	Rhipidura leucophrys	Willie wagtail	C	-
	Manorina flavigula	Yellow-throated miner	C	-
mammals	*Pteropus alecto*	Black flying-fox	C	-
	*Felis catus**	Cat	-	-
	Chalinolobus morio	Chocolate wattled bat	C	-
	Trichosurus vulpecula	Common brushtail possum	C	-
	Canis familiaris	Dingo	C	-
	Macropus giganteus	Eastern grey kangaroo	C	-
	*Lepus europaeus**	European brown hare	-	-
	Chalinolobus gouldii	Gould's wattled bat	C	-
	Chalinolobus nigrogriseus	Hoary wattled bat	C	-
	Scotorepens balstoni	Inland broad-nosed bat	C	-
	Miniopterus orianae oceanensis	Australasian bent-wing bat	C	-
	Miniopterus australis	Little bent-wing bat	C	-

Class	Scientific name	Common name	NC Act Status	EPBC Act Status
	Scotorepens greyii	Little broad-nosed bat	C	-
	Chalinolobus picatus	Little pied bat	C	-
	Pteropus scapulatus	Little red flying-fox	C	-
	Nyctophilus sp.	Vesper bats	C	-
	Scotorepens sanborni	Northern broad-nosed bat	C	-
	Chaerephon jobensis	Northern freetail bat	C	-
	*Sus scrofa**	Pig	-	-
	*Oryctolagus cuniculus**	Rabbit	-	-
	Ozimops ridei	Eastern free-tailed bat	C	-
	Aepyprymnus rufescens	Rufous bettong	C	-
	Myotis macropus	Southern myotis	C	-
	Notamacropus parryi	Whiptail wallaby	C	-
	Austronomus australis	White-striped free-tailed bat	C	-
	Saccolaimus flaviventris	Yellow-bellied sheathtail bat	C	-
reptiles	*Pogona barbata*	Bearded dragon	C	-
	Demansia vestigiata	Lesser black whipsnake	C	-
	Cryptoblepharus virgatus	Striped snake-eyed skink	C	-
	Diporiphora australis	Tommy roundhead	C	-

Appendix D

Threatened and Special Least Concern Species Habitat Modelling Rules



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Threatened Species Habitat Mapping Rules

Species	Likelihood of Occurrence	Modelling Criteria	Habitat Requirements	Suitable Habitat within the Project Area	REs
Threatened Fauna					
squatter pigeon (southern) *Geophaps scripta scripta*	Known	Foraging and breeding	Any remnant or regrowth open-forest to sparse, open-woodland or scrub dominated by Eucalyptus, Corymbia, Acacia or Callitris species, on sandy or gravelly soils with patchy perennial tussock grasses or a mix of perennial tussock grasses and low shrubs and forbs (including but not limited to areas mapped as Queensland land zones 3, 5 or 7) and within 1 km of a permanent or seasonal waterbody with gently sloping banks.	Remnant and regrowth vegetation occurring on land zones 3 (no land zones 5 or 7 present within the Project Area) and 12 (given the presence of the subspecies on land zone 12 within the Project Area where microhabitat is available), within 1 km of a suitable water source (i.e. farm dams, lacustrine wetlands and watercourses with a stream order of 3 or higher).	All remnant and regrowth REs on a land zone 12 and 3 within 1 km of suitable water sources
		Foraging	Any remnant or regrowth open-forest to sparse, open-woodland or scrub dominated by Eucalyptus, Corymbia, Acacia or Callitris species, on sandy or gravelly soils with patchy perennial tussock grasses or a mix of perennial tussock grasses and low shrubs and forbs (including but not limited to areas mapped as Queensland land zones 3, 5 or 7) and within 3 km of a permanent or seasonal waterbody with gently sloping banks (i.e. farm dams, lacustrine wetlands and watercourses with a stream order of 2 or higher).	Remnant and regrowth vegetation occurring on land zones 3 (no land zone 5 or 7 present within the Project Area) and land zone 12 (given presence of the subspecies on land zone 12 within the Project Area where microhabitat is available), within 3 km of a suitable water source (i.e. farm dams, lacustrine wetlands and watercourses with a stream order of 3 or higher).	All remnant and regrowth REs on a land zone 12 and 3 within 3 km of a suitable water source
		Dispersal	Any forest or woodland occurring between patches of foraging or breeding habitat that facilitates movement between patches of foraging habitat, breeding habitat and/or waterbodies, and areas of cleared land	Remnant and regrowth vegetation, and non-remnant areas with emergent paddock trees providing sufficient cover occurring between patches of foraging and breeding habitat and water sources. Also includes areas of cleared land less than 100 m wide linking foraging and	Remnant, regrowth and non-remnant vegetation

Species	Likelihood of Occurrence	Modelling Criteria	Habitat Requirements	Suitable Habitat within the Project Area	REs
			less than 100 m wide linking areas of suitable breeding and/or foraging habitat.	/or breeding habitat. Also includes cleared areas within 50 m of a watercourse (stream order 3 and above) or waterbody except where a waterbody is isolated by more than 100 m.	
white-throated needletail *Hirundapus caudacutus*	Moderate	Foraging and roosting	Forests and woodlands with tall trees, dense foliage or hollows which provide a roosting opportunity.	All areas of vegetation communities which have a dense or mid-dense structural category (none present) or which contained trees that met the DBH threshold for large trees in the BioCondition benchmark (i.e. trees which are expected to bear hollows).	Remnant REs 11.12.1, 11.12.17, 11.3.2, 11.3.25b, 11.3.4, 11.3.4a
		Dispersal and marginal foraging	A range of habitats, although more often over wooded areas, where it is almost exclusively aerial.	A range of habitats, although more often over wooded areas, where it is almost exclusively aerial.	All remaining habitat within the Project Area that is not characterised as roosting and foraging habitat for white-throated needletail.
yakka skink *Egernia rugosa*	Moderate	Suitable habitat	Dry forests and woodlands, usually on well-drained, gritty soils, including Eucalyptus populnea, Callitris glaucophylla, Acacia harpophylla on alluvial soils and sands, Allocasuarina luehmannii, Acacia harpophylla, A. catenulata and A. aneura on sands.	All remnant and regrowth RE 11.3.2 (*E. populnea* dominant) which supports soils suitable for burrowing. Within these RE 11.3.2 patches, the ground-layer microhabitat has been ground-verified as containing logs, stumps or other denning features.	All remnant and regrowth RE 11.3.2
koala *Phascolarctos cinereus*	Moderate	Climate refugia	Forests or woodlands on drainage lines or riparian zones that are resilient to drying conditions, likely to provide a cooler refuge during periods of bushfire and heatwaves.	Riverine forest and woodland communities which occur along mapped watercourses and drainage features. These areas are characterised by remnant or regrowth condition RE 11.3.25b.	Remnant and regrowth 11.3.25b
		Breeding and foraging	Any forest or woodland that contains Locally Important Koala Trees (LIKT) and is not climate refugia.	Remnant and regrowth forests and woodlands that are not climate refugia which contain LIKTs including REs 11.12.1, 11.12.17, 11.12.3, 11.12.7, 11.3.2, 11.3.4.	Remnant and regrowth REs 11.12.1, 11.12.17, 11.12.3,

Species	Likelihood of Occurrence	Modelling Criteria	Habitat Requirements	Suitable Habitat within the Project Area	REs
					11.12.7, 11.3.2, 11.3.25b, 11.3.4
		Shelter	Any forest or woodland community which does not contain LIKTs and may or may not contain ancillary habitat trees.	Remaining forest and woodland communities which do not support climate refugia or breeding and foraging habitat. Includes remnant REs 11.3.25d and 11.3.4a.	Remnant and regrowth REs 11.3.25d and 11.3.4a
		Dispersal (with trees)	Grasslands and shrublands that support scattered trees and provide a safe intervening ground (with opportunities for predatory avoidance) for the species to move across the landscape, particularly to and from areas of potential climate refugia or breeding and foraging habitat.	Grasslands and shrublands that support scattered trees and provide a safe intervening ground (with opportunities for predatory avoidance) for the species to move across the landscape, particularly to and from areas of potential climate refugia or breeding and foraging habitat. This includes non-remnant vegetation with scattered occurrences of eucalypt paddock trees.	Non remnant vegetation
		Dispersal (without trees)	Grasslands, shrublands and cleared areas that may be opportunistically used to move across the landscape.	Non-remnant areas without scattered occurrences of eucalypt trees. Includes all remaining non-remnant areas within the Project Area including roads and other infrastructure. Excludes waterbodies.	Non-remnant vegetation
southern greater glider *Petauroides volans*	Moderate	Likely or current denning	Eucalypt forests and woodlands in Queensland REs considered habitat or potential habitat as per the *Species Specific Guidance – Greater Glider habitats in Queensland* (DES, 2022) containing appropriate tree species with a diameter at breast height greater than the RE threshold for large trees.	All areas of the following remnant REs which contained trees that met the DBH threshold for large trees in the BioCondition benchmark: REs 11.12.1, 11.3.2, 11.3.4 and 11.3.4a.	Remnant REs 11.12.1, 11.3.2, 11.3.4 and 11.3.4a
		Potential or future denning	Eucalypt forest and woodlands in Queensland REs considered habitat or potential habitat as per the *Species Specific Guidance – Greater Glider habitats*	All areas of the following regrowth REs which contained trees that had a DBH of 30 cm or greater but less than the DBH threshold for large trees in the BioCondition benchmark	Regrowth REs 11.3.2 11.3.4, 11.12.1 and 11.3.4a

Species	Likelihood of Occurrence	Modelling Criteria	Habitat Requirements	Suitable Habitat within the Project Area	REs
			in Queensland (DES, 2022) containing appropriate tree species with a diameter at breast height greater than 30 cm, but less than the RE threshold for large trees.	including REs 11.3.2, 11.12.1, 11.3.4 and 11.3.4a.	
		Foraging and dispersal	Eucalypt forest and woodlands where locally important tree species for foraging are dominant/co-dominant AND in Queensland REs considered habitat or potential habitat as per the *Species Specific Guidance – Greater Glider habitats in Queensland* (DES, 2022).	All areas of the following remnant and regrowth REs where trees present did not have a DBH greater than 30 cm and/or did not meet the DBH threshold for large trees in the BioCondition benchmark including REs 11.12.17, 11.12.3 and 11.12.7.	Remnant and regrowth REs 11.12.3, 11.12.17 and 11.12.7
grey-headed flying-fox *Pteropus poliocephalus*	Moderate	Foraging and dispersal	Any vegetation communities which contains important Winter/Spring flowering species (*Eucalyptus tereticornis, E. albens, E. crebra, E. fibrosa, E. melliodora, E. paniculata,*	The Project Area occurs within 28 km of a known grey-headed flying-fox camp. REs listed below in remnant and regrowth condition were ground-truthed as containing important Winter/Spring flowering species: REs 11.12.17, 11.3.4, 11.12.7, 11.3.2, 11.12.1, 11.12.3	Remnant and regrowth REs 11.12.17, 11.3.4, 11.12.7, 11.3.2, 11.12.1, 11.12.3
		Roosting	*E. pilularis, E. robusta, E. seeana, E. sideroxylon, E. siderophloia, Banksia integrifolia, Castanospermum australe, Corymbia citriodora citriodora, C. eximia, C. maculata, Grevillea robusta, Melaleuca quinquenervia* or *Syncarpia glomulifera*) (as defined in the National Recovery Plan) within 40 km of known camps "	No camps (based on DCCEEW's interactive flying-fox web viewer) that fit the habitat mapping criteria are known to occur. Further, no observations of flying-fox camps have been made during the field survey effort. As such no roosting habitat has been mapped.	N/A
Latham's snipe *Gallinago hardwickii*	Moderate	Foraging and dispersal	Foraging habitat includes open, freshwater wetlands (permanent and ephemeral) with low, dense vegetation such as swamps, flooded grasslands or heathlands, around bogs and other water bodies. Foraging occurs at night where they disperse to feed in nearby wet paddocks, ditches and other	Nominal buffer distance of 20 m applied to selected wetlands (including farm dams and seasonal wetlands) where suitable low, dense vegetation skirts the waterbody and muddy margins are present or likely temporally available under suitable conditions (i.e.	Artificial dams mapped within the Project Area

Species	Likelihood of Occurrence	Modelling Criteria	Habitat Requirements	Suitable Habitat within the Project Area	REs
			open flooded areas. Foraging habitats are characterised by areas of mud (either exposed or beneath a very shallow covering of water).	muddy/soil substrate with shallow sloping banks).	
SLC (Migratory and Non-migratory Fauna)					
oriental cuckoo *Cuculus optatus*	Moderate	Foraging and Dispersal	Monsoonal rainforest, wet sclerophyll forest, vine-thicket and dense riparian vegetation. Non-breeding foraging and dispersal habitat also includes open Casuarina, Acacia and Eucalyptus woodlands.	Open eucalypt forest to woodland characterised by remnant REs 11.12.1, 11.3.2, 11.3.25b, 11.3.4. Regrowth and non-remnant vegetation excluded due to absence of microhabitat including high perches and cover from aerial predators.	Remnant REs 11.12.1, 11.3.2, 11.3.25b, 11.3.4
fork-tailed swift *Apus pacificus*	Moderate	Foraging and dispersal	The air space above remnant and regrowth woodlands, open pasture grassland and non-remnant vegetation communities.	All remnant, regrowth and non-remnant vegetation included. Includes all areas above civil infrastructure and waterbodies occurring within the Project Area.	All areas within Project Area
osprey *Pandion haliaetus*	Moderate	Foraging and dispersal	Along rivers, creeks or other vegetated waterways where the waterway supports occasional pools. Farm dams also support foraging habitat for this species.	Riverine vegetation communities occurring along watercourses associated with the Calliope River including Maxwelton Creek, Doubtful Creek and Lost Springs Creek. Associated regional ecosystems along abovementioned creeks includes 11.3.25b and 11.3.25d. Artificial farm dams also considered suitable foraging habitat.	Remnant RE 11.3.25b and 11.3.25d and artificial farm dams
short-beaked echidna *Tachyglossus aculeatus*	High	Breeding, foraging and dispersal	Forages above a variety of vegetation types.	In vegetation associated with remnant, regrowth and non-remnant areas.	Remnant, regrowth and non-remnant vegetation

Appendix E

Threatened and Special Least Concern Species Habitat Modelling



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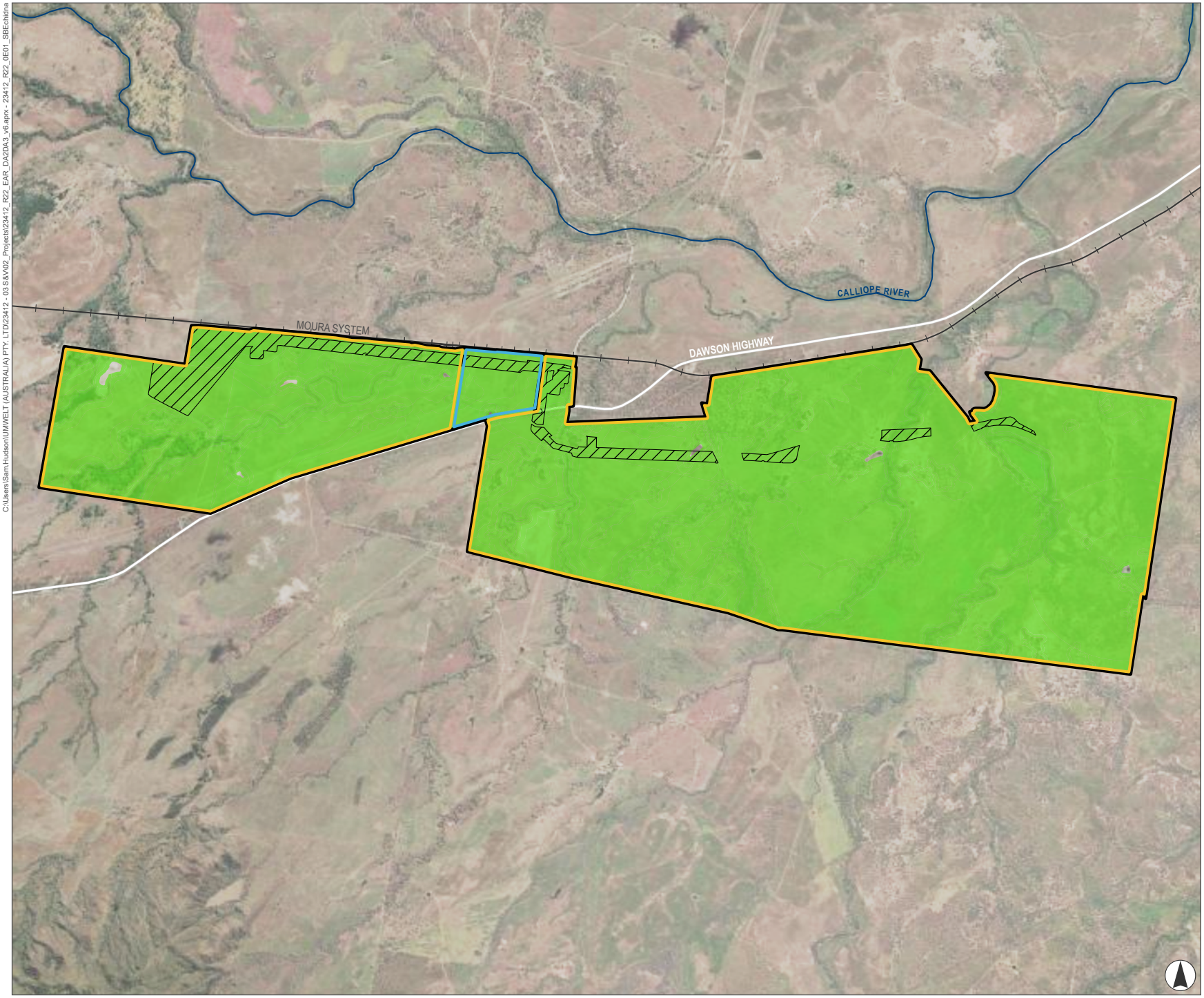


FIGURE E.1

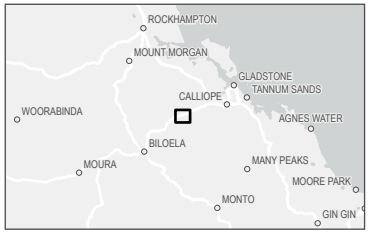
Potential Habitat for Short-beaked Echidna *(Tachyglossus aculeatus)*

Legend

- Project Area
- Project Area (DA2)
- Project Area (DA3)
- Vegetation Clearance Footprint (DA2 & DA3)
- Railways
- Major Roads
- Major Watercourse

Short-beaked Echidna *(Tachyglossus aculeatus)*

- Breeding, foraging and dispersal



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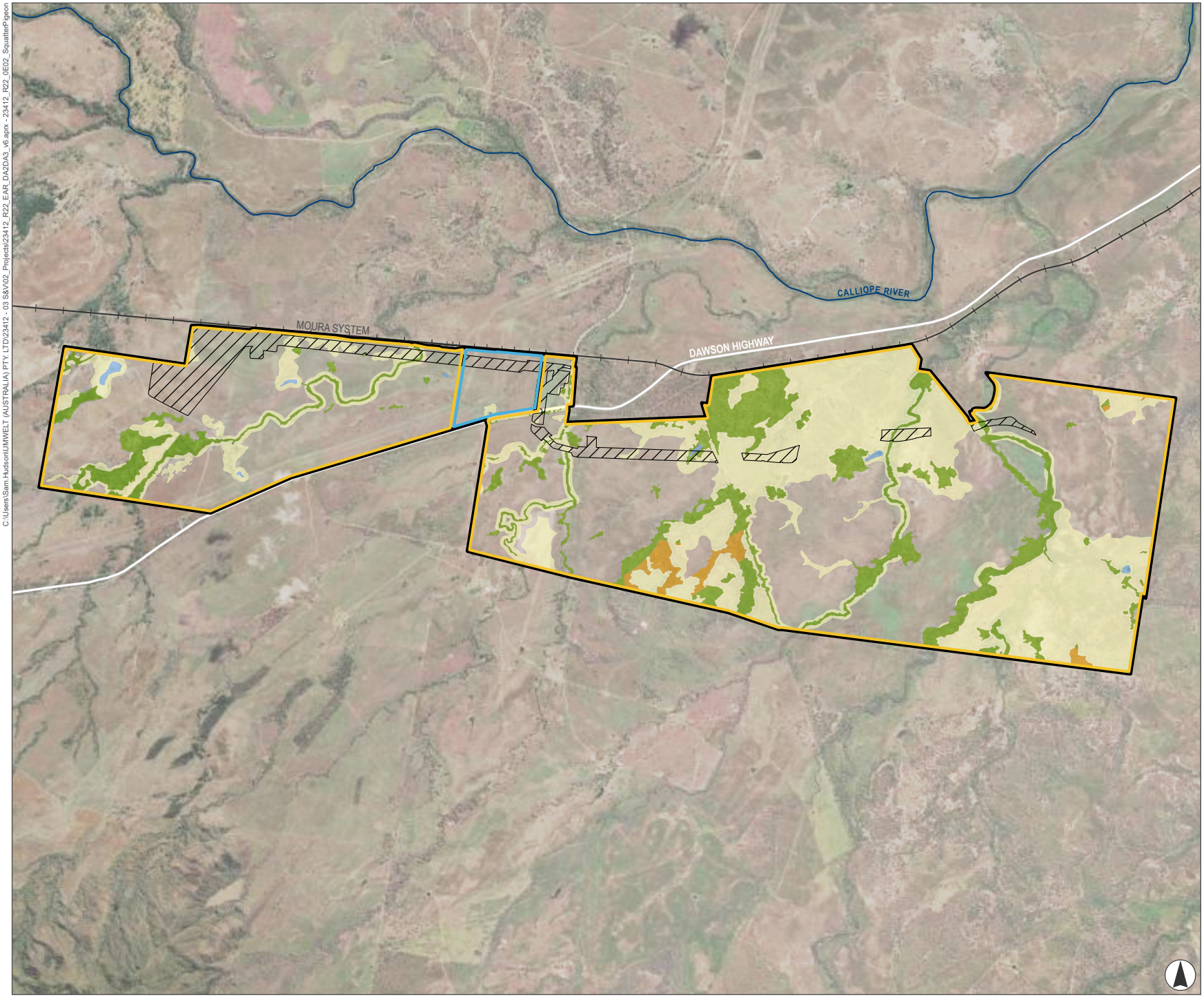


FIGURE E.2

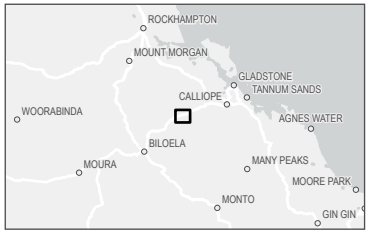
Potential Habitat for Squatter Pigeon (Southern) *(Geophaps scripta scripta)*

Legend

- Project Area
- Project Area (DA2)
- Project Area (DA3)
- Vegetation Clearance Footprint (DA2 & DA3)
- Railways
- Major Roads
- Major Watercourse

Squatter Pigeon (Southern) *(Geophaps scripta scripta)*

- Dispersal
- Foraging
- Potential water source
- Foraging and breeding



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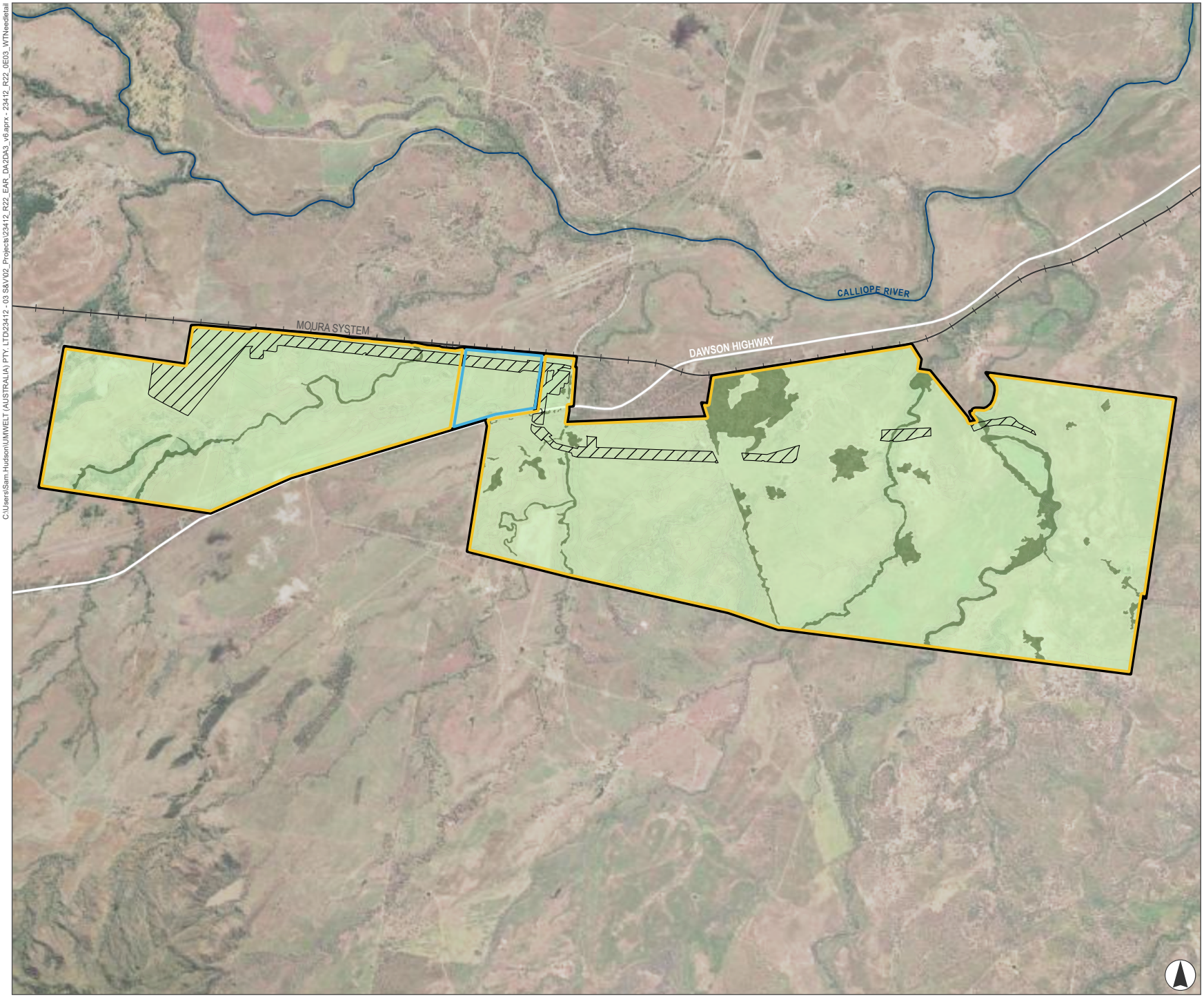


FIGURE E.3

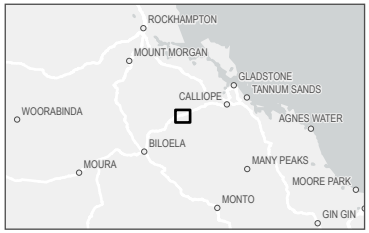
Potential Habitat for White-throated Needletail *(Hirundapus caudacutus)*

Legend

- Project Area
- Project Area (DA2)
- Project Area (DA3)
- Vegetation Clearing Footprint (DA2 & DA3)

White-throated Needletail *(Hirundapus caudacutus)*

- Dispersal and marginal foraging
- Foraging and roosting
- Major Watercourse
- Major Roads
- Railways



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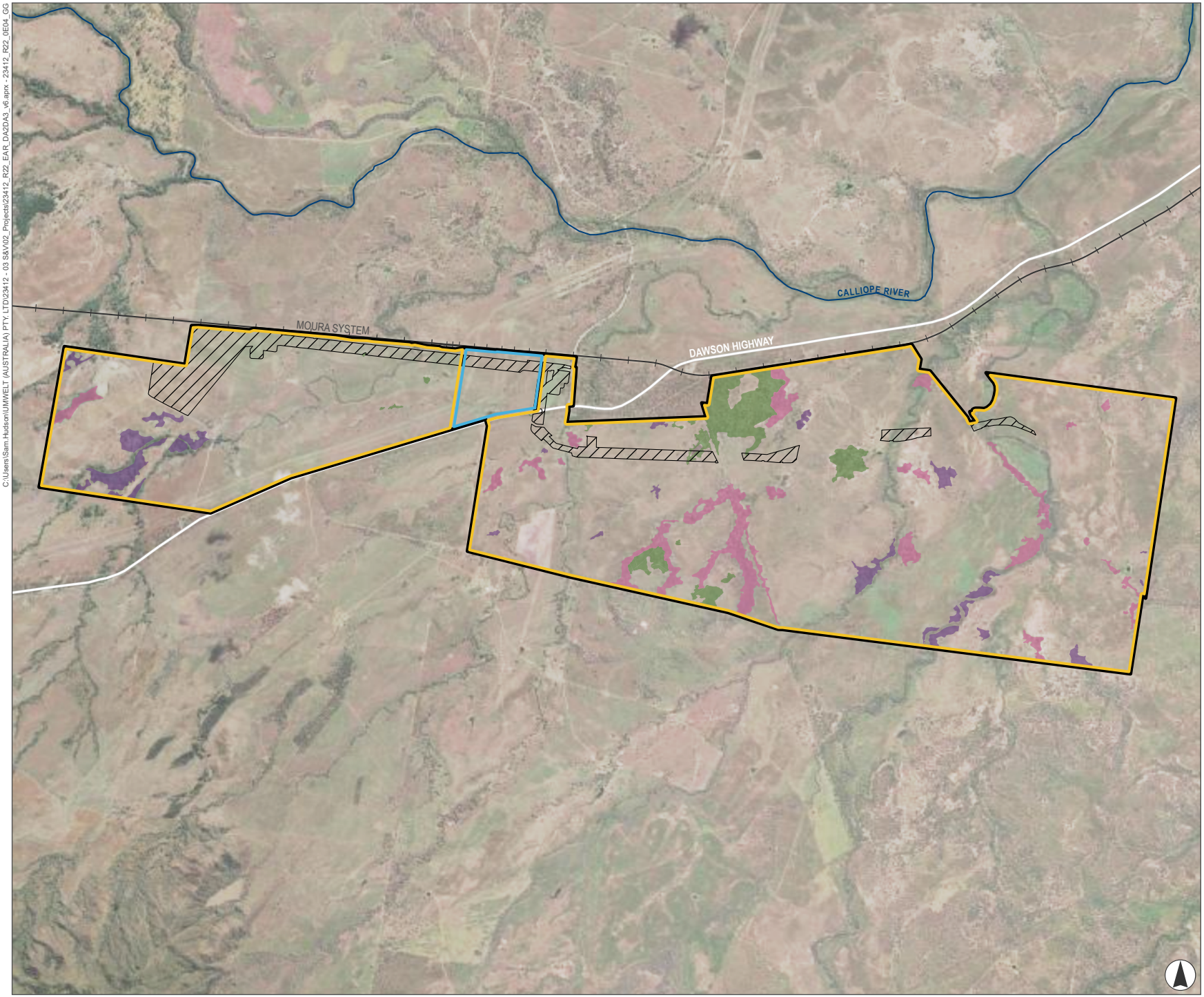


FIGURE E.4

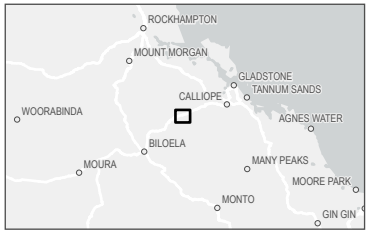
Potential Habitat for Southern Greater Glider *(Petauroides volans)*

Legend

- Project Area
- Project Area (DA2)
- Project Area (DA3)
- Vegetation Clearance Footprint (DA2 & DA3)
- Major Roads
- Railways
- Major Watercourse

Southern Greater Glider *(Petauroides volans)*

- Foraging and dispersal
- Likely current denning
- Potential future denning



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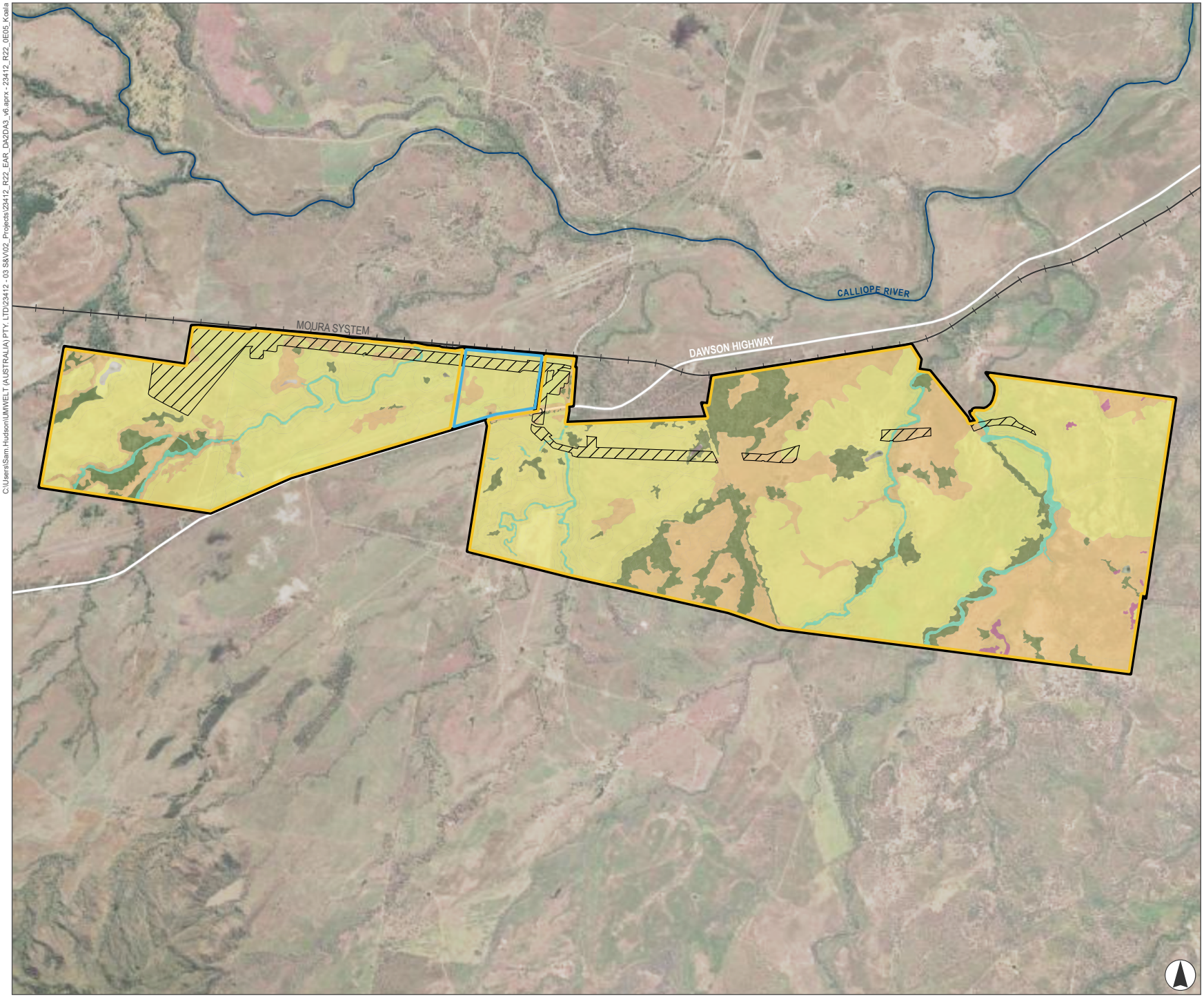


FIGURE E.5

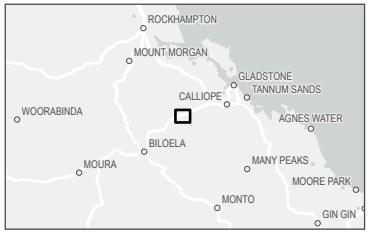
Potential Habitat for Koala *(Phascolarctos cinereus)*

Legend

- Project Area
- Project Area (DA2)
- Project Area (DA3)
- Vegetation Clearing Footprint (DA2 & DA3)
- Railways
- Major Roads
- Major Watercourse

Koala *(Phascolarctos cinereus)*

- Breeding and foraging
- Climate refugia
- Dispersal (with trees)
- Dispersal (without trees)
- Shelter



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Kilometres

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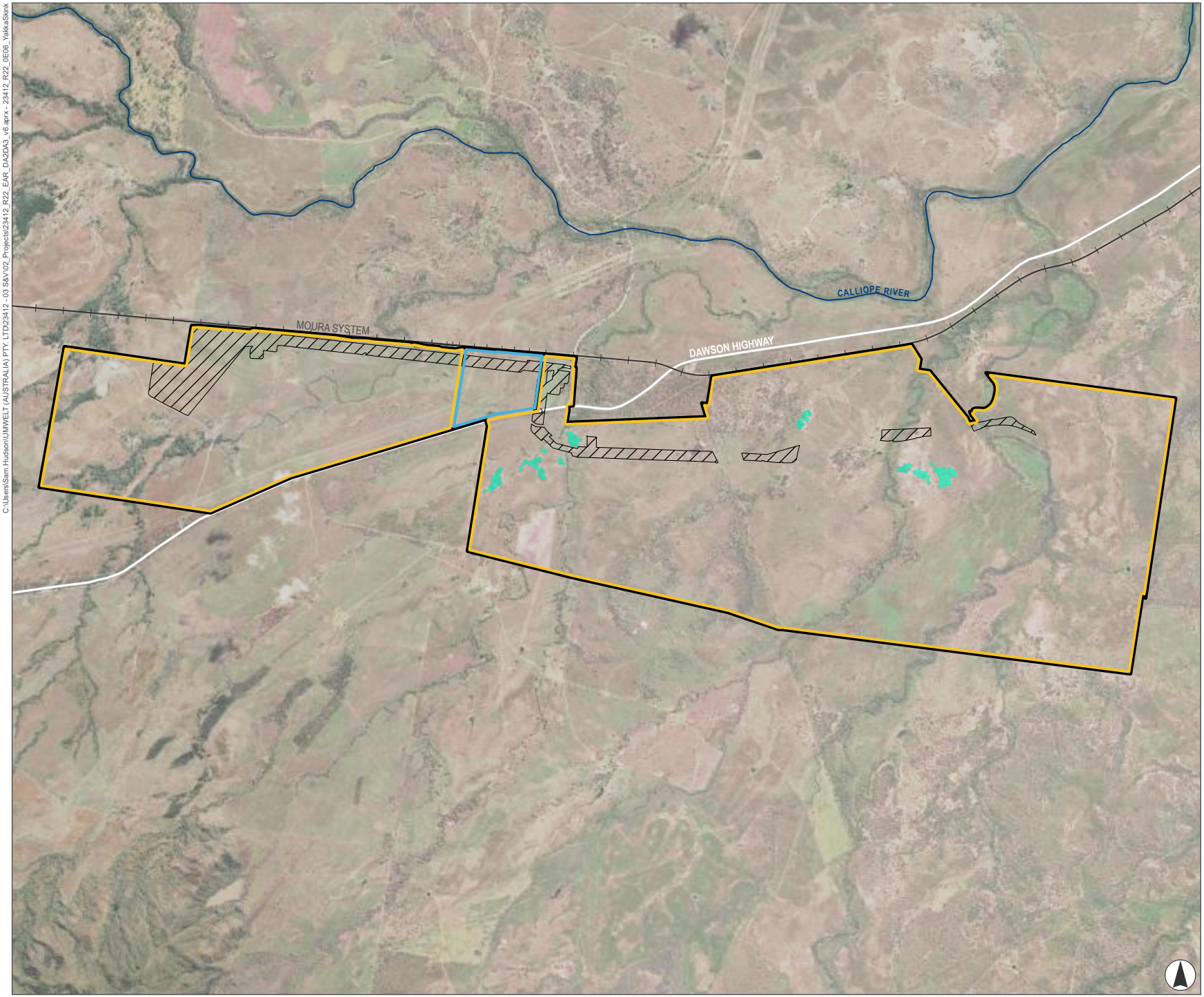


FIGURE E.6

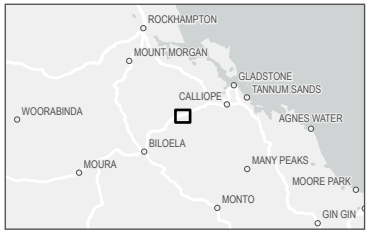
Potential Habitat for Yakka Skink *(Egernia rugosa)*

Legend

- Project Area
- Project Area (DA2)
- Project Area (DA3)
- Vegetation Clearance Footprint (DA2 & DA3)
- Railways
- Major Watercourse
- Major Roads

Yakka Skink *(Egernia rugosa)*

- Suitable Habitat



0 1 2

Kilometres

Scale 1:60,000 at A4
GDA1994 Zone 56

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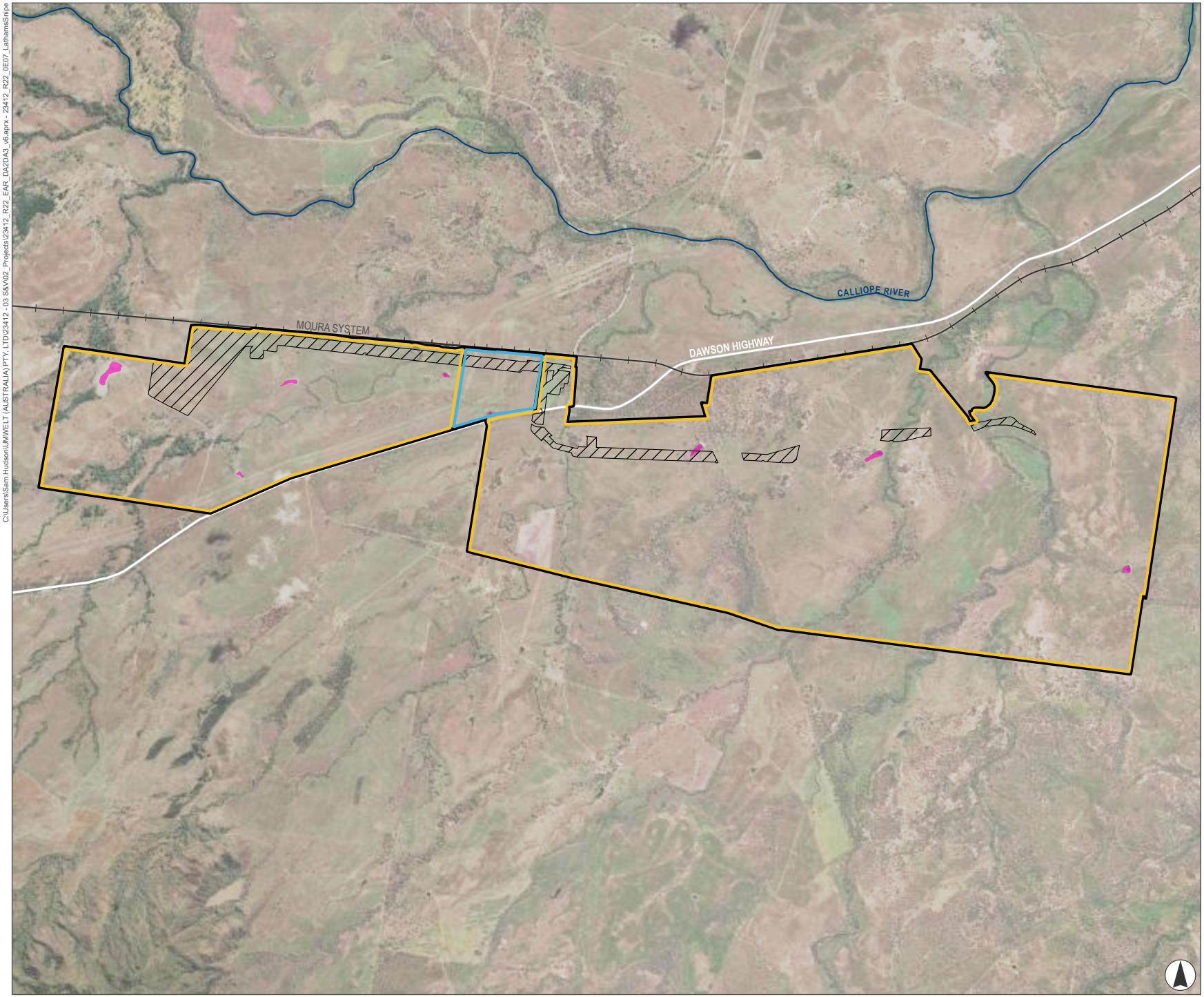


FIGURE E.7

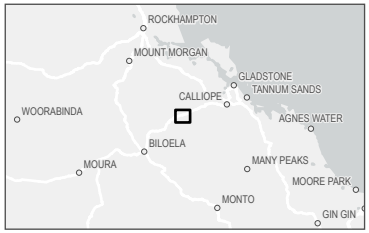
Potential Habitat for Latham's Snipe *(Gallinago hardwickii)*

Legend

- Project Area
- Project Area (DA2)
- Project Area (DA3)
- Vegetation Clearing Footprint (DA2 & DA3)
- Railways
- Major Watercourse
- Major Roads

Latham's Snipe *(Gallinago hardwickii)*

- Foraging and dispersal



0 1 2

Kilometres

Scale 1:60,000 at A4
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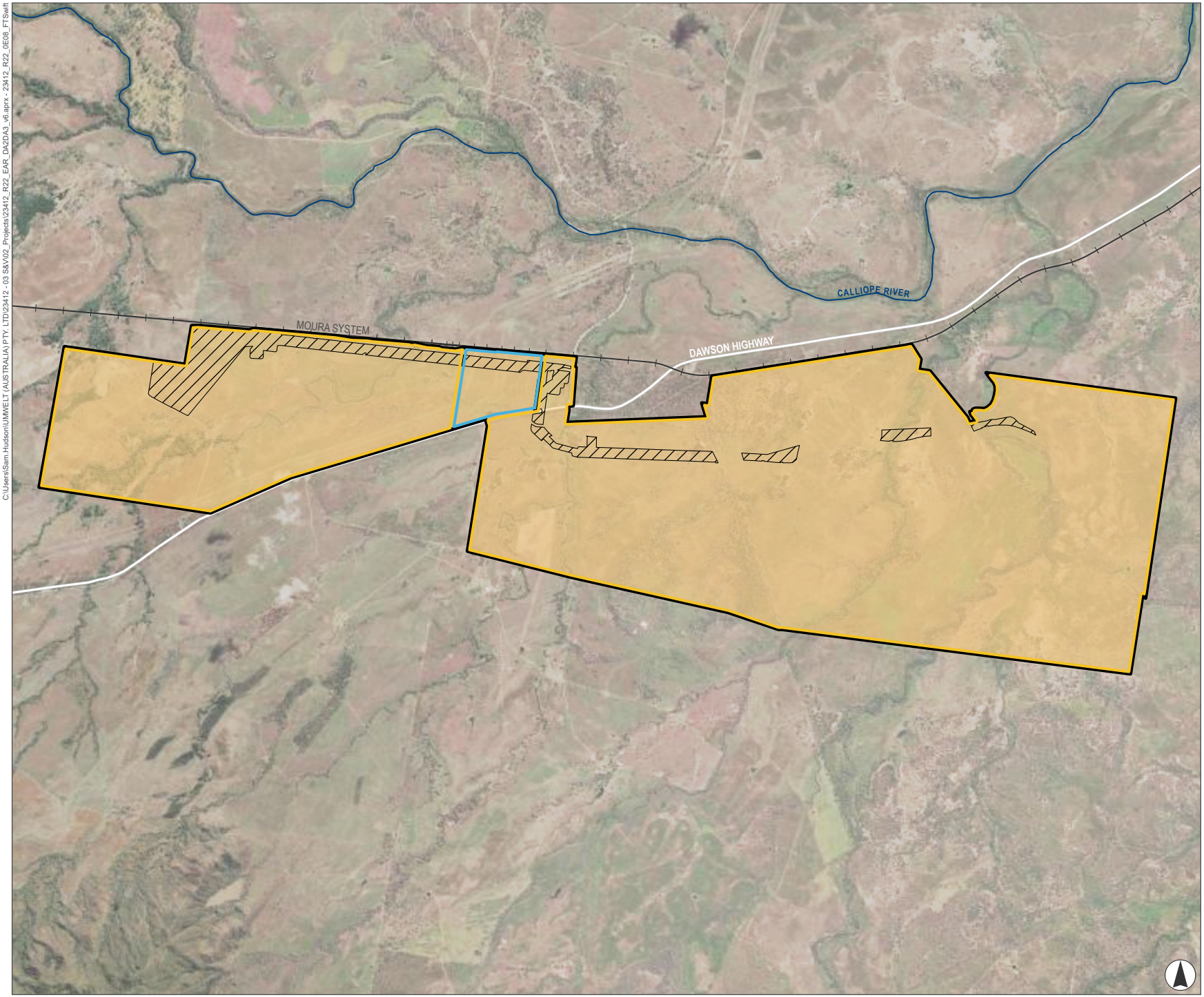


FIGURE E.8

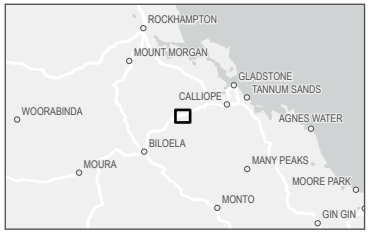
Potential Habitat for Fork-tailed Swift *(Apus pacificus)*

Legend

- Project Area
- Project Area (DA2)
- Project Area (DA3)
- Vegetation Clearance Footprint (DA2 & DA3)
- Railways
- Major Roads
- Major Watercourse

Fork-tailed Swift *(Apus pacificus)*

- Foraging and Dispersal



0 1 2

Kilometres

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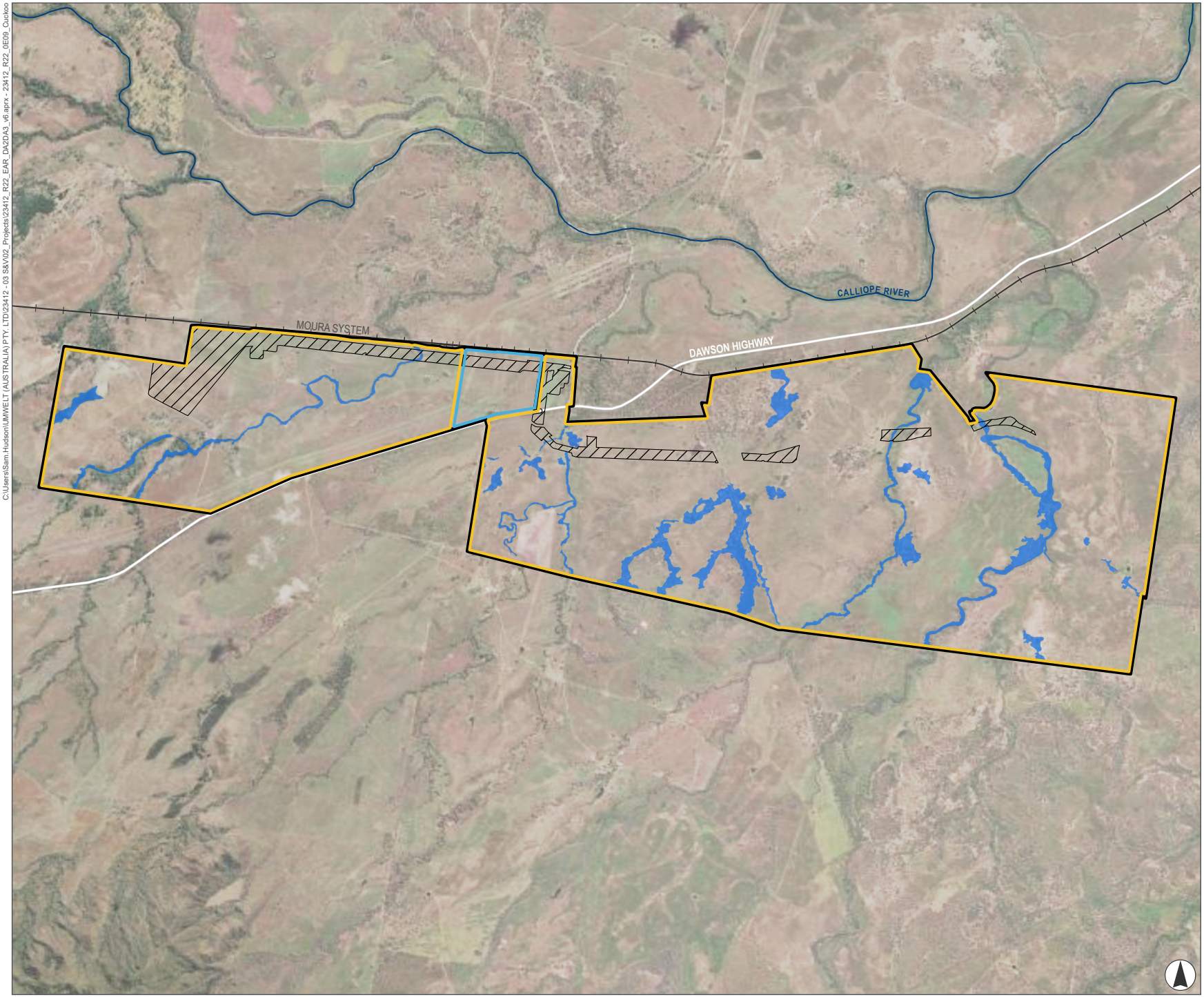


FIGURE E.9

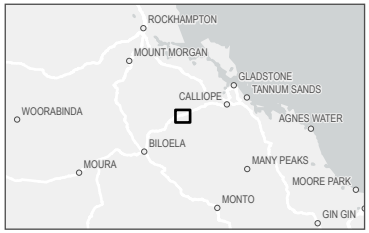
Potential Habitat for Oriental Cuckoo *(Cuculus optatus)*

Legend

- Project Area
- Project Area (DA2)
- Project Area (DA3)
- Vegetation Clearance Footprint (DA2 & DA3)
- Railways
- Major Roads
- Major Watercourse

Oriental Cuckoo *(Cuculus optatus)*

- Foraging and Dispersal



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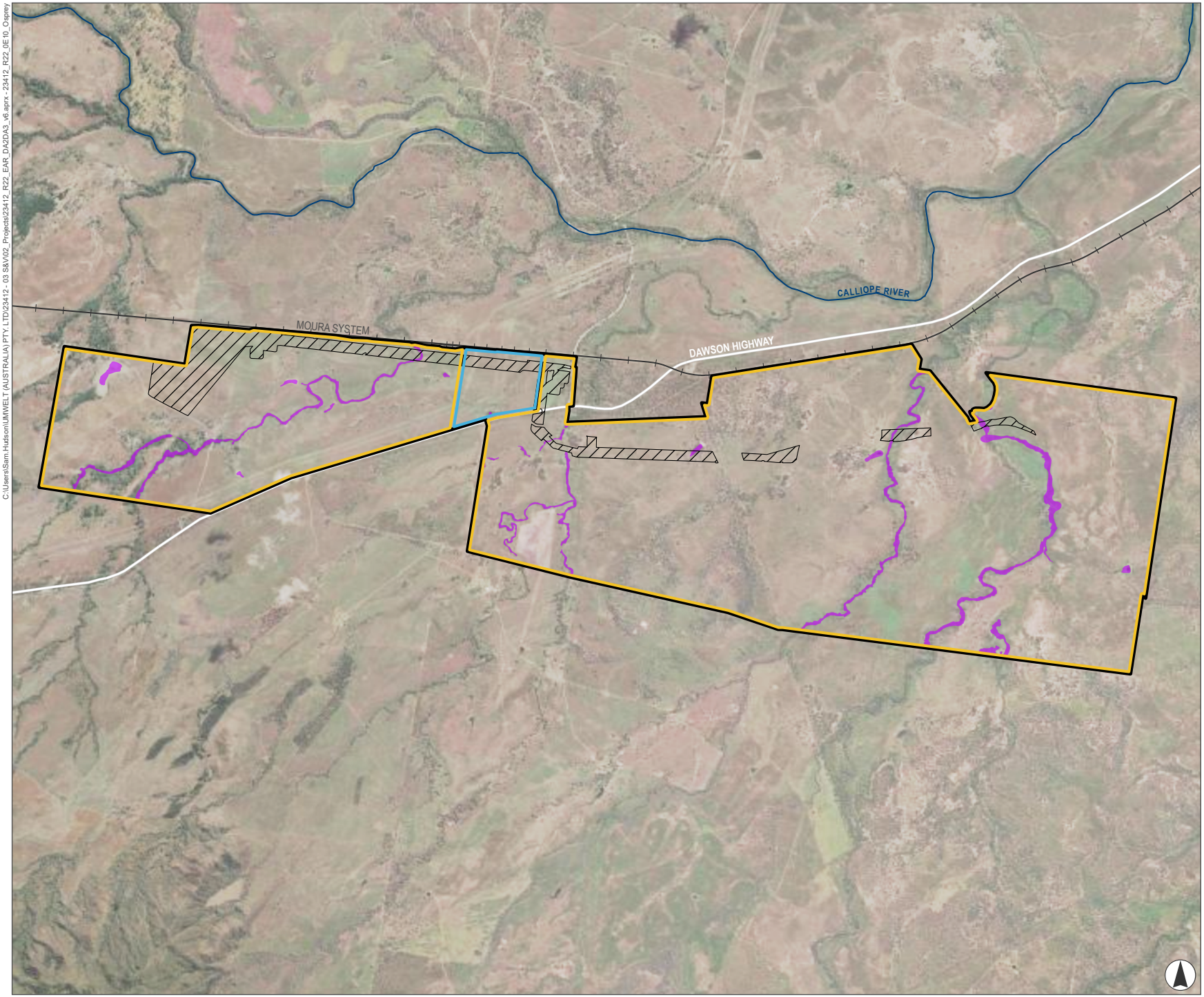


FIGURE E.10

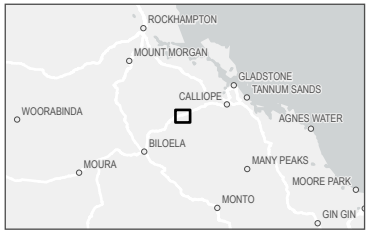
Potential Habitat for Eastern Osprey *(Pandion haliaetus)*

Legend

- Project Area
- Project Area (DA2)
- Project Area (DA3)
- Vegetation Clearance Footprint (DA2 & DA3)
- Railways
- Major Roads
- Major Watercourse

Eastern Osprey *(Pandion haliaetus)*

- Foraging and Dispersal



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Kilometres

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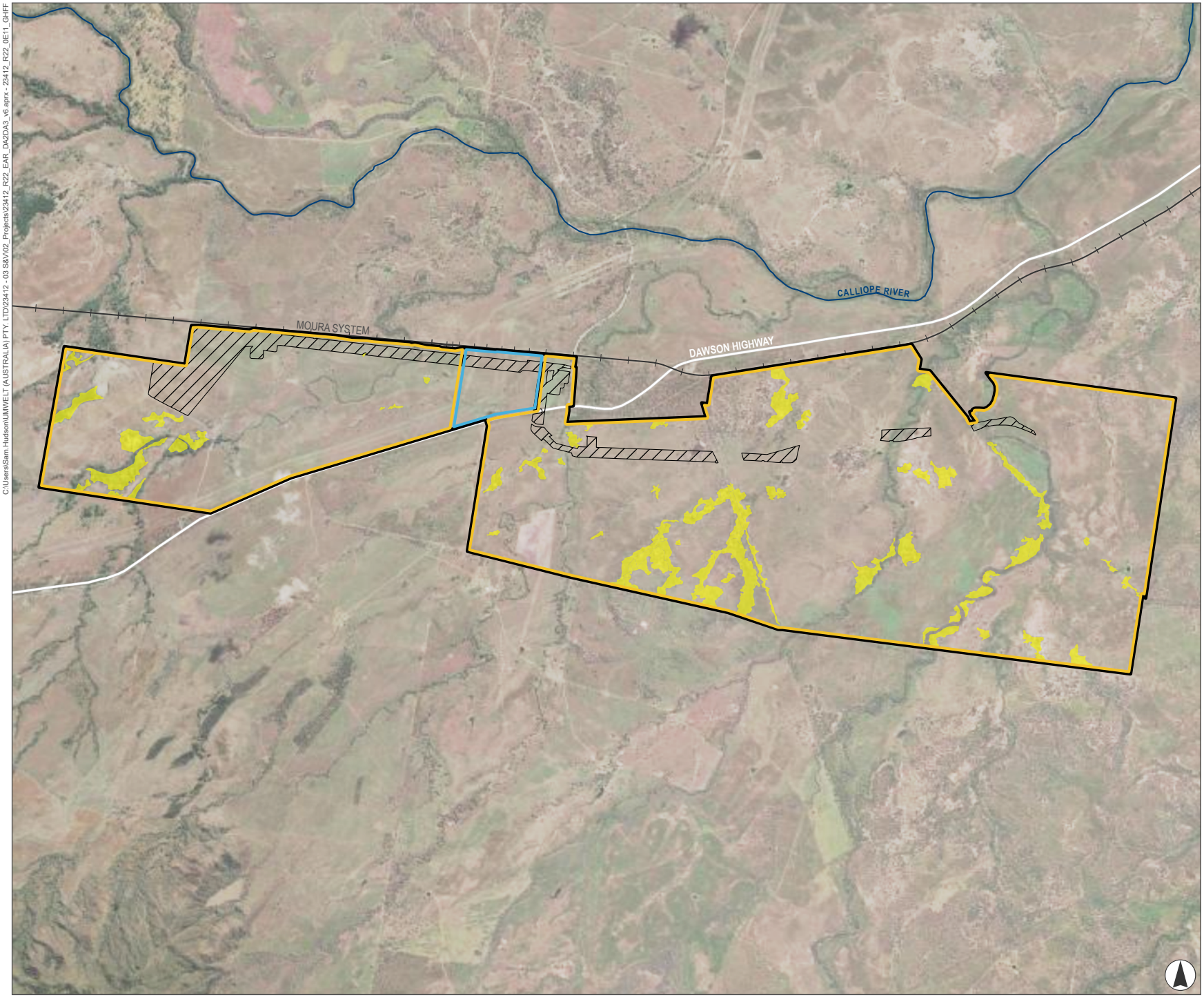


FIGURE E.11

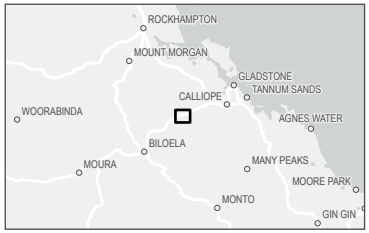
Potential Habitat for Grey-headed flying-fox *(Pteropus poliocephalus)*

Legend

- Project Area
- Project Area (DA2)
- Project Area (DA3)
- Vegetation Clearance Footprint (DA2 & DA3)
- Railways
- Major Roads
- Major Watercourse

Grey-headed Flying-fox *(Pteropus poliocephalus)*

- Foraging and dispersal



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Kilometres

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Appendix J

Electromagnetic Interference Assessment

AECOM Australia Pty Ltd
Level 8, 540 Wickham Street
Fortitude Valley Queensland 4006
Australia

DNV Australia Pty Ltd
Level 12, 350 Queen Street
Melbourne Victoria 3000
Australia
ABN 14 154 635 319

Date:	Our reference:	Your reference:
22 April 2026	10587095-AUMEL-L-01-D	N/A

RE: Electromagnetic interference review for the proposed Wooderson Solar Farm overhead transmission line

AECOM Australia Pty Ltd (AECOM or "the Customer") has engaged DNV Australia Pty Ltd (DNV) on behalf of Wooderson Solar Development Co Pty Ltd ("the Proponent") to carry out a review of the electromagnetic interference (EMI) impacts for the proposed transmission line (OHTL) and switchyard of the Wooderson Solar Farm ("the Project").

1 PROJECT DESCRIPTION

The following project description and associated figures have been provided by the Customer:

"The proposed Wooderson Solar Farm is located approximately 40 kilometres (km) south-west of Gladstone in Central Queensland, within the Gladstone Regional Council (GRC) Local Government Area (LGA). The Proponent is Wooderson Solar Development Co Pty Ltd, a wholly owned subsidiary of Central Queensland Power Development Co Pty Ltd (CQP), which is a joint venture between RES Australia Pty Ltd (RES) and Energy Estate (CQP) Holdings Pty Ltd as trustee for Energy Estate (CQP) Holdings Trust (Energy Estate).

The solar farm is proposed to have a generating capacity of up to 450-megawatts (MW) with a 450 MW direct current (DC) coupled battery energy storage system (BESS) with storage capacity of up to 3,600 megawatt-hours (MWh). This will be connected to the National Electricity Market (NEM) through a new overhead transmission line and will also include construction of associated infrastructure including access tracks, fencing and operations and maintenance facilities.

The solar farm, BESS and associated infrastructure will be assessed in a Development Application (DA) by the State Assessment and Referral Agency (SARA), identified as Development Application 1 (DA1) and does not form part of this assessment.

The works outlined in this assessment include connection to the NEM through a 275 kilovolt (kV) overhead transmission line (OHTL), switchyard and associated ancillary infrastructure for these elements only (the Project). A total of approximately 11 km of OHTL supported by approximately 45 monopoles is proposed from the solar farm substation (assessed in DA1) to the new switchyard for connection to Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project.

The Project extends over 7 allotments (refer Figure 1), within the GRC LGA, 7 of which (including part Lot 1 on RP616641) are subject to assessment under the Gladstone Regional Council Planning Scheme 2017 (Version 2) (Planning Scheme) and one allotment (part Lot 1 on RP616641) requiring assessment under the Callide Infrastructure Corridor State Development Area (SDA) subject to the Callide Infrastructure Corridor State Development Area Development Scheme (September 2012) (Development Scheme).

As the OHTL extends across 2 planning instruments (refer Figure 2), the assessment provided within this report will support 2 separate DAs:

- *Development Application 2 (DA2) – Transmission Corridor and Switchyard within the GRC LGA to be assessed by GRC with referral to concurrence and advice agencies*
- *Development Application 3 (DA3) – Transmission Corridor within the Callide Infrastructure Corridor SDA to be assessed by the Office of the Coordinator General (OCG).*

1.1 Project overview

The Project is for the purposes of connecting the solar farm and BESS to the NEM and comprises of the following components:

- *approximately 11 km of 275 kV OHTL, contained within a 60 metre (m) wide easement, discussed further in section 1.1.1*
- *new switchyard for connection to Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project, discussed further in section 1.1.2.*

For the purposes of this application, the following has been used to define the Project to delineate between permanent impact areas and temporary impact areas and are defined as follows (Figure 3):

Project Area:

The Project infrastructure and vehicular access will be situated within the bounds of the 'Project Area' which comprises of freehold allotments, Dawson Highway Road Reserve, Duck Holes Road Reserve and two unnamed road reserves. The Project Area has a total area of 2675.91 hectares (ha).

Project Disturbance Footprint:

The Project Disturbance Footprint (estimated to be 209.619 ha) is defined as including permanent and temporary components for construction:

Permanent components include the following:

- *approximately 11 km of 275 kV OHTL, contained within a 60 m wide easement*
- *approximately 45 monopoles, contained within the 60 m wide easement*
- *new switchyard (either Option A or Option B)*
- *access tracks located within the 60 m wide easement that will be used for ongoing maintenance*
- *access tracks (where located outside the easement) that will be used for ongoing maintenance*
- *vegetation clearing*
- *security fencing.*

Temporary components include the following:

- *Option A and Option B switchyard construction compound area*
- *Option A and Option B switchyard temporary laydown area*
- *vegetation clearing.*

The Project Disturbance Footprint includes a buffer around the proposed infrastructure to allow for design refinement during detailed design.

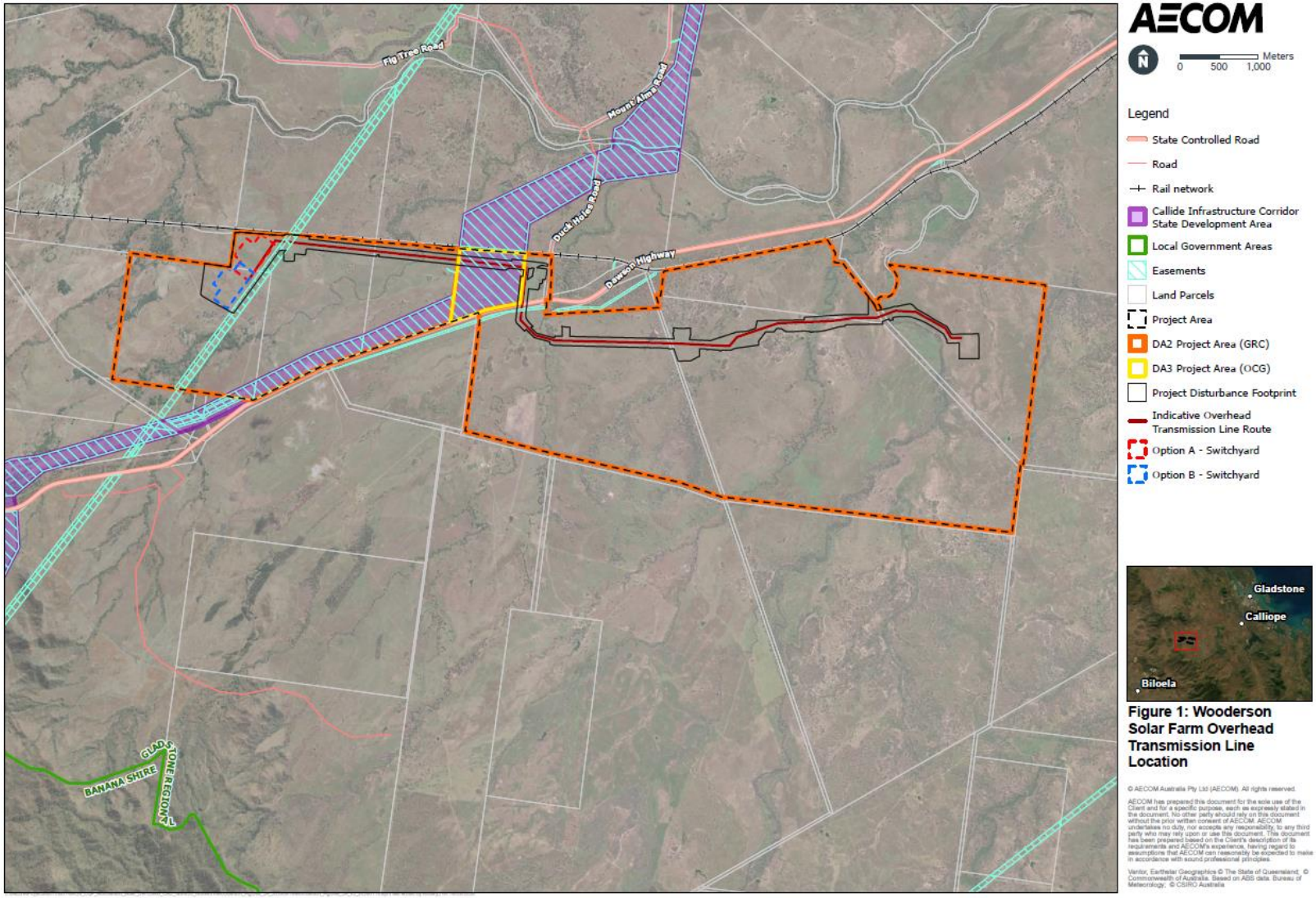


Figure 1: Wooderson Solar Farm Overhead Transmission Line Location

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Figure 1 Wooderson Solar Farm Overhead Transmission Line Location

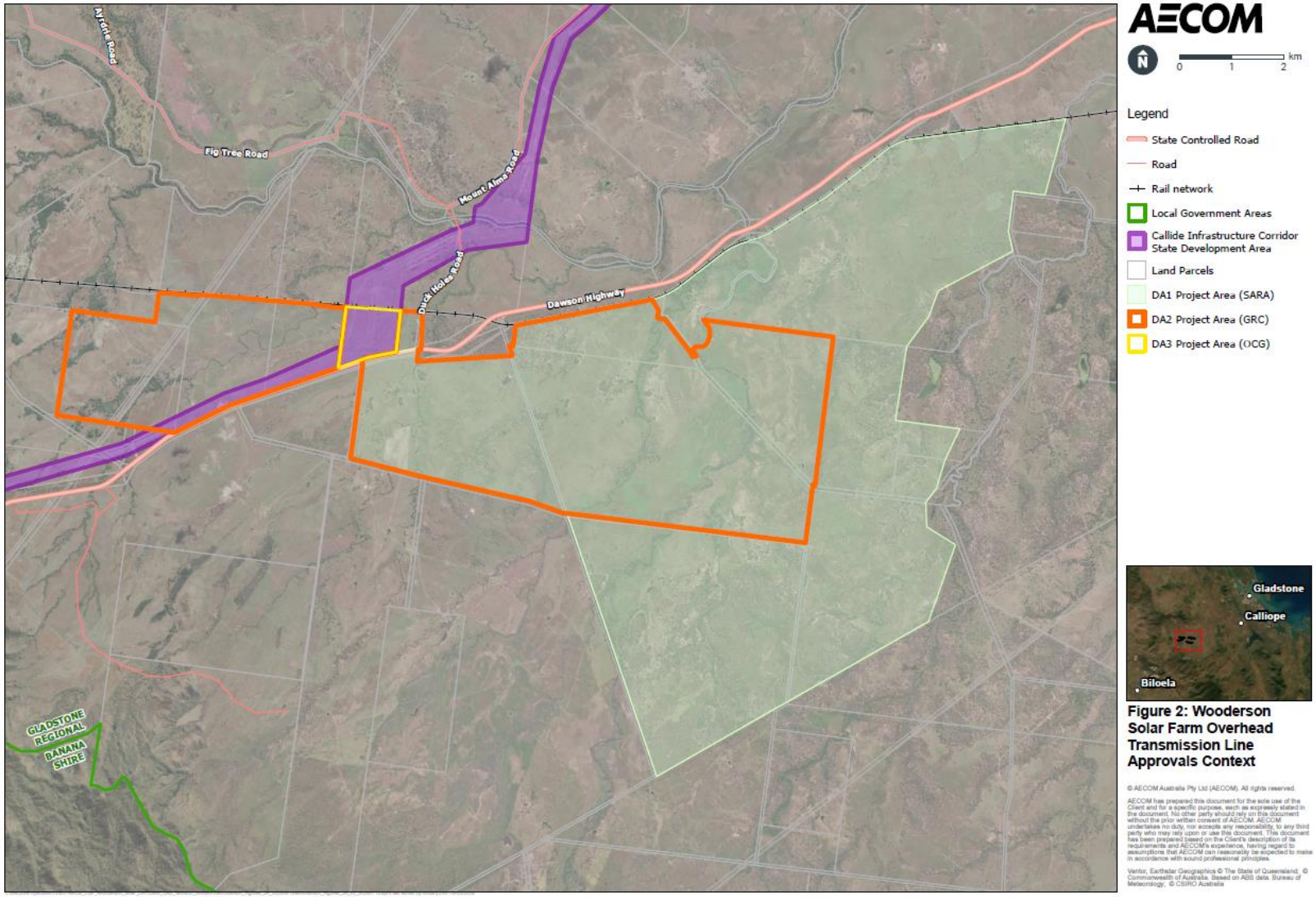


Figure 2: Wooderson Solar Farm Overhead Transmission Line Approvals Context

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Figure 2 Wooderson Solar Farm Overhead Transmission Line Approvals Context

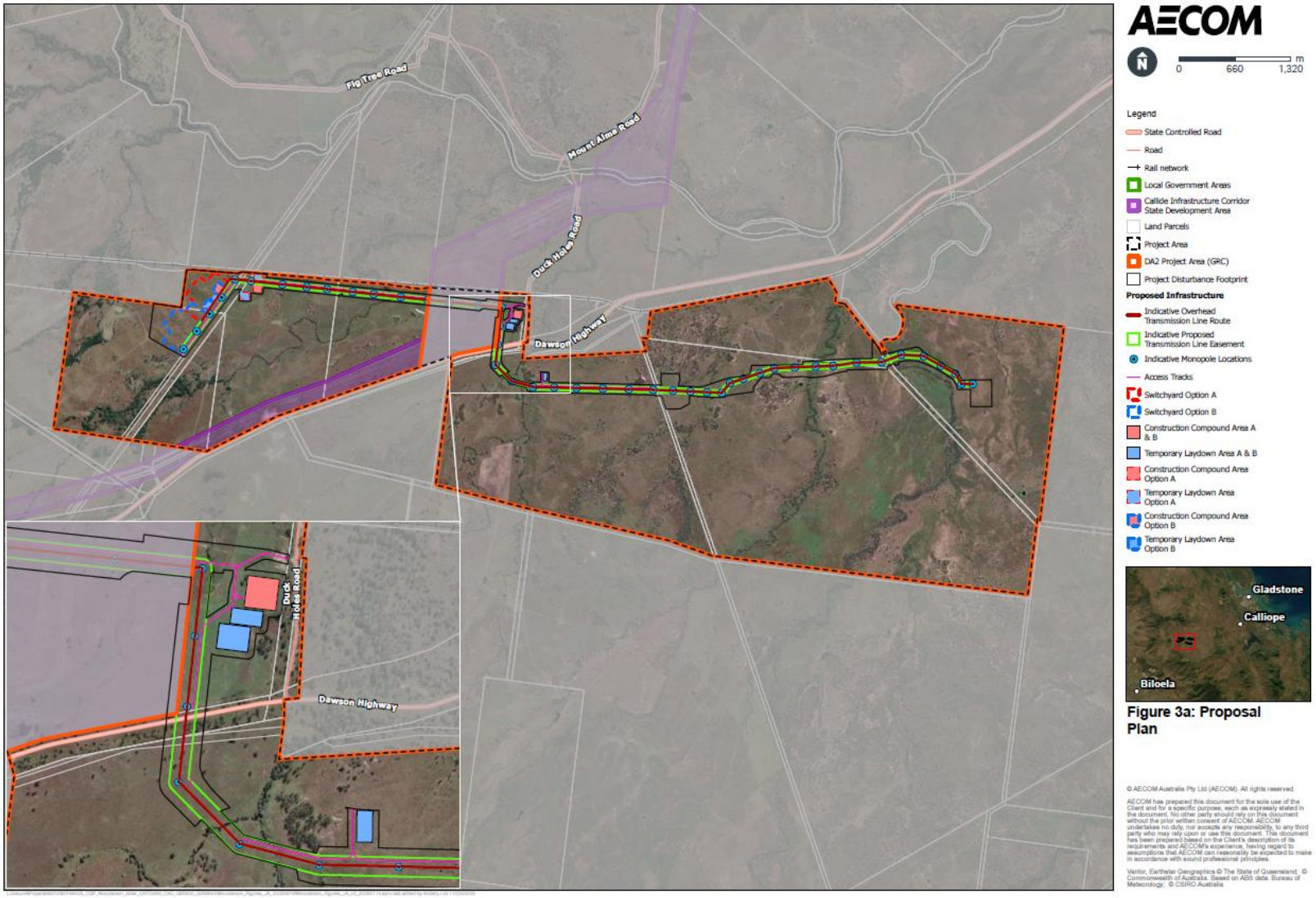


Figure 3a: Proposal Plan

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Figure 3a Proposal Plan

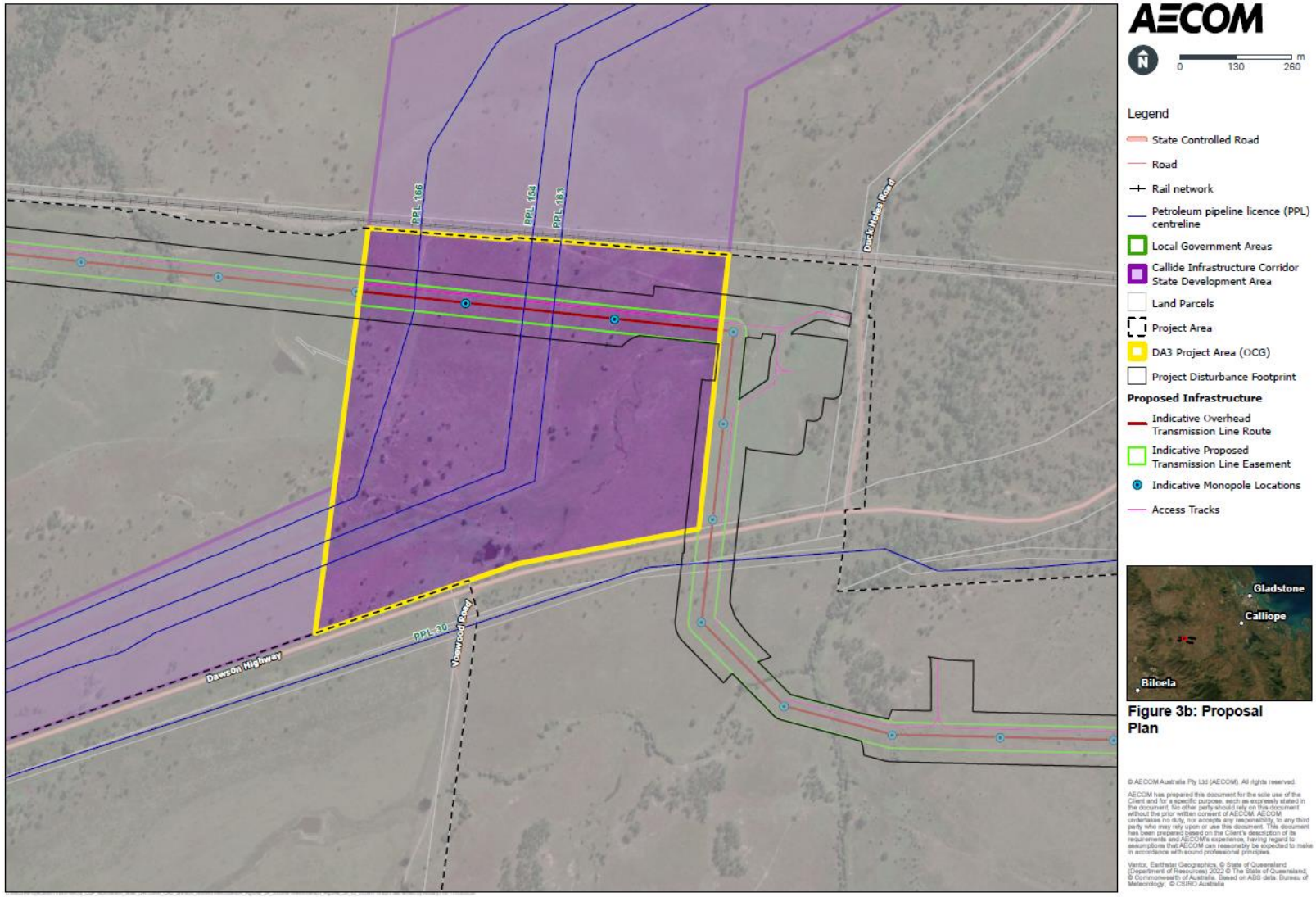


Figure 3b Proposal Plan

1.1.1 Overhead transmission line

The proposed OHTL extends approximately 11 km from the solar farm substation, traverses west to the proposed new switchyard and connects into Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project.

The OHTL will be contained within a 60 m wide easement (Figure 3). The OHTL will be located with the jurisdiction of the Planning Scheme and Development Scheme (Figure 2). The following delineates between the infrastructure and works located in each jurisdiction:

The OHTL within the Planning Scheme jurisdiction will:

- *traverse 7 freehold allotments*
- *comprise approximately 10 km of OHTL*
- *be partly within and adjoining Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project and existing Calvale to Wurdong 275kV Transmission Line, where the OHTL will under cross the existing and proposed transmission lines*
- *travel adjacent to Option A and Option B switchyard, construction compound and construction laydown area, which also adjoins Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project*
- *require approximately 43 monopoles with a maximum height of 50 m. The monopoles will be constructed of either steel or concrete. Monopoles will have a foundation radius of approximately 15 m, with some monopoles (particularly corner monopoles) requiring stays. The final requirements for stays will be confirmed during detailed design. Refer to Figures 4-6 depicting indicative monopoles and Figure 3 for indicative monopole locations. It is noted that these are indicative locations only and will be subject to refinement during detailed design which will take into account impact assessment findings and approval requirements.*

The OHTL within the Development Scheme jurisdiction will:

- *traverse 1 freehold allotment*
- *approximately 840 m of OHTL*
- *traverse an easement containing gas pipelines and located within the Development Scheme*
- *require up to 2 monopoles with a maximum height of 50 m. The monopoles will be constructed of either steel or concrete. Monopoles will have a foundation radius of appropriately 15 m, some monopoles particularly corner monopoles requiring stays. The foundations of a third monopole may partially be located within the Development Scheme jurisdiction, with the centre of the pole located immediately west of the Development Scheme jurisdiction. Refer to Figures 4-6 depicting indicative monopoles and Figure 3 for indicative monopole locations.*



Figure 4 Example 275 kV OHTL under construction
(Cowell Electric, 2025)



Figure 5 Example 275 KV OHTL
(Australian Power Industry Partners, 2025)



Figure 6 275 kV Example OHTL with access track (Cowell Electric, 2025)

1.1.2 Switchyard

A new switchyard is proposed to be located at the western end of the OHTL for cut-in connection to Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project (Figure 3). The final location of this switchyard is awaiting confirmation from Powerlink, with two potential locations assessed for the purposes of this application being Option A (red) and Option B (blue) (Figure 3). Both options are proposed to be included within the Project Disturbance Footprint to allow for flexibility in the final location and allow for continued discussions with Powerlink.

The switchyard includes a cleared level platform of approximately 170 m by 80 m for connection of Wooderson Solar Farm, subject to confirmation with Powerlink. There will also be space for potential future expansion contained within a security fence. It will include switchgear to isolate circuits in an emergency, as well as devices to monitor and communicate the performance or circuits.

The Project Disturbance Footprint includes the maximum possible area required for the switchyard.

The switchyard will ultimately be transferred to the ownership of Powerlink, the Transmission Network Service Provider. This is anticipated to occur upon commissioning of the switchyard, however the timing is subject to confirmation with Powerlink. An example of a Powerlink switchyard is shown in Figure 7 below."



Figure 7 Example Powerlink switchyard (Cowell Electric, 2025)

2 EMI ASSESSMENT

2.1 Background

Electrical OHTLs, switchyards, and associated infrastructure can potentially cause EMI to radiocommunication signals in two ways:

- the physical presence of the OHTL, switchyard infrastructure, and other infrastructure causing diffraction or obstruction of the signals, reflection or scattering of the signals, or near field effects
- electromagnetic noise produced by the OHTL or switchyard infrastructure causing radio frequency interference (RFI).

2.1.1 Interference caused by physical presence

The physical presence of an OHTL, switchyard infrastructure, and associated infrastructure can cause interference to radiocommunication signals and services through the same mechanisms as for other physical obstacles such as buildings. Diffraction or obstruction of signals by OHTL and switchyard infrastructure may decrease the signal strength or quality at the receiving antenna. Similarly, reflection, scattering, or re-radiation of signals by this infrastructure can reduce the strength of the received signal or cause multi-path errors that result in degradation or distortion of the primary signal from the transmitter [1],[2]. Near-field effects may also occur if the infrastructure is located too close to a transmitting or receiving antenna. The potential for interference depends primarily on the signal characteristics and the location of the infrastructure in relation to the transmitting and receiving antennas, but may also be influenced by factors such as the physical configuration of the OHTL and the directivity of the antennas [2].

2.1.2 Interference caused by electromagnetic noise

Electromagnetic noise (also called radio noise) is defined as a natural or unintended emission of electromagnetic radiation with frequencies in the radio frequency range, which can interfere with desired signals by being superimposed on, or combined with, those signals [3]. Electromagnetic noise is produced by OHTLs when electricity is discharged from the line into the surrounding air through either corona effects or gap-type discharges.

Corona is an electrical discharge from the surface of a power line caused by the ionization of air, and subsequent partial breakdown of the insulating properties of the air around the line, in the presence of a strong electric field [1]. When this discharge occurs, it may be accompanied by audible noise, visible light, and electromagnetic radiation. For high-voltage OHTLs (above a nominal voltage of 220 kV in Australia), the resulting electromagnetic noise occurs at a frequency that has potential to interfere with radio and television broadcasting signals and may affect other communications systems or sensitive receivers such as radio telescopes [1]. However, such RFI is generally associated with OHTLs operating at voltages of 345 kV or higher (often described as extra-high-voltage lines) and is less likely to be an issue at lower voltages [1],[4]. Besides varying with the line voltage and current, the occurrence and strength of corona discharges is also influenced by the physical configuration of the line, the shape and size of the conductors, and the height of the line above ground. Corona activity is more likely to occur during wet weather conditions and at higher altitudes, and can be exacerbated by degraded or damaged insulators, surface contamination of the line, and loose or improperly installed hardware [4],[5]. Since corona discharges correspond to a loss of electrical energy, they are considered undesirable from an operational perspective and modern OHTLs are normally designed to minimise these effects.

Gap-type discharges occur when there is a complete breakdown of the air insulation between two conducting components that are separated by a very small physical gap. Such discharges are commonly caused by loose or broken hardware or wires on low-voltage and medium-voltage power lines, and are not normally an issue for high-voltage OHTLs due to the use of modern equipment and maintenance procedures that reduce the potential for unintended gaps and electrical losses to occur [4],[5].

For the high-voltage OHTL proposed for the Project, corona discharges are expected to be the primary source of electromagnetic noise [1]. Such discharges have the potential to cause RFI to television and radio broadcasting signals and could impact on other sensitive radiocommunications. However, DNV notes that RFI is most likely to be an issue for signals in the AM frequency band (520 kHz to 1610 kHz) and the higher frequency signals used for point-to-point links, FM radio, digital television (DTV), and mobile phone services are not typically affected [3],[4]. Additionally, as noted above, RFI is less likely to be an issue for the proposed 275 kV OHTL than for a higher voltage line.

Although switchyard infrastructure can also potentially interfere with radiocommunication signals through the emission of electromagnetic noise, these impacts have not been considered in detail in this assessment. It is expected that the switchyard components will be designed and operated in compliance with the emission requirements specified by the relevant standards, which are intended to provide an adequate level of protection to radiocommunication services.

2.2 Locations of radiocommunication services and potential for interference

2.2.1 Interference caused by the physical presence of the OHTL

2.2.1.1 Point-to-point links

The physical presence of the OHTL, switchyard infrastructure, and associated infrastructure has potential to interfere with point-to-point links through diffraction, reflection or scattering, or near-field effects. However, this can usually be avoided by keeping clear of an appropriate exclusion zone around the link path or the transmitting or receiving antenna. Studies have shown that, to avoid interference to point-to-point links caused by signal diffraction or reflection or scattering of signals, OHTLs should be kept outside of the first Fresnel zone [2].

DNV has determined the transmission paths of the registered point-to-point licences for radiocommunication towers in the vicinity of the Project according to the ACMA RRL database [6]. There are eight links recorded in the ACMA RRL database that pass over the proposed OHTL route, operated by Telstra Limited (Telstra), Optus Mobile Pty Limited (Optus) and Aurizon Network Pty Ltd (Aurizon). The details of the links are provided in Table 4, and the link paths are shown in greater detail in Figure 8 based on information obtained from the ACMA RRL database and extracted from aerial or satellite imagery. To simplify reporting, each link has been assigned a unique identifier (e.g. Link #1) so that it can be easily distinguished. There are no point-to-point links passing over or near the proposed switchyard locations.

For each of the links crossing the proposed OHTL, DNV has established a diffraction exclusion zone based on the first Fresnel zone for that link.

For the point-to-point links crossing the OHTL route, DNV has assessed the potential for the OHTL to intersect with the first Fresnel zone in the vertical plane. This was achieved by examining the elevation and antenna heights at the ends of the link, as well as the elevation of the location at which the link intersects with the OHTL route. Specific information about the intended line height and configuration for the proposed OHTL was provided by the Customer [8][9]. Assuming a maximum sag in the line of 8.5 m above ground level (AGL), which has been determined through the OHTL concept design, it is expected that the proposed OHTL could occupy the region between 8.5 m and 50 m AGL.

The results of this analysis are summarised in Table 1. The first Fresnel zones for the point-to-point links operated by Optus and Telstra, and links #1 and #2 operated by Aurizon are expected to pass over the OHTL in the vertical plane. Therefore, based on this assessment, it is not expected that the OHTL will cause interference to these point-to-point links through diffraction, reflection, or scattering of the signals. The first Fresnel zone of link #3 operated by Aurizon is intersected in the vertical plane and therefore there is potential for interference to this link through diffraction, reflection, or scattering of the signals.

Table 1 Potential for impact to point-to-point links crossing the proposed transmission line route

Link no.	Operator	Clearance of the first Fresnel zone in the vertical plane relative to the proposed transmission line	Expected impact
1, 2	Aurizon Network Pty Ltd	Clear – first Fresnel zone is expected to pass over the OHTL	None
3	Aurizon Network Pty Ltd	Obstructed	Potential for interference within the DA3 Project Disturbance Footprint
4, 5, 6, 7	Optus Mobile Pty Ltd	Clear – first Fresnel zone is expected to pass over the OHTL	None
8	Telstra Corporation Limited	Clear – first Fresnel zone is expected to pass over the OHTL	None

DNV considers that the proposed OHTL and switchyard locations are sufficiently far from all radiocommunication towers in the vicinity of the Project to avoid near-field effects. The nearest radiocommunication tower is located approximately 170 m from the proposed OHTL route, at the end of point-to-point link #3. Reference [6] presents an equation for estimating the radius of the near-field zone for a point-to-point link from the properties of the transmitting or receiving antenna. DNV has established near-field interference zones for this tower based on the operating frequency and antenna gain for the associated point-to-point links plus an additional uncertainty buffer to account for potential inaccuracies in the tower location given in the ACMA RRL database. The proposed OHTL route is well clear of the potential near-field interference zones for these towers. Therefore, it is not expected that the OHTL will cause interference to the point-to-point links or other radiocommunication signals through this mechanism.

2.2.1.2 Point-to-multipoint links

OHTLs and switchyard infrastructure can potentially cause interference to point-to-multipoint links through the diffraction, reflection, or scattering of the signals as described above for point-to-point links. However, the ACMA RRL database details the location of the static station for a fixed licence of the point-to-multipoint type but does not include the remote stations that communicate with the static station. Hence, the paths of the transmission vectors are not readily identifiable. As a result, consultation with the operators of nearby point-to-multipoint licences has been initiated, as summarised in section 2.3, with the intent of identifying the associated link paths in relation to the proposed Project and hence determining the potential for interference.

2.2.1.3 Other radiocommunication licences

OHTLs, switchyard infrastructure, and associated infrastructure may also theoretically cause interference to point-to-area style services such as radio and DTV broadcasting or mobile phone services through physical obstruction or reflection or scattering of the signals [4]. However, these services are typically designed to operate in the presence of obstructions and are therefore unlikely to be affected by the presence of electrical infrastructure. The potential for interference to point-to-area signals from the physical presence of such infrastructure depends on the locations of the infrastructure and receiving antenna with respect to the transmitted signal. On behalf of the Proponent, the Customer has advised that the nearest dwelling to the proposed Project is located more than 1 km from the OHTL route, at which distance impacts to television and radio broadcasting are generally considered unlikely [4]. The proposed OHTL route and switchyard locations are sufficiently far from radiocommunication transmission towers for DTV and radio signals to avoid any large-scale interference.

DNV is not aware of any evidence in the literature of the physical presence of OHTLs or switchyards causing significant interference to other types of services such as meteorological radar, global navigation satellite system (GNSS) signals, and satellite television or internet signals. Therefore, impacts to these services from the proposed Project are considered unlikely.

2.2.2 Interference caused by electromagnetic noise

Similar to interference caused by the physical presence of OHTLs, RFI caused by electromagnetic noise is generally only experienced within close proximity of the lines [4]. Given that the nearest dwelling (which is an associated dwelling) is located more than 1 km from the OHTL route, it is considered unlikely that RFI will be experienced at any dwellings in the vicinity of the Project. It is also expected that the proposed OHTL will be designed and maintained to minimise the potential for both corona and gap-type discharges, in order to reduce the associated electrical losses, and will be no more likely to cause RFI than other OHTLs operating at similar voltages.

2.3 Stakeholder consultation

DNV has contacted Aurizon, Optus, and Telstra to determine the likelihood that the proposed OHTL will cause interference to their point-to-point links crossing the OHTL. A response has been received from Optus who have confirmed that the proposed OHTL does not pose any risk of interference to their equipment or services. No response from Telstra regarding the proposed OHTL has been received to date.

The response received from Aurizon indicates a potential for interference to their three point-to-point links that cross the proposed OHTL route (links #1, #2, and #3).

DNV has also sought information from Aurizon regarding their point-to-multipoint licences with the intention of mapping the associated link paths and assessing the likelihood of interference arising from the OHTL. Aurizon has confirmed that several point-to-multipoint systems may be affected. They have provided additional information about the link paths, and further analysis will be required during detailed design to determine appropriate exclusion zones and to assess the potential for interference.

In addition, Aurizon has raised concerns about potential impacts on their other operational systems in the vicinity of the Project, including signalling infrastructure, train operations, and TETRA (mobile radio) communications.

Aurizon has requested that any proposed engineering solutions or mitigation measures developed to address these risks be submitted to them for review and consideration. DNV understands that the Proponent intends to continue engaging with Aurizon during the detailed design phase to identify and implement suitable mitigation strategies.

2.4 Mitigation options

If interference to Aurizon's point-to-point or point-to-multipoint links caused by the physical presence of the proposed OHTL and associated infrastructure is experienced after the Project is operational, potential mitigation options may include upgrading the equipment for the links, re-routing the links, installing additional towers, or replacing the affected links with alternative communications infrastructure.

If localised interference to Aurizon's mobile radio systems is experienced, this can potentially be addressed by the user relocating a short distance to achieve a clearer signal or, where appropriate, by using an external antenna to improve reception. Additional mitigation options may include increasing signal strength from the affected or nearby towers, or installing a signal repeater or an additional tower on the opposite side of the Project.

Any proposed mitigation measures to address impacts to Aurizon's communication and operational systems will need to be identified and agreed through consultation with the operator. The Proponent has advised that if interference to Aurizon's point-to-point or point-to-multipoint links is confirmed based on the Project's detailed design, mitigation options that would be considered, in consultation with Aurizon, include:

- adjusting the height of the existing radiocommunication towers
- rerouting the affected links, for instance by installing additional towers
- replacing affected links with alternative technologies.

Interference caused by electromagnetic noise is considered unlikely but can be avoided by designing and installing the OHTL using equipment that minimises the potential for corona and gap-type discharges, and performing regular maintenance to identify and repair loose or broken hardware and wires [4]. In the event that interference caused by electromagnetic noise is experienced after the OHTL are operational, the mitigation options outlined above for the relevant signal or service may be applicable.

3 CONCLUSIONS AND RECOMMENDATIONS

Broadcast towers and transmission paths around the Project were investigated to determine if EMI would be experienced as a result of the development and operation of the proposed OHTL and switchyard infrastructure. This assessment has been based on the concept design for the Project, and DNV has considered that the proposed OHTL could occupy the region between 8.5 m and 50 m AGL. The results of the assessment are summarised in Table 2.

In its current configuration, based on the assessment presented here and advice received from the operators of nearby radiocommunication assets, the proposed OHTL has the potential to interfere with Aurizon's point-to-point and point-to-multipoint links crossing the proposed OHTL route. Aurizon have also raised concerns regarding their other communication services surrounding the Project and have asked for any mitigation solutions to be shared with them for review. DNV understands that that the Proponent intends to continue engaging with Aurizon during the detailed design phase to identify and implement suitable mitigation strategies if interference is confirmed based on the Project's detailed design.

Optus has confirmed that they do not anticipate any interference to their point-to-point link crossing the proposed OHTL. Telstra has not yet provided a consultation response; interference to Telstra's point-to-point link crossing the proposed OHTL is considered unlikely, but further information would be required to determine whether there is any potential for interference to the links associated with their nearby point-to-multipoint licences.

Sincerely
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[8] (18 September 2025). *30247470-01_A - Concept Design Report.pdf.* Downloaded from Sharepoint provided by R. Weightman (AECOM) to E. Tomlinson (DNV).

[9] (10 April 2026). Information within email from R. Weightman (AECOM) to N. Brammer (DNV).

APPENDIX A EMI ASSESSMENT TABULATED DATA AND MAPS

Table 2 Summary of EMI assessment results for the Project

Licence or service type	Results of DNV assessment	Stakeholder feedback (to date)	Potential for interference	Potential mitigation options (to be confirmed in consultation with the relevant operator)
Radio-communication towers	1 tower within 2 km of proposed OHTL route, hosting point-to-point links operated by: Aurizon Network Pty Ltd (Aurizon) Nearest tower: 169 m from proposed OHTL route	**Aurizon:** see feedback for point-to-point links	**Point-to-point links:** see findings for point-to-point links	**Point-to-point links:** see mitigation for point-to-point links
Fixed point-to-point links	8 links crossing proposed OHTL route, operated by: Aurizon Optus Mobile Pty Ltd (Optus) Telstra Corporation Limited (Telstra) **Aurizon links:** OHTL intersects the diffraction exclusion zone calculated by DNV for link #3 in the vertical plane – the diffraction exclusion zone at the point where the OHTL crosses the link spans approximately 14 m to 21 m AGL[1] **Telstra link:** OHTL is clear of all relevant interference zones **Optus links:** OHTL is clear of all relevant interference zones	**Aurizon:** high potential for interference to all links crossing the OHTL route (links #1, #2, and #3) **Optus:** no concerns raised **Telstra:** no response received	**Aurizon:** potential for interference to link #3 (based on DNV assessment), potential for interference to links #1, #2, and #3 (based on operator feedback) **Telstra:** unlikely to cause interference **Optus:** none	**Aurizon:** modify heights of radiocommunication towers, reroute affected links, install additional towers, replace affected links with alternative technologies **Telstra:** if interference is confirmed through detailed design - reroute affected links, install additional towers, replace affected links with alternative technologies **Optus:** none required
Fixed point-to multipoint links	3 base stations within 20 km of Project boundary Operated by Aurizon and Telstra	**Aurizon:** high potential for interference **Telstra:** no response received	Potential for interference if link paths cross the OHTL route	If interference is confirmed through detailed design - reroute affected links, install additional towers, replace affected links with alternative technologies

1. The tool used to extract the diffraction exclusion zone dimensions in the vertical plane calculates the zone heights at fixed points along the link path. The nearest calculation point, which was used to determine the diffraction exclusion zone heights quoted here, is approximately 15 m from the point at which the OHTL crosses the link path.

Table 3 Details of radiocommunication towers located within 2 km of the proposed OHTL

Site ID	Operator	Licence/service types	Distance to OHTL [m]
460376	Aurizon Network Pty Ltd	Point-to-point links	169

Table 4 Details of point-to-point links crossing the proposed OHTL

Link no.	Licence number	Assignment ID	Frequency [Hz]	Licence owner
1	10427054/1	3625524	7449000000	Aurizon Network Pty Ltd QR Network Pty Ltd Attn: Scott Andrews GPO Box 456 Brisbane QLD 4031
		3625525	7449000000	
		3625522	7610000000	
		3625523	7610000000	
2	10958357/1	6803063	7435000000	
		6803064	7435000000	
		6803061	7596000000	
		6803062	7596000000	
3	10958358/1	6803067	10775000000	
		6803068	10775000000	
		6803065	11265000000	
		6803066	11265000000	
4	10061322/1	1718210	6123100000	Optus Mobile Pty Limited 4G TXN 1 Lyonpark Road Macquarie Park NSW 2113
		1718211	6123100000	
		1718208	6375140000	
		1718209	6375140000	
5	1917226/1	1290998	5974850000	
		1290999	5974850000	
		1290996	6226890000	
		1290997	6226890000	
6	1917232/1	1291010	5945200000	
		1291011	5945200000	
		1291008	6197240000	
		1291009	6197240000	
7	1985899/1	1001406	6063800000	
		1001407	6063800000	
		1001404	6315840000	
		1001405	6315840000	
8	1462241/1	819570	1496000000	Telstra Limited Telstra - Radio Transport Engineering Locked Bag 3501 Brisbane QLD 4001
		819571	1496000000	
		819572	1435500000	
		819573	1435500000	

Table 5 Details of point-to-multipoint licences within 20 km of the proposed OHTL

Assignment ID	Site ID	Licence no.	Latitude [GDA94]	Longitude [GDA94]	Distance to Project [km]	Licence owner
798264	460377	1405742/1	-24.1378	150.7284	8	
798267	460377	1405742/1	-24.1378	150.7284	8	Aurizon Network Pty Ltd QR Network Pty Ltd Attn: Scott Andrews GPO Box 456 Brisbane QLD 4031
798268	16516	1405743/1	-24.1991	150.7600	12	
798271	16516	1405743/1	-24.1991	150.7600	12	
798625	16504	1406299/1	-24.1458	150.7329	9	Telstra Limited Telstra - Radio Transport Engineering Locked Bag 3501 Brisbane QLD 4001
798622	16504	1406299/1	-24.1458	150.7329	9	

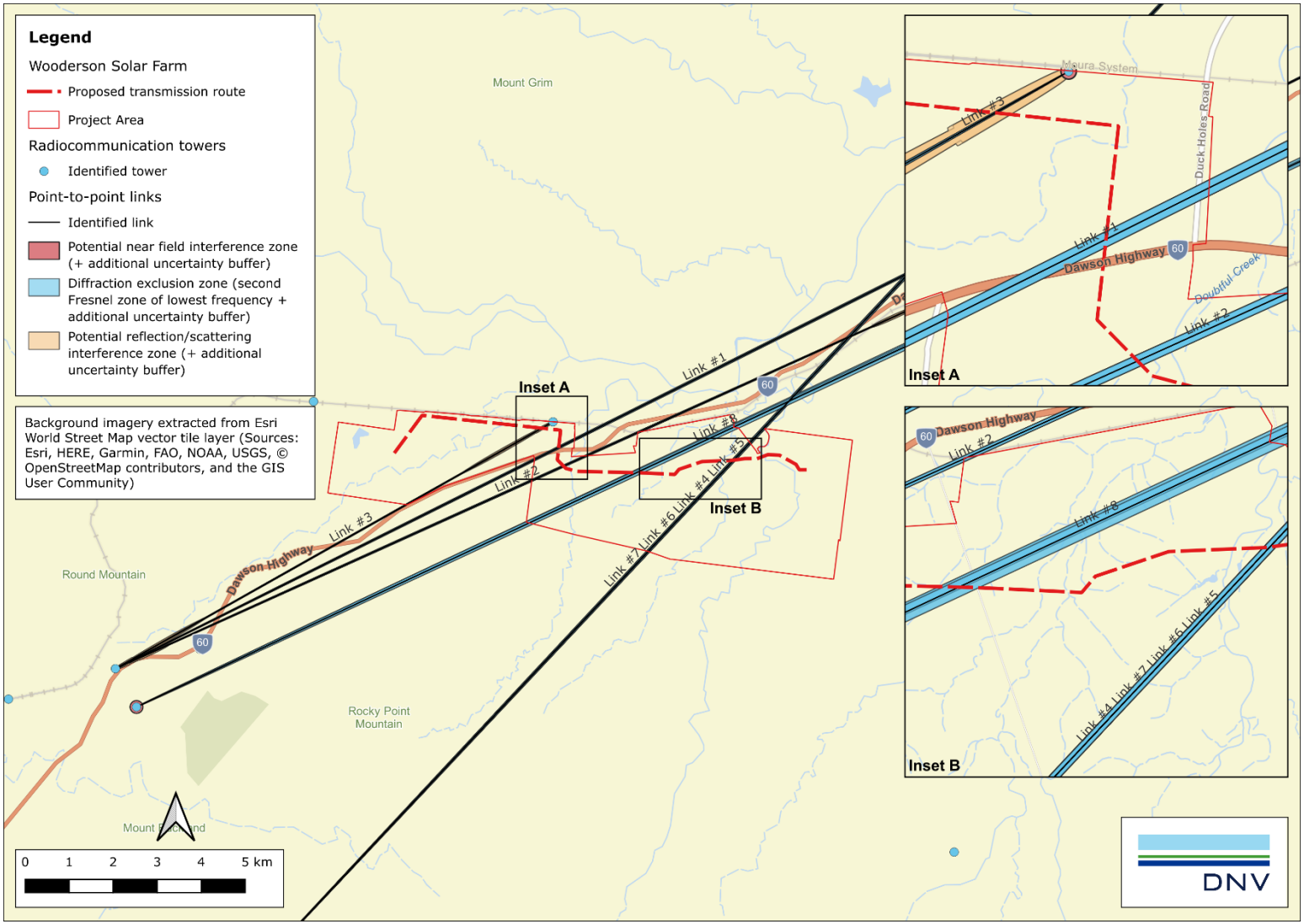


Figure 8 Overview of the Project and calculated point-to-point interference zones

Appendix K

Flood Assessment and Stormwater Management Plan

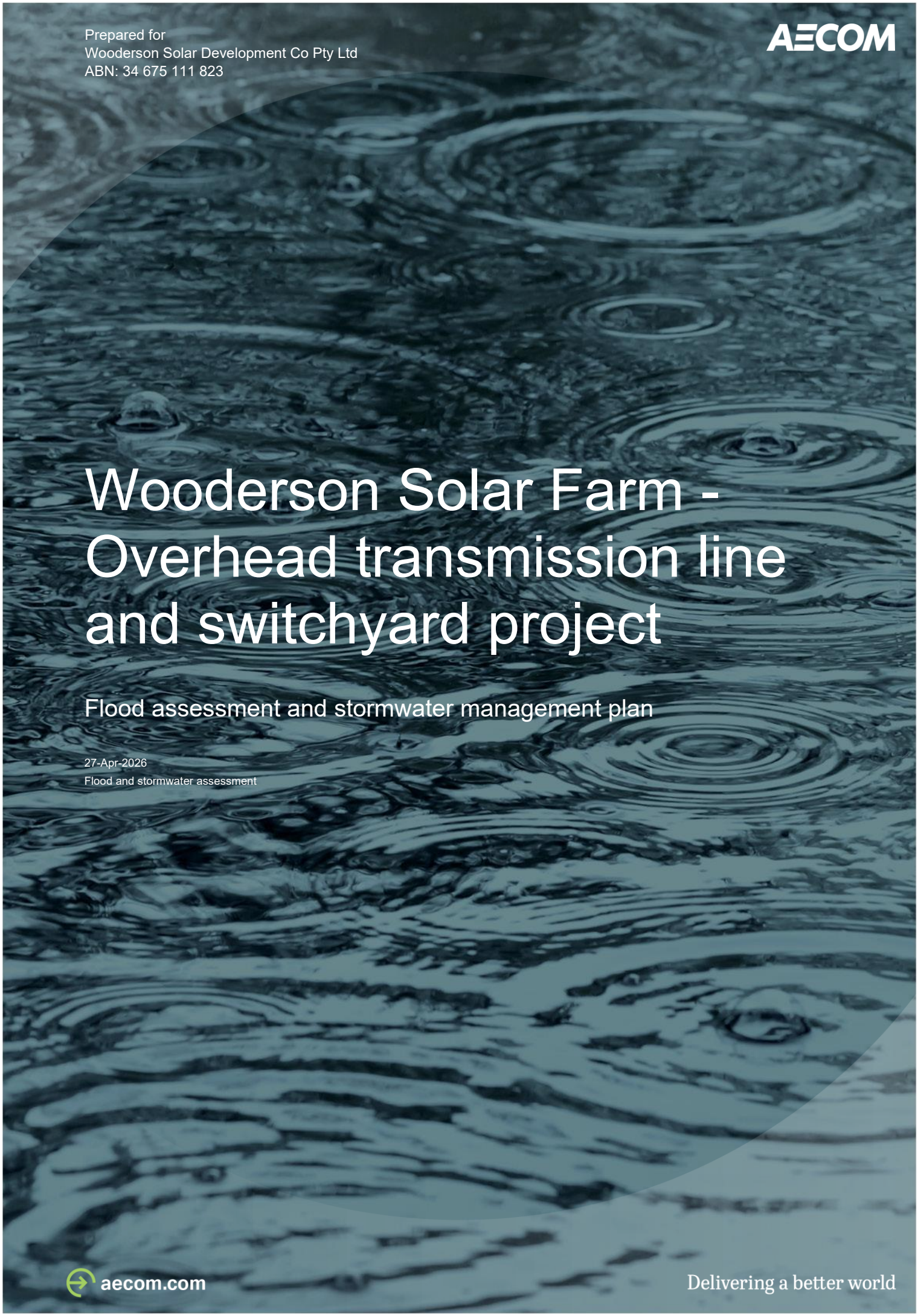
Prepared for
Wooderson Solar Development Co Pty Ltd
ABN: 34 675 111 823

AECOM

Wooderson Solar Farm - Overhead transmission line and switchyard project

Flood assessment and stormwater management plan

27-Apr-2026
Flood and stormwater assessment



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Flood assessment and stormwater management plan

Client: Wooderson Solar Development Co Pty Ltd

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Table of Contents

1.0 Introduction 1
1.1 Terms and definitions 3
1.2 Project overview 4
1.2.1 Overhead transmission line 6
1.2.2 Switchyard 8
1.2.3 Site access and internal access tracks 9
1.3 Construction 10
1.3.1 Timeframes 10
1.3.2 Workforce and construction hours 10
1.3.3 Field activities 10
1.3.4 Site set out 11
1.3.5 Laydown and construction compound 11
1.3.6 Infrastructure crossings 11
1.3.7 Plant and equipment 11
1.4 Demobilisation and rehabilitation 12
1.5 Operation and maintenance 12
1.6 Decommissioning 12
2.0 Methodology and objectives 13
2.1 Available data 16
2.2 Previous flood study 16
2.3 Flood assessment scope 16
2.4 Stormwater management scope 18
2.5 Regulatory framework 18
2.6 Limitations and assumptions 20
3.0 Stormwater management plan 21
3.1 Stormwater quantity management 21
3.2 Stormwater quality management 21
3.3 Sediment and erosion control 22
4.0 Flood assessment 23
4.1 Modelling approach 23
4.2 Hydrologic modelling 23
4.3 Hydraulic modelling 27
4.3.1 Hydraulic model setup 27
4.4 Results 34
4.4.1 Hydrology 34
4.4.2 Hydraulics 35
5.0 Development outcomes for assessable development 52
5.1 Gladstone Regional Council Planning Scheme 2015 52
5.2 Callide Infrastructure Corridor State Development Scheme (Sep 2012) 70
6.0 Conclusions and recommendations 72
6.1 Recommendations 73
7.0 References 74

Appendix A
Flood maps A

Appendix B
Flood levels B

List of Tables

Table 1 Terms and definitions 3
Table 2 Current and ear-term climate change factors for the rainfall 24
Table 3 Inflow source update 26
Table 4 Hydraulic model parameters 27
Table 5 Material roughness 27

Table 6 Cross drainage structures for the extended model 33
Table 7 Waterway crossings 37
Table 8 Peak flood levels (m AHD) at monopoles 38
Table 9 Peak flood levels (m AHD) at waterways 38
Table 10 Peak flow velocity (m/s) at monopoles 46
Table 11 Peak flow velocity (m/s) at waterways 46
Table 12 Combined hazard curves - Vulnerability threshold classification limits 47
Table 13 Peak flood hazard category at monopole 48
Table 14 Peak flood hazard category at waterways 48
Table 15 Rural zone code 53
Table 16 Development design code 54
Table 17 Flood hazard overlay code 60
Table 18 State Code 1: Development in a State-controlled road environment 67
Table 19 State Code 2: Development in a railway environment 69
Table 20 Flood maps A-1
Table 21 Estimated levels m AHD B-1

List of Figures

Figure 1 Wooderson Solar Farm overhead transmission line location 2
Figure 2 Wooderson Solar Farm overhead transmission line approvals context 2
Figure 3 Proposal plan – DA2 5
Figure 4 Proposal plan – DA3 6
Figure 5 Example 275 kV OHTL under construction (Cowell Electric, 2025) 7
Figure 6 Example 275 KV OHTL (Australian Power Industry Partners, 2025) 7
Figure 7 275 kV Example OHTL with access track (Cowell Electric, 2025) 8
Figure 8 Example Powerlink switchyard (Cowell Electric, 2025) 9
Figure 9 Proposed access track and laydown areas 14
Figure 10 Proposed switchyard and laydown areas 15
Figure 11 Extent of flood assessment 17
Figure 12 Catchment delineation used in hydrology 25
Figure 13 Material roughness 28
Figure 14 Updated model boundary 29
Figure 15 Model boundary condition and topography 30
Figure 16 Cross drainage structures 32
Figure 17 Increase in Peak Flow Rates due to Climate Change factor 34
Figure 18 Increase in Peak Runoff for each 1% AEP 12 hr temporal pattern 34
Figure 19 Estimated Existing Critical Duration Analysis for 1% AEP Storm Events 36
Figure 20 Waterway classification 39
Figure 21 Estimated existing peak flood depth for 1% AEP storm events 40
Figure 22 Monopoles NP26 and NP27 access tracks 42
Figure 23 Estimated existing flood extents 44
Figure 24 Estimated existing peak flow velocity for 1% AEP storm events 45
Figure 25 General flood hazard vulnerable curve 47
Figure 26 Estimated existing peak flood hazard category for 1% AEP storm events 49
Figure 27 Estimated existing peak flood extent for 1% AEP and 1 in 500 storm events 51
Figure 28 Callide Infrastructure Corridor State Development Scheme 71
Figure 29 Level extracted location B-1

1.0 Introduction

The proposed Wooderson Solar Farm is located approximately 40 kilometres (km) south-west of Gladstone in Central Queensland, within the Gladstone Regional Council (GRC) Local Government Area (LGA). The Proponent is Wooderson Solar Development Co Pty Ltd, a wholly owned subsidiary of Central Queensland Power Development Co Pty Ltd (CQP), which is a joint venture between RES Australia Pty Ltd (RES) and Energy Estate (CQP) Holdings Pty Ltd as trustee for Energy Estate (CQP) Holdings Trust (Energy Estate).

The solar farm is proposed to have a generating capacity of up to 450-megawatts (MW) with a 450 MW direct current (DC) coupled battery energy storage system (BESS) with storage capacity of up to 3,600 megawatt-hours (MWh). This will be connected to the National Electricity Market (NEM) through a new overhead transmission line and will also include construction of associated infrastructure including access tracks, fencing and operations and maintenance facilities.

The solar farm, BESS and associated infrastructure will be assessed in a Development Application (DA) by the State Assessment and Referral Agency (SARA), identified as Development Application 1 (DA1) and does not form part of this assessment.

The works outlined in this assessment include connection to the NEM through a 275 kilovolt (kV) overhead transmission line (OHTL), switchyard and associated ancillary infrastructure for these elements only (the Project). A total of approximately 11 km of OHTL supported by approximately 45 monopoles is proposed from the solar farm substation (assessed in DA1) to the new switchyard for connection to Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project.

The Project extends over 7 allotments (refer Figure 1), within the GRC LGA, 7 of which (including part Lot 1 on RP616641) are subject to assessment under the Gladstone Regional Council Planning Scheme 2015 (Version 2.1) (Planning Scheme) and one allotment (part Lot 1 on RP616641) requiring assessment under the Callide Infrastructure Corridor State Development Area (SDA) subject to the Callide Infrastructure Corridor State Development Area Development Scheme (September 2012) (Development Scheme).

As the OHTL extends across 2 planning instruments (refer Figure 2), the assessment provided within this report will support 2 separate DAs:

- Development Application 2 (DA2) – Transmission Corridor and Switchyard within the GRC LGA to be assessed by GRC with referral to concurrence and advice agencies.
- Development Application 3 (DA3) – Transmission Corridor within the Callide Infrastructure Corridor SDA to be assessed by the Office of the Coordinator General (OCG).

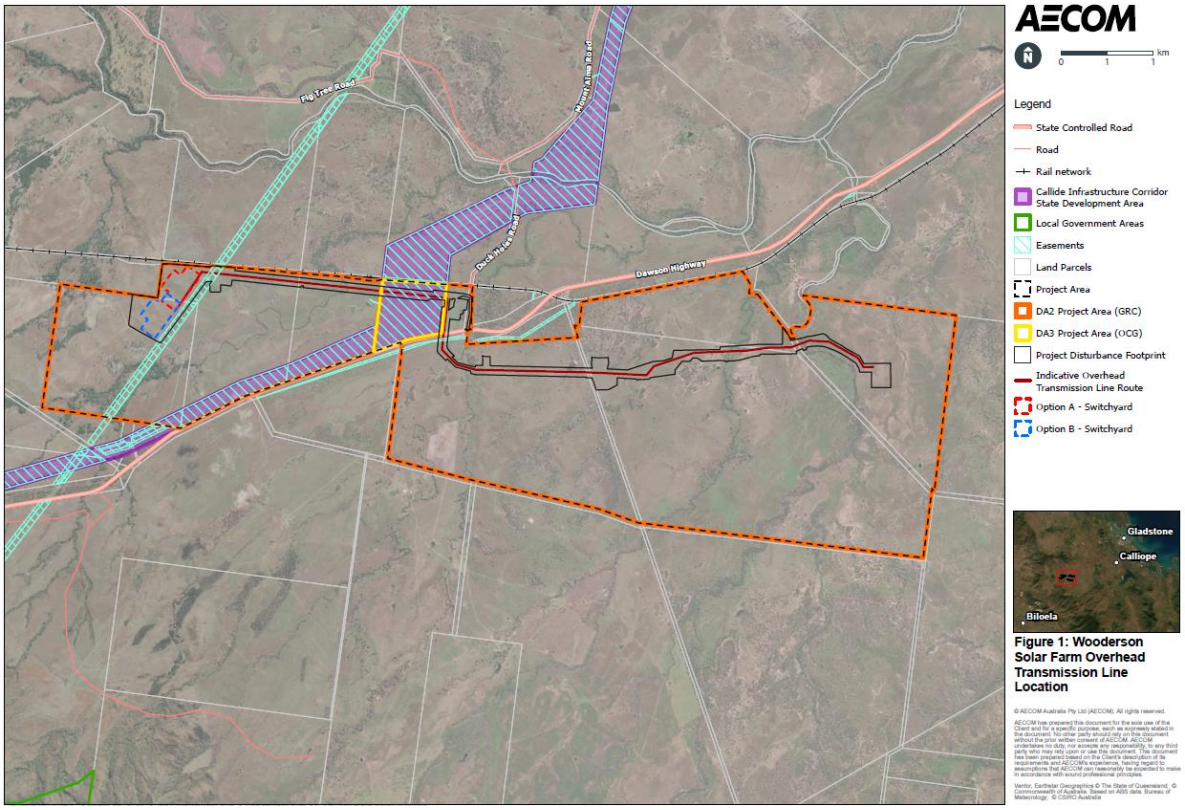


Figure 1: Wooderson Solar Farm Overhead Transmission Line Location

Figure 1 Wooderson Solar Farm overhead transmission line location

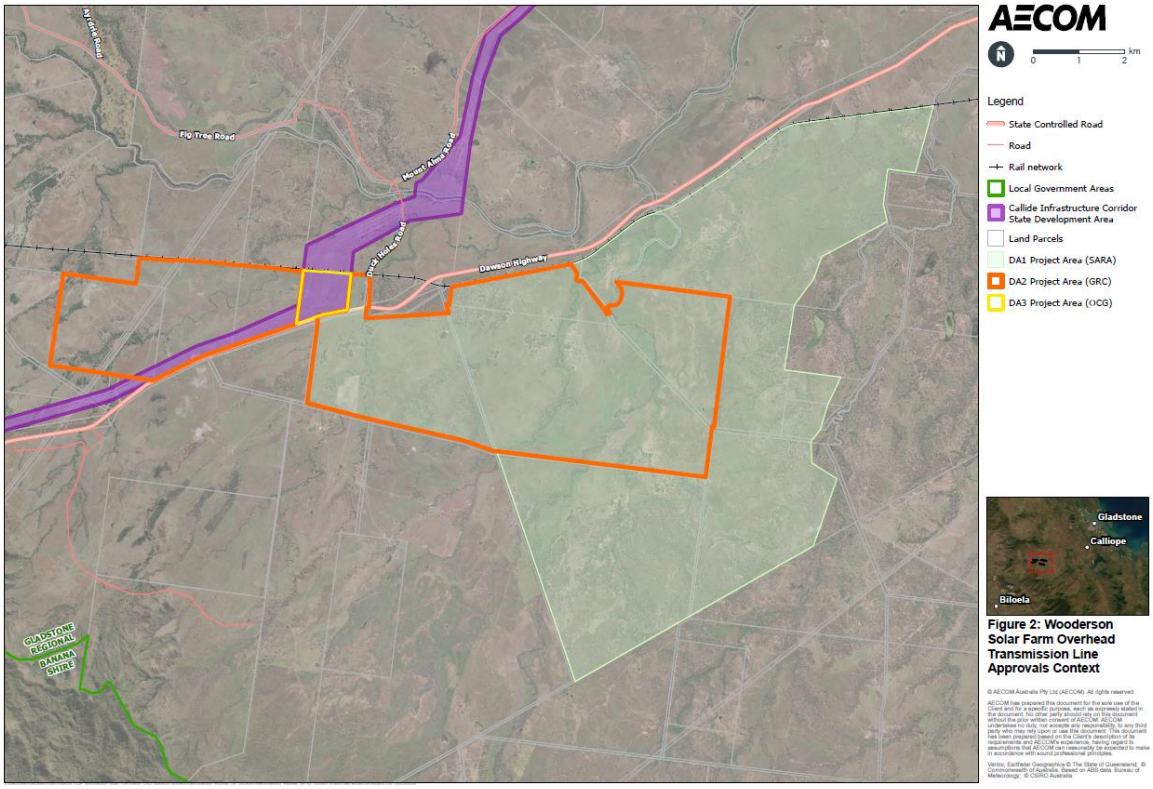


Figure 2: Wooderson Solar Farm Overhead Transmission Line Approvals Context

Figure 2 Wooderson Solar Farm overhead transmission line approvals context

1.1 Terms and definitions

The acronyms and definition listed in Table 1 are used in this report.

Table 1 Terms and definitions

Term	Acronym Expansion	Definition
1-sec SRTM	1 second Shuttle Radar Topography Mission	-
ADR	Australian Disaster Resilience	-
AEP	Annual Exceedance Probability	The probability that a given event will be exceeded in any one year.
AHD	Australian Height Datum	Australian Height Datum is the official vertical height datum of Australia. Levels relative to this datum are in general terms the elevations above mean sea level.
ARR	Australian Rainfall and Runoff	National guidelines for hydrologic modelling and assessment of rainfall.
ARR 2019	Australian Rainfall and Runoff Guidelines – 2019 Edition	2019 edition of ARR.
CC	Climate Change	Long-term shifts in temperature and weather patterns.
DA	Development Approval	-
DFE	Defined Flood Event	The flood event selected for the management of flood hazards for a specific development location, often determined by the appropriate authority
DPI	Department of Primary Industries	-
ESCP	Erosion and Sediment Control Plan	-
IFD	Intensity-Frequency-Duration	Data for rainfall depths (mm) for different theoretical events.
LiDAR	Light Detection and Ranging	A method for determining distances by targeting an object with a laser and measuring the time for the reflected light to return to the receiver. It is used to make digital 3D representations of terrain or bathymetry.
m	metres	
m AHD	meters above Australian Height Datum	Elevation reference to Australian Height Datum, indicating elevation relative to mean sea level in Australia
m/s	Meter per second	International System of unit to measure speed and velocity.
OCG	Office of the Coordinator General	-
OHTL	Overhead Transmission Line	-

Term	Acronym Expansion	Definition
RCBC	Reinforced Concrete Box Culvert	-
RCP	Reinforced Concrete Pipe	-
RFFE	Regional Flood Frequency Estimation	
SDA	State Development Area	
SQP	Suitably Qualified Persons	
SSPs	Shared Socio-economic Pathways	SSPs are the climate change scenarios of projected socioeconomic global changes up to 2100. The SSPs can be combined with RCPs which imply different levels of mitigation, with implications for adaptation.
TP	Temporal Pattern	The distribution of rainfall with respect to time.
URBS	Unified River Basin Simulator	A software use for flood forecasting and design flood studies.

1.2 Project overview

The Project is for the purposes of connecting the solar farm and BESS to the NEM and comprises of the following components:

- Approximately 11 km of 275 kV OHTL, contained within a 60 metre (m) wide easement, discussed further in Section 1.2.1
- New switchyard for connection to Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project, discussed further in Section 1.2.2
- Access tracks, discussed further in Section 1.2.3
- Temporary laydown and construction compound areas, discussed further in Section 1.3.5.

For the purposes of this application, the following has been used to define the Project to delineate between permanent impact areas and temporary impact areas and are defined as follows (refer Figure 3 and Figure 4):

Project area:

The Project infrastructure and vehicular access will be situated within the bounds of the 'Project Area' which comprises of freehold allotments, Dawson Highway Road Reserve, Duck Holes Road Reserve and two unnamed road reserves. The Project Area has a total area of 2675.91 hectares (ha).

Project disturbance footprint:

The Project Disturbance Footprint is estimated to be 209.619 ha, is defined as including permanent and temporary components for construction:

Permanent components include the following:

- Approximately 11 km of 275 kV OHTL, contained within a 60 m wide easement
- Approximately 45 monopoles, contained within the 60 m wide easement
- New switchyard (either Option A or Option B)
- Access tracks located within the 60 m wide easement that will be used for ongoing maintenance
- Access tracks (where located outside the easement) that will be used for ongoing maintenance

- Vegetation clearing
- Security fencing.

Temporary components include the following:

- Option A and Option B switchyard construction compound area
- Option A and Option B switchyard temporary laydown area
- Vegetation clearing.

The Project Disturbance Footprint includes a buffer around the proposed infrastructure to allow for design refinement during detailed design.

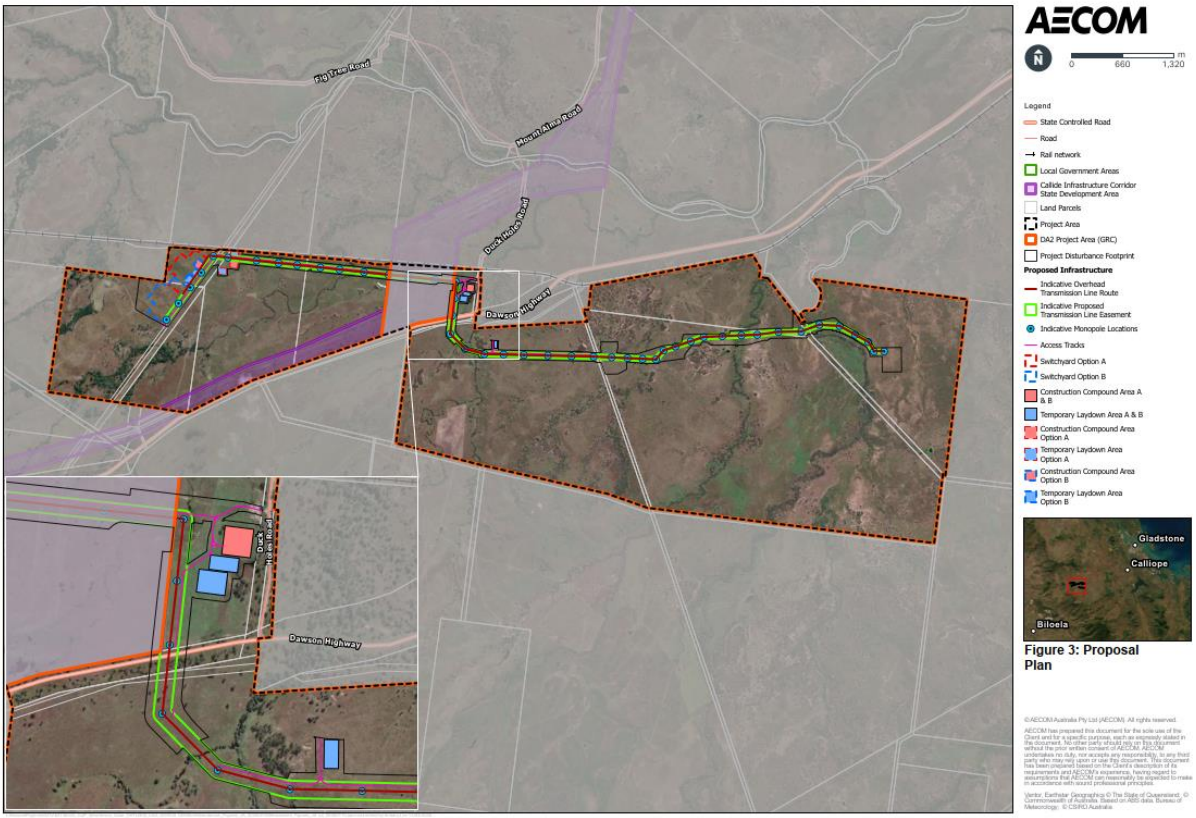


Figure 3: Proposal Plan

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Figure 3 Proposal plan – DA2

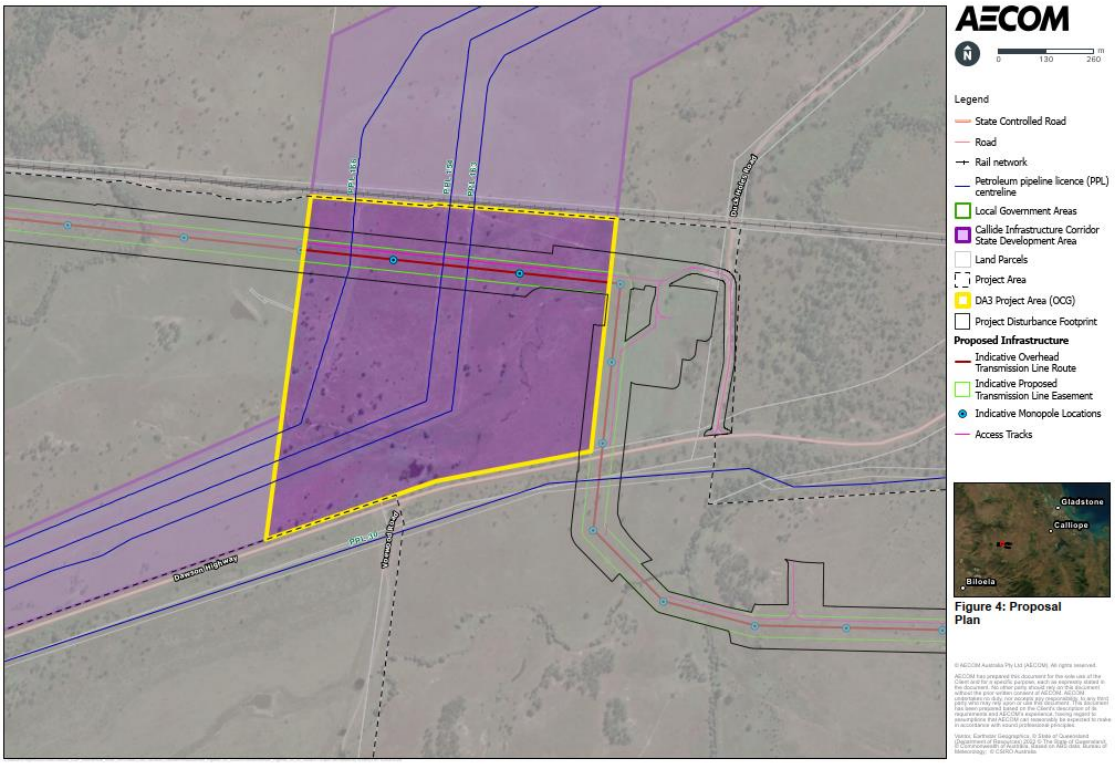


Figure 4 Proposal plan – DA3

1.2.1 Overhead transmission line

The proposed OHTL extends approximately 11 km from the solar farm substation, traverses west to the proposed new switchyard and connects into the Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project.

The OHTL will be contained within a 60 m wide easement (refer Figure 3 and Figure 4). The OHTL will be located with the jurisdiction of the Planning Scheme and Development Scheme (refer Figure 2). The following delineates between the infrastructure and works located each jurisdiction:

The OHTL within the Planning Scheme jurisdiction will:

- Traverse 7 freehold allotments.
- Comprise approximately 10 km of OHTL.
- Be partly within and adjoining powerlink's proposed calvale to calliope river transmission line reinforcement project and calvale to wurdong 275kv transmission line, where the ohtl will under cross the existing and proposed transmission lines.
- Travel adjacent to option a and option b switchyard, construction compound and construction laydown area, which also adjoins the calvale to calliope river transmission line reinforcement project.
- Require approximately 43 monopoles with a maximum height of 50 m. The monopoles will be constructed of either steel or concrete. Monopoles will have a foundation radius of approximately 15 m, with some monopoles (particularly corner monopoles) requiring stays. The final requirements for stays will be confirmed during detailed design. Refer to Figure 5, Figure 6 and Figure 7, depicting indicative monopoles Figure 3 and Figure 4 for indicative monopole locations.

  It is noted that these are indicative locations only and will be subject to refinement during detailed design which will take into account impact assessment findings and approval requirements.

The OHTL within the Development Scheme jurisdiction will:

- Traverse one freehold allotment.
- Approximately 840 m of OHTL.
- Traverse an easement containing gas pipelines and located within the development scheme.
- Require up to 2 monopoles with a maximum height of 50 m. The monopoles will be constructed of either steel or concrete. Monopoles will have a foundation radius of appropriately 15 m, some monopoles particularly corner monopoles requiring stays. The foundations of a third monopole may partially be located within the development scheme jurisdiction, with the centre of the pole located immediately west of the development scheme jurisdiction. Refer to Figure 5, Figure 6 and Figure 7, depicting indicative monopoles Figure 3 and Figure 4 for indicative monopole locations.



Figure 5 Example 275 kV OHTL under construction (Cowell Electric, 2025)



Figure 6 Example 275 KV OHTL (Australian Power Industry Partners, 2025)



Figure 7 275 kV Example OHTL with access track (Cowell Electric, 2025)

1.2.2 Switchyard

A new switchyard is proposed to be located at the western end of the OHTL for cut-in connection to Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project (Figure 3). The final location of this switchyard is awaiting confirmation from Powerlink, with two potential locations assessed for the purposes of this application being Option A (red) and Option B (blue) (Figure 3). Both options are proposed to be included within the Project Disturbance Footprint to allow for flexibility in the final location and allow for continued discussions with Powerlink.

The switchyard include a cleared level platform of approximately 170 m by 80 m for connection of Wooderson Solar Farm, subject to confirmation with Powerlink. There will also be space for potential future expansion contained within a security fence. It will include switchgear to isolate circuits in an emergency, as well as devices to monitor and communicate the performance or circuits.

The Project Disturbance Footprint includes the maximum possible area required for the switchyard.

The switchyard will ultimately be transferred to the ownership of Powerlink, the Transmission Network Service Provider. This is anticipated to occur upon commissioning of the switchyard, however the timing is subject to confirmation with Powerlink. An example of a Powerlink switchyard shown in Figure 8 below.



Figure 8 Example Powerlink switchyard (Cowell Electric, 2025)

1.2.3 Site access and internal access tracks

A proposed new direct access from the Dawson Highway is not proposed as part of DA2 and DA3, however direct assess has been proposed as part of DA1.

DA2 will utilise the proposed new access from the Dawson Highway and will provide construction and maintenance access to the southern Project Area.

To limit disturbance, internal access within the southern section of the Project Area will use the approved access tracks as part of DA1, with the exception of some additional sections that will provide specific access to the OHTL. These additional access tracks will be up to 7 m wide in accordance with Powerlink access track specifications and are shown on Figure 3 and Figure 4 .

Access to the Project Area to the north of the Dawson Highway will be via Duck Holes Road and predominantly within the 60 m wide easement. These access tracks will also be up to 7 m wide in accordance with Powerlink access track specifications. Some sections are located outside the easement to provide access to switchyard Option A and Option B Construction Compound Area and switchyard Option A and Option B Temporary Laydown Area.

Access to the switchyard will be via Duck Holes Road and either via the same track within the OHTL easement, or via a second track immediately adjacent to the OHTL easement. This will be confirmed with Powerlink during detailed design.

Access tracks may cross waterways or watercourses within the Project Area. Where required, culverts will be installed. Where achievable, these will be designed in accordance with the Accepted Development Requirements for operational work that is constructing and raising Waterway Barrier Works (dated September 2025 or as amended) or form part of secondary approvals during detailed design.

1.3 Construction

1.3.1 Timeframes

Construction of the OHTL and switchyard is estimated to take approximately 15 months. It is anticipated that these activities will commence at the same time and indicatively anticipated to commence in March 2029.

Construction timeframes will be dependent on securing Project approvals, timing and staging of construction of other assets including the solar farm and Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project.

Note that these timeframes are based on construction of the assets only. The OHTL will only commence export of electricity during commissioning of the solar farm.

1.3.2 Workforce and construction hours

Preliminary estimates of the construction workforce required for the Project will be up to 80 full time equivalent (FTE), comprising up to approximately 50 FTE for the switchyard and 30 FTE for the OHTL.

Construction activities will generally be limited to daylight hours and will vary depending on the season. However, it is expected that most works will occur during standard construction hours of 7 am to 6 pm, Monday to Saturday.

During certain construction activities, works may be required to be undertaken outside of standard hours (i.e. Sunday or night-time periods). In these instances, appropriate mitigation and management measures will be incorporated into the Construction Environmental Management Plan (CEMP). The CEMP will serve as an overarching management plan that will manage and monitor impacts during construction.

1.3.3 Field activities

The list below provides a standard approach to the progression of construction activities that will occur for the Project:

- Site set out
- Pre-clearing survey
- Road and rail approvals
- Site establishment (construction compounds, laydown areas, equipment and materials)
- Installation of fencing, gates, grides and clean down bays
- Earthworks for access tracks and hardstand areas
- Vegetation clearing
- Monopole site benching
- Foundation installation
- Structure assembly and erection
- Conductor and earth wire stringing
- Commissioning of all components
- Reliability testing
- Rehabilitation of temporary disturbance areas
- Demobilisation.

Some deviation from the standard approach is anticipated for the sections of Project Disturbance Footprint intersecting gas pipelines. Subject to agreement with the pipeline owner, this may include:

- Temporary protection (i.e. matting, plates, exclusion fencing) over pipelines.

- Access and / or construction controls such as vehicle load limits, vibration restrictions, or controlled access tracks as required.
- Modified stringing set-up, if required, to avoid ground contact or maintain specific clearance over the pipeline.

1.3.4 Site set out

Following cadastral survey of the OHTL easement, the location of the OHTL within the easement will be set out. Structure sites will be marked and orientated using design information. Structure locations will be selected based on the technical characteristics of the structures and conductors, topographical constraints, landholder requirements and environmental considerations.

Easement boundaries will be identified, and the Project Disturbance Footprint will be marked prior to vegetation clearing.

1.3.5 Laydown and construction compound

Temporary ancillary facilities would be required during construction, and would typically include:

- Construction compounds involving a storage area, offices and meeting room, ablution facilities, canteen and parking.
- Laydown areas involving areas suitable for storing materials, plant and equipment.

While the construction compounds and laydown areas could be located anywhere within the Project Disturbance Footprint, 3 indicative construction compounds and 7 indicative laydown areas are identified in Figure 3 and Figure 4.

These facilities would be compacted with gravel to allow for all weather access. Once construction is complete, these areas would be revegetated or have infrastructure installed dependent on their location within the Project layout.

1.3.6 Infrastructure crossings

Road and rail:

The Project Disturbance Footprint will traverse 2 unnamed local road corridors and one state-controlled road (Dawson Highway). Whilst the Project Disturbance Footprint is located south of the Moura Railway, the Project does not intersect or traverse the railway corridor.

Transmission lines:

The Project Disturbance Footprint will be partly within and adjoining Powerlink’s proposed Calvale to Calliope River Transmission Line Reinforcement Project and Calvale to Wurdong 275 kV Transmission Line, where the OHTL will under cross the existing and proposed transmissions lines.

Gas pipelines:

The Project Disturbance Footprint will be partly within a gas pipeline easement within the Development Scheme. The easement contains gas pipelines owned by Santos GLNG Pty Ltd (Petroleum Pipeline Licence (PPL) 166), Australia Pacific LNG Gladstone Pipeline Limited (PPL 163) and APA WGP Pty Ltd (PPL 154).

1.3.7 Plant and equipment

The plant and equipment required for the construction of the Project would include:

- Earthmoving machinery and equipment for site preparation (such as excavators, compactors, rollers and graders)
- Pile-driving equipment (piling rigs)
- Specialised power line stringing equipment
- Cable trenching and laying equipment
- Forklifts and cranes
- Machinery and equipment for switchyard and inverter infrastructure establishment

- Manual tools, including compressed air and electric tools
- Water trucks for dust suppression
- Diesel generator/s
- Heavy vehicles, utility vehicles and light vehicles.

1.4 Demobilisation and rehabilitation

All disturbed areas impacted from construction will be reinstated at the end of construction through the implementation of the CEMP.

1.5 Operation and maintenance

During operation, normal practice is for maintenance staff to carry out scheduled inspections of the OHTL easement, switchyard and access tracks. Maintenance timing will depend on the risk of vegetation growth and the requirement for emergency repairs.

The Project will be operated in accordance with an Operational Environmental Management Plan (OEMP).

1.6 Decommissioning

At the end of the Wooderson Solar Farm's operational life, it is anticipated to either be upgraded (subject to additional planning approvals, as required) or decommissioned. The decommissioning of the solar farm would result in the OHTL being no longer required and so it will also be decommissioned. It is anticipated that switchyard would remain operational as a Powerlink network asset.

Decommissioning the OHTL will be in agreement with the landholders, and would involve removing infrastructure, returning the Project Area to its pre-existing land use as far as practicable, and easements maybe surrendered to the property owner. Some infrastructure such as access tracks may be retained where agreed with and beneficial to the landowner.

Where feasible and practical all dismantled and decommissioned infrastructure and equipment will be recycled. It is anticipated that more material would be recyclable by the end of the operational life than is currently possible, as recycling industries establish. Structures and equipment that cannot be recycled would be disposed of at an approved waste management facility in accordance with all statutory requirements.

Vehicle movements and personnel requirements during the decommissioning phase are expected to be similar or less than the construction phase.

2.0 Methodology and objectives

This report presents the stormwater management assessment and hydraulic modelling undertaken to evaluate flood behaviour within the Project Disturbance Footprint. While the solar farm is included for context, it does not form part of this assessment.

As part of the required technical assessments, flood and stormwater analysis have been conducted for the existing (pre-development) conditions.

The objective of this assessment is to understand flood behaviour within the Project Disturbance Footprint under existing conditions (Figure 3 and Figure 4). The results will inform ongoing design development to ensure that adverse impacts on local flooding and stormwater behaviour are avoided through appropriate design adjustment.

An overview of the current concept design layout is provided below.

- Monopole footprint: The proposed OHTL monopoles (NP1 to NP45).
- Access track assumptions: This study assesses existing flood behaviour only. Therefore, embankments or cross-drainage structures (e.g. culverts or causeways) are not included in the flood modelling. AECOM understands that detailed design information is not yet available, and the proposed culverts are going to be designed and constructed in accordance with ADR. There are 2 sets of access tracks, refer to Figure 9, as follows:
    - Access tracks outside the Project Disturbance Footprint are addressed as part of DA1 submission and not included in this study.
    - Transmission line proposed access track. The term “access track” in this report refers to the proposed access track for the Project, as shown in Figure 3. Any references to access-track requirements or recommendations should be interpreted as relating to the OHTL’s and switchyard’s proposed access track.
- A total of 3 laydown areas were identified: LA1, LA2 and LA3 (Figure 9), were assessed as part of this assessment.
- Switchyard location: The switchyard is proposed to be situated approximately 10 to 15 m above the adjacent waterway to minimise the likelihood of hydraulic interaction with local runoff and to reduce potential impacts on the nearby waterway. Figure 3 and Figure 10 show the proposed switchyard and associated laydown areas.

This assessment presents the findings based on the current Project design and existing flood behaviour. The intent is to evaluate the proposed features using existing-condition flood results and to recommend an approach that maintains minimal changes to local flood levels, flow paths, and stormwater hydrology. Based on the nature of the proposed development and the mitigation measures outlined in Section 6.1 of this report, an assessment founded on existing flood conditions is considered sufficient at this stage. Additional commentary has been included in Section 6.1 to outline the required culvert provision and key design considerations, including the requirement that culverts be designed to maintain existing flow behaviour and avoid adverse flood impacts.

Further details about the stormwater management and flood assessment are described in Section 3.0 and 4.0, respectively.

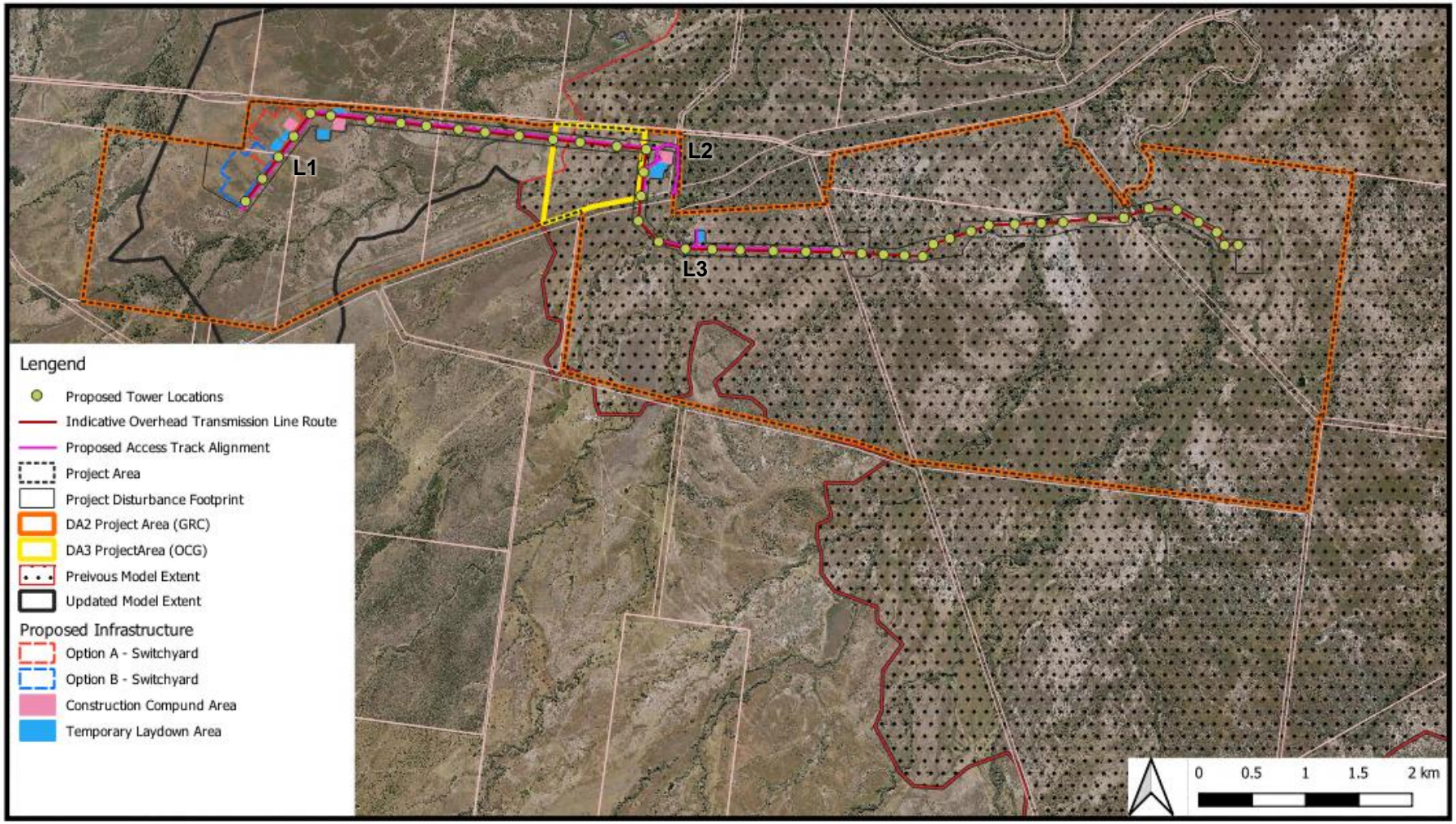


Figure 9 Proposed access track and laydown areas

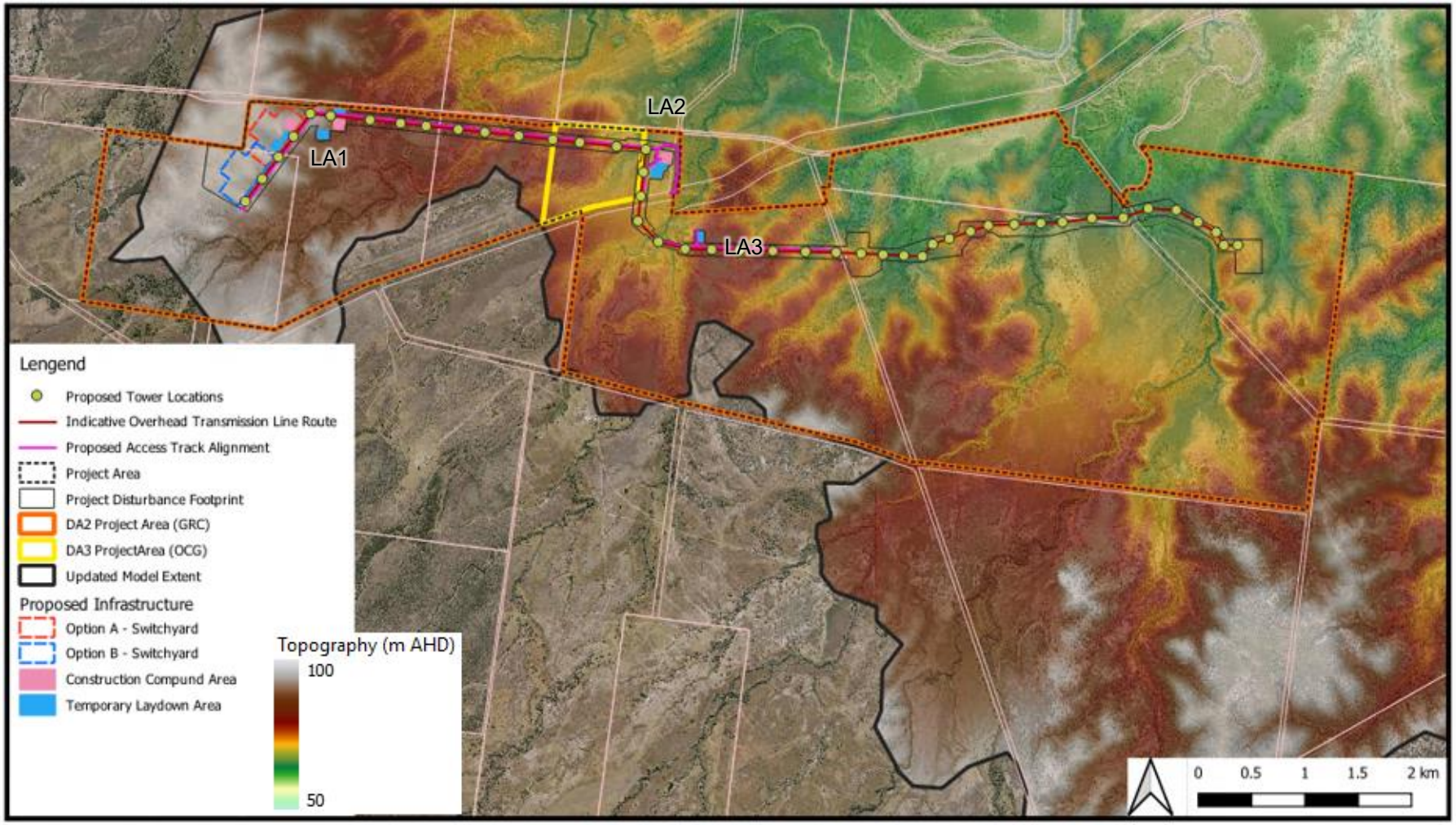


Figure 10 Proposed switchyard and laydown areas

2.1 Available data

The following data was available and has been incorporated into the baseline flood assessment:

- 1 m contours provided by Wooderson Solar Development Co Pty Ltd, dated September 2025
- A URBS hydrologic model, developed by WRM in 2025 as part of DA1, was available for this assessment
- 1 m Light Detection and Ranging (lidar) included in the received Hydraulic model (developed by WRM, 2025)
- TUFLOW model that was used in Wooderson Solar Farm, Surface Water Impact Assessment (refer Section 4.1)
- Shuttle Radar Topography Mission (1-sec SRTM) data was downloaded from https://elevation.fsdf.org.au website
- Rainfall data downloaded from ARR Data Hub; https://data.arr-software.org/.

2.2 Previous flood study

Hydrologic and hydraulic models were previously developed by WRM in 2025 to support the DA1 application for the proposed Wooderson Solar Farm (WRM, 2025). The WRM hydrologic model was adopted without modification for this assessment, while the hydraulic models developed in 2025 by WRM were adopted and updated to reflect the proposed transmission line works for the purposes of this flood impact assessment. AECOM understands that the accompanying technical reporting is currently being updated by WRM as part of the 2026 DA1 submission. At the time of undertaking this assessment, AECOM did not have access to the updated reporting.

Further details of the hydrologic and hydraulic models are provided in Sections 4.2 and 4.3, respectively.

2.3 Flood assessment scope

The scope of work for this flood assessment includes the following tasks:

- Extension of the hydraulic model boundary and amend inflows from northern catchments
- Extension of the hydraulic model boundary to account for the proposed access track, OHTL and its associated ancillary infrastructure within the project disturbance footprint (Figure 11)
- Revision of hydrographs to comply with Australian rainfall and runoff 2019 (arr2019) version 4.2 requirements and climate change considerations
- The hydrology results updated to the current climate in accordance with arr2019 version 4.2 requirements for climate change considerations, shared socioeconomic pathways. The median ssp2-4.5 scenario for the year 2030 has been adopted for this assessment
- Estimation of hydraulic parameters for the base case within the project area
- Summarise the findings in a report with accompanying maps, provide a general description of the modelling conditions, and identify any potential exiting flood risk within the project disturbance footprint.

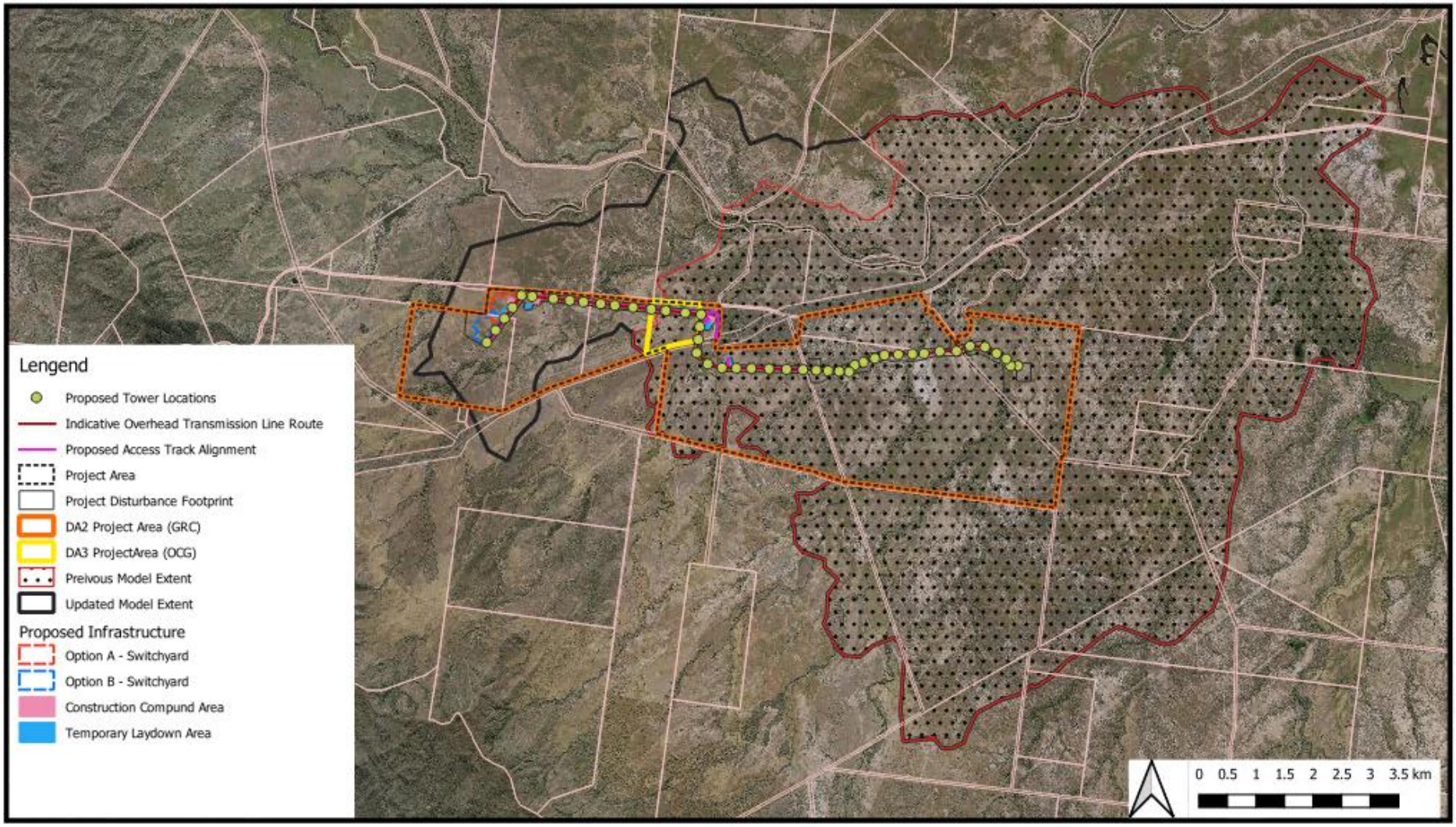


Figure 11 Extent of flood assessment

2.4 Stormwater management scope

This Stormwater Management assessment was undertaken to support the Project to address the following technical matters:

- Stormwater Quality Management
- Stormwater Quantity Management
- Erosion and Sediment Control.

As referenced from Planning Scheme and Development Scheme, the aim of the Stormwater Management Plan is to:

- Prevent or minimise adverse social or environmental impacts from stormwater runoff originating from the proposed OHTL works
- Achieve acceptable levels of stormwater runoff quality and quantity by providing inputs into the design development.

2.5 Regulatory framework

This section describes the regulatory framework (legislation, policies, and standards) at the Commonwealth, State and Local level that would apply to surface water management for the Project. In undertaking these assessments, the key overarching Acts and policies include:

Commonwealth

- *Environment Protection and Biodiversity Conservation Act 1999*
- *Great Barrier Reef Marine Park Act 1975*.

Queensland

- *Water Act 2000* (Water Act)
- *Water Supply (Safety and Reliability) Act 2008*
- *Water Regulation 2016*
- *Planning Act 2016* (Planning Act)
- *Planning Regulation 2017*
- *State Planning Policy* (SPP)
- *Fisheries Act 1994*
- *Marine Parks Act 2004*
- *Environmental Protection Act 1994* (EP Act)
- *Environmental Protection (Water and Wetland Biodiversity) Policy 2019* (EPP Water).

The following sections provide details of regulations that are specifically relevant to this current assessment including local regulations and policies.

Fisheries Act 1994

The *Fisheries Act 1994* aim to protect, develop and sustainably manage fisheries resources and fish habitats. It also regulates waterway barrier works which includes any temporary or permanent work modifications to existing waterways. These works may involve structures such as dams, weirs, culverts, causeways, bridges.

Planning Act 2016

The Planning Act establishes the overarching framework for assessing development within Queensland. It is supported by the Planning Regulation 2017, the SPP, and the Planning Scheme, all of which together guide the planning and development assessment process.

Planning Regulation 2017

The Planning Regulation 2017 defines the State's role in Development Assessment. The State Development Assessment Provisions (SDAP) are the assessment benchmarks used by the State in its role as Assessment Manager or Referral Agency.

Two State Codes are relevant to the Project, these are:

- State Code 1: Development in a State-controlled Road Environment
- State Code 2: Development in a Railway Environment.

State Planning Policy 2017

SPP sets out required outcomes for drainage, erosion control, water quality, and flood management during both construction and post-construction phases.

Drainage and Erosion Control

- Stormwater flows must be managed to prevent contamination of exposed soil areas
- Sheet flows must be controlled to minimise rill and gully erosion
- Temporary drainage works must provide stable flow paths sized to meet construction-phase design objectives:
    - Drainage structures: must convey at least the 10% Annual Exceedance Probability (AEP) event when the design life exceeds 24 months
    - Culvert crossings: must pass the 63% AEP event
- Sediment basin emergency spillways must provide capacity for the 2% AEP flood event.

Waterway Stability & Post-Construction Water Quality

Where post-construction measures are required, the design must achieve the following pollutant load reductions:

- 85% reduction in Total Suspended Solids
- 60% reduction in Total Phosphorus
- 45% reduction in Total Nitrogen
- 90% reduction in Gross Pollutants.

Flooding and Stormwater Quantity

- Earthworks and erosion and/or sediment controls must be implemented so that flood behaviour external to the site is not worsened, for all events up to and including the 1% AEP.

Contaminant and Waste Management

- Gross pollutants, litter, hydrocarbons, and similar contaminants must be removed from stormwater
- No oily residues or visible sheen are to be released to receiving waters
- Contaminated waste must be disposed of at authorised facilities.

Gladstone Regional Council Planning Scheme 2015

The Planning Scheme regulates the management of stormwater for the Project Area. It is noted that:

- The Project Area is not located within the GRC's Flood Hazard Investigation Area
- The Project Area is not mapped within the 1% AEP Calliope River flood hazard extent
- The Project Area is zoned Rural, and no Calliope River flood risk classification applies to the site.

The proposed development (DA2) constitutes Assessable Development and is subject to Impact Assessment pursuant to the Tables of Development.

Compliance with the Planning Scheme is achieved where the development satisfies the strategic intent and provisions of the relevant zone code, development codes and overlay codes, including the purpose, overall outcomes, performance outcomes, or acceptable outcomes prescribed therein. This report seeks to demonstrate compliance with the Planning Scheme in Section 5.0.

Callide Infrastructure Corridor State Development Scheme (Sep 2012)

The Development Scheme is the regulatory planning document that governs land use, development, and infrastructure activities within the Callide Infrastructure Corridor SDA in Central Queensland. The Development Scheme has been prepared pursuant to Section 79 of the *State Development and Public Works Organisation Act 1971* (SDPWOA).

The Development Scheme is applicable to the Project as part of the Project Disturbance Footprint traverses through the SDA and is subject to Impact Assessment (DA3). There are no specific Objectives in the Development Scheme related to flood or stormwater.

2.6 Limitations and assumptions

Key assumptions and limitations in this assessment are:

- Any use which a third party makes of this document, or any reliance on or decision to be made based on it, is the responsibility of such third parties. AECOM accepts no responsibility for damages, if any, suffered by any third party because of decisions or actions made based on this document.
- Where information has been supplied by the Proponent or other external sources, the information has been assumed correct and accurate unless stated otherwise. No responsibility is accepted by AECOM for incorrect or inaccurate information supplied by others.
- Revisions to the provided models are outside the scope.
- No changes were made to the hydrologic model. A truncated set of URBS sub-catchments (shown in the Figure 12 insert) was derived from the provided URBS model to evaluate the impact of the rainfall multiplication factor on runoff. This factor is proposed to adjust (scale up) 2016 Intensity-Frequency-Duration (IFD) curves to present (current climate, year 2030) condition using ARR2019 Version 4.2 climate change recommendation.
- Flow rates supplied to AECOM as hydraulic model inputs were retained for the amended model, with relevant updates applied as outlined in Section 4.2.
- The received model reviewed high level and updated added to the model in order to utilising the model for the purpose of this assessment.
- In this study, the existing conditions of the project area were assessed while considering the proposed layout for the Project. The results presented in this report are based on the flood behaviour under the current site conditions, along with recommendations informed by the proposed design layout.
- Due to lack of data, the details of the existing cross-drainage structure beneath the railway line were assumed.
- Model calibration and validation were excluded.

3.0 Stormwater management plan

The permanent and temporary components of the Project have been elaborated in Section 1.1 and will not be recapped in this Section.

3.1 Stormwater quantity management

The OHTL runs mainly across rural land and scattered areas of vegetation with no existing residential or ancillary structures within the Project Disturbance Footprint. The Moura Railway System is located to the north of the Project Disturbance Footprint. The Project Disturbance Footprint will traverse the across Dawson Highway and several natural streams.

The topography of the Project Disturbance Footprint is generally flat, and surface stormwater runoff primarily occurs as sheet flow towards the natural streams.

The Project Disturbance Footprint is approximately 155 ha. The area of the proposed access tracks is approximately 52,000 square metres (m^2) (assuming the width of tracks is 7 m) which represents approximately 3.6% of the Project Disturbance Footprint. The catchment contributed by the monopoles is considered negligible. The minor increase in surface runoff generated by the proposed monopoles and access tracks is considered negligible, given the small contribution in impervious areas mentioned above and the dispersed nature of the infrastructure relative to the size of the broader catchment. As for the switchyard, the increase in impervious area is expected to be up to a maximum of 155,100 m^2, or approximately 10% of the Project Disturbance Footprint. This change, however, is not a sole increase in catchment area. It is the percentage change of area from pervious with runoff coefficient 0.7 to impervious with runoff coefficient 0.87. Taking into account of the runoff coefficients, the increase in runoff is around 3%. As such, the impact is also considered as minimal.

Also, as the proposed monopoles have small, isolated footprints, the potential impacts on overland flow are low. Minor impacts may occur only where monopoles are positioned directly within the major flow paths, but these are expected to be limited due to the scale and distribution of the structures.

While the impacts to the existing drainage system are not expected to be substantial, the following measures are recommended to be considered in detailed design stage to minimise any potential adverse impacts due to the Project works:

- Avoid locating monopoles in locations influenced by natural streams and creeks to reduce the hydraulic impact of the monopoles on the natural streams and creeks. The influence of the natural streams and creeks can be found from the flood map shown in Section 4.0.
- Access track assumptions: Access tracks that cross minor flowpaths or ephemeral waterway will generally be constructed at existing ground level, with only minor local adjustments made to maintain natural sheet flow, thereby avoiding any flood impacts. Access tracks at moderate and high-risk waterway crossings (and low-risk waterway with culvert crossing requirement) will include dedicated culvert or floodway crossings, designed in accordance with the ADR, to improve trafficability. Potential flood impacts arising from this can be mitigated to an acceptable level through design. For example, this can be achieved by including sufficient culvert cells to reduce the concentration of flowpaths, lowering the invert level of the culvert cells or decreasing the elevation of these crossings. The final design of these crossings will be confirmed during the detailed design.
- While the two switchyard options are located at a high elevation (above 90 m) and intercept three existing low risk watercourses, some local drainage works may be required to safely drain runoff from the switchyard and divert the ephemeral watercourses running around it. Given the minor extent of these watercourses, the drainage works will be most likely be limited to minor perimeter drains.

3.2 Stormwater quality management

As outlined in Section 2.5, the SPP specifies the stormwater quality management requirements applicable to the Project.

Consistent with the stormwater quantity assessment, the impacts on the existing system with regards to stormwater quality are not expected to be substantial as the contribution of the areas to be disturbed by

the monopoles, access tracks and switchyard as calculated in Section 3.1 are not significant, particularly when those measures highlighted are adopted and implemented.

3.3 Sediment and erosion control

Implementation strategy

In Australia, the Best Practices in Erosion and Sediment Control (BPESC) outlines the development, implementation, instatement and monitoring requirements for Erosion and Sediment Control Plans (ESCPs) developed by Suitably Qualified Persons (SQP's).

Best practice management of sites involves both erosion and sediment control measures, executed via an ESCP.

A Preliminary Erosion and Sediment Control Plan was prepared in Dec 2025, including the extent of the Project. The following section outlines risks and corresponding mitigation measures during the Design, Construction and Operational Phases.

Design phase

Risks:

- Dusting effects are created from the access tracks and infrastructure areas
- Sediment is generated from the differences in levels of the infrastructure areas.

Mitigation measures:

- Access tracks and switchyard are proposed to be formed with a suitable pavement material which is generally stable to dust
- Batter slopes of landform features are proposed to be formed with either (i) a topsoil layer which allows vegetation to prevent sediment movement or (ii) armouring which is adopted to limit sediment mobilisation
- Where required, stormwater drains would be considered in association with the access tracks and infrastructure areas. Outlet rock armour pads are adopted as appropriate to mitigate the erosion potential.

Construction phase

Risks:

- Existing soils and vegetation are disturbed
- The construction traffic within the site increases.

Mitigation measures:

- ESC sequencing is developed so that erosion and sediment control measures are instated prior to construction works
- ESC devices such as sediment traps are implemented.

Operational phase

Risks:

- Hydraulic features may be blocked due to sedimentation
- Risk of progressive scour and erosion arises.

Mitigation measures:

- Management of the stormwater network, including ongoing inspection, monitoring and remediation, is continuously implemented
- Management of the road pavement surfaces and infrastructures area is continuously implemented.

4.0 Flood assessment

4.1 Modelling approach

A summary of the modelling approach is as follows:

1. The hydraulic model provided by the Proponent was originally developed by WRM in March 2025. AECOM adopted the same assumptions and extended the model where applicable.
2. The proposed layouts for the OHTL, switchyard, ancillary infrastructure, and access track for the current phase of work were provided for the flood modelling assessment.
3. The existing hydraulic model was extended to incorporate the Project Disturbance Footprint within the model boundary while maintaining the material roughness and the downstream boundary conditions.
4. The baseline climate conditions of the original model were derived from the 2016 IFD data. ARR2019 Version 4.2 advises updating these conditions to SSP2-4.5 for the year 2030. Accordingly, the recommended climate-change factors were applied and the hydraulic-model inflows adjusted. However, this update does not address climate conditions beyond 2030.
5. Refine the northern catchment and replace Calliope River Regional Flood Frequency Estimation (RFFE) based inflows with Unified River Basin Simulator (URBS)-generated inflows (Figure 12).
6. Simulate the hydraulic model for the following storm events:
    a. 10% AEP, 1% AEP and 0.2% AEP (1 in 500 AEP) event
    b. Duration of 3 hours (hr), 6 hr, 9 hr, 12 hr, 18 hr and 24 hr, as per the hydraulic model provided to AECOM
    c. Ten temporal patters for each event.

4.2 Hydrologic modelling

Hydrologic and hydraulic models were previously developed by WRM in 2025 to support the DA1 application for the proposed Wooderson Solar Farm (WRM, 2025). The WRM hydrologic model was adopted without modification for this assessment, while the hydraulic models developed in 2025 by WRM were adopted and updated to reflect the proposed transmission line works for the purposes of this flood impact assessment. AECOM understands that the accompanying technical reporting is currently being updated by WRM as part of the 2026 DA1 submission. At the time of undertaking this assessment, AECOM did not have access to the updated reporting.

A review of the assessment identified that the hydrologic model used to inform the hydraulic model was based on ARR19 Version 4.1. ARR19 Version 4.2 became current in August 2024 and was released to replace the guidance related to climate change considerations. The amended guideline (Book1, Chapter 6) incorporates the latest climate science and projections.

The received model showed that current climate conditions applied based on the IFD 2016. However, the latest ARR2019 update (Version 4.2) recommends using the year 2030 (midpoint) climate scenario for Current or Near-Term flood impact assessments.

In accordance with ARR2019 Version 4.2 Book 1, Chapter 6, and the ARR Data Hub, the recommended climate change factors for rainfall range between 1.10 and 1.14 (see Table 2). These factors are proposed to adjust (scale up) all 2016 IFD curves to represent present (year 2030) climate condition. All climate change updates have been applied to the inflow hydrograph used as input for the hydraulic model that was received.

To assess the influence of these rainfall multiplication factor on runoff, a truncated URBS model was simulated using the Storm Injector software.

Table 2 Current and ear-term climate change factors for the rainfall

Year	3 hr	4.5 hr	6 hr	9 hr	12 hr	18 hr	24hr
2030	1.14	1.13	1.12	1.12	1.11	1.1	1.1

Figure 12 illustrates the sub-catchment delineations incorporated in both Regional Flood Frequency Estimation (RFFE) and URBS hydrologic assessments. The truncated URBS sub-catchments (shown in the Figure 12 insert) were derived from the original URBS model, which was used to assess the influence of the rainfall multiplication factor on runoff.

In according with DA1 assessment outcomes, the adopted critical duration for the 1% AEP was 12 hr. This event was simulated in Storm Injector software using the truncated URBS model. The total runoff was estimated at location Cent407 within sub-catchment 407, situated just upstream of Dawson Highway.

The results indicate that the peak runoff increased by between 11.6% and 12.9%, with an average increase of 12.1% (refer to Section 4.4.1). This closely aligns with the climate change rainfall factors presented in Table 2.

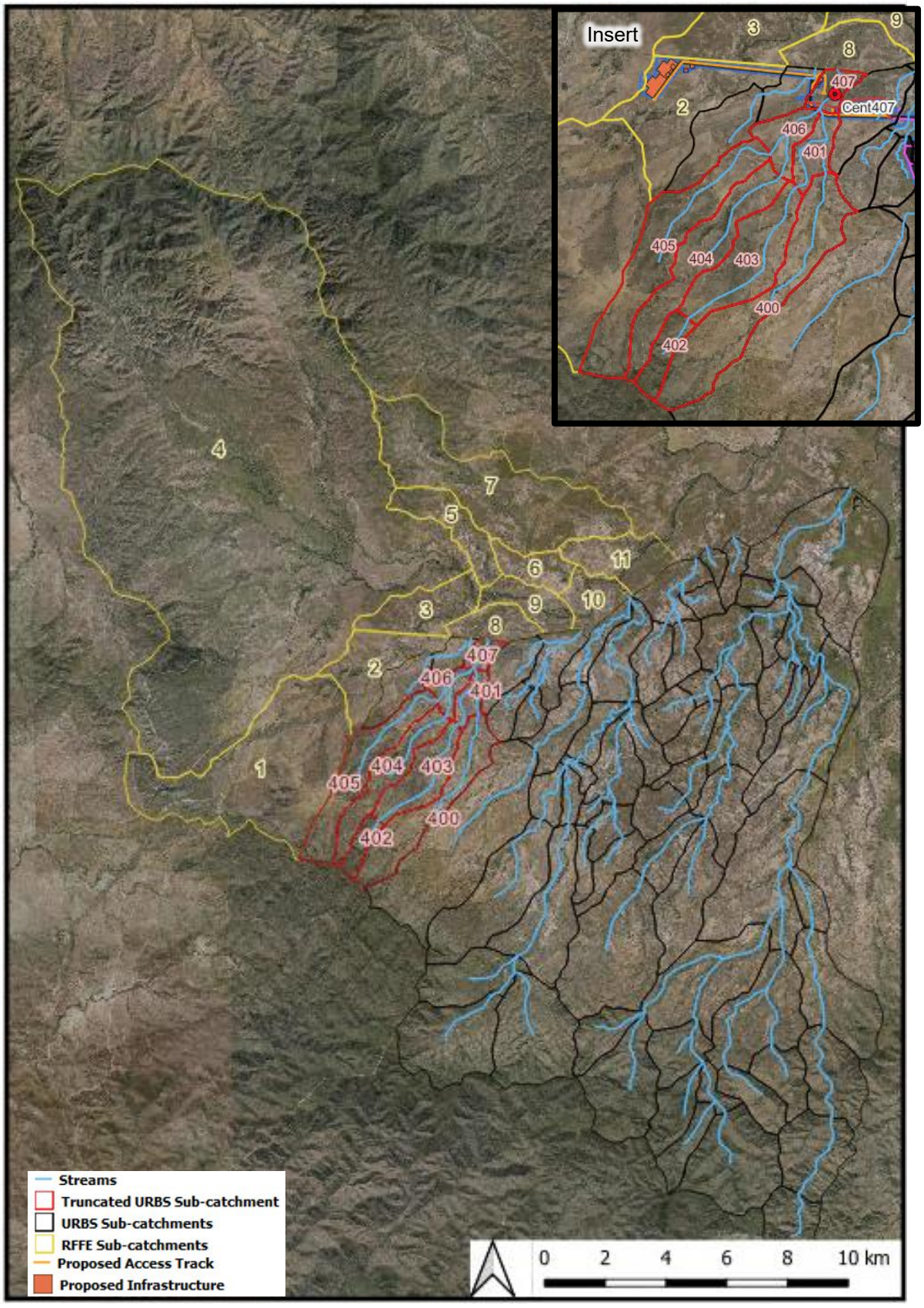


Figure 12 Catchment delineation used in hydrology

The inflows from RFFE for the original model were based on 4 sub-catchments:

- Sub-catchment A (INF_River): sub-catchment ids 1, 2, 3 and 4
- Sub-catchment B (INF_Trib04): sub-catchment ID 5
- Sub-catchment C (INF_Trib01): sub-catchment ID 6
- Sub-catchment D (INF_Trib03): sub-catchment ID 7.

These sub-catchments were further refined for this assessment (see Figure 12). Subsequently, some of the RFFE-estimated inflows were replaced with URBS-generated runoff (see Table 3), applying multiplication factors based on representative sub-catchment area. When selecting the representative sub-catchments the following factors were considered:

- Proximity of representative sub-catchment
- Terrain characteristics within and in the immediate vicinity of the representative sub-catchments
- Shape and size of the representative sub-catchment.

Table 3 Inflow source update

Sub-catchment	Original Inflow Source Name	Updated Inflow Source Name	Area (square kilometres)	Updated Inflow Source	Representative URBS Sub-catchment
1	INF_River	INF_U01	22.07	URBS	317
2		Wood_U02	5.64	URBS	206
3		Wood_U03	4.82	URBS	207
4		INF_River	165.93	RFFE	
5	INF_Trib04	Wood_R05	4.22	RFFE	
6	INF_Trib01	Wood_R06	2.67	RFFE	
7	INF_Trib03	INF_Trib03	17.98	RFFE	
8		Wood_U08	2.70	URBS	205
9		Wood_U09	3.14	URBS	205
10		Wood_U10	2.98	URBS	321
11		Wood_U11	4.61	URBS	321

4.3 Hydraulic modelling

The existing two-dimensional TUFLOW[1] hydraulic model was utilised in this assessment. A summary of the hydraulic model and parameters are provided in Table 4.

Table 4 Hydraulic model parameters

Parameter	Details
Completion date	December 2025
Annual Exceedance Probabilities (AEPs) assessed	10%, 1% and 0.2% (1 in 500)
Hydraulic model Inflow	• Unified River Basin Simulator (URBS) • Regional Flood Frequency Estimation (RFFE)
Hydraulic modelling	2023-03-AF-iSP-w64 Sub-Grid Sampling (SGS), Heavily Parallelised Compute (HPC) solution scheme with Graphics Processing Unit (GPU) hardware module.
Model grid size	10 m with 1 m Sub-Grid Sampling (SGS) grid size
Digital Elevation Model (DEM)	LiDAR (Feb 2024) which was provided with the original model
Roughness	Manning's roughness values were adopted from the received model and extended based on the updated model.
Model boundary	Upstream boundaries condition updated, refer to Section 4.2. Downstream model boundaries remain unchanged to the original model.
Timestep	Initial timestep 2 s followed by HPC adaptive timestep.
Hydraulic structures	Remain unchanged from the previous model extent (WRM, 2025). The details of the additional assumed cross drainage structures across the existing rail embankment are provided in Figure 16 and Table 6.

4.3.1 Hydraulic model setup

Figure 13 and Table 5 present the material roughness values used to define the Manning's roughness parameters in the TUFLOW model.

Table 5 Material roughness

Material ID	Mannin's Roughness	Description
10	0.055	Light vegetation/grass (Default layer)
20	0.020	Water body / dam / Roads / Rail
40	0.035	Active channel with light vegetation
60	0.080	Dense vegetation

Figure 14 shows updated inflow model boundaries the details of these inflow boundaries are summarised in Table 3. Figure 15 illustrates the model's flow boundaries along with the TUFLOW-generated topography used for the hydraulic modelling. Inflows were applied at the upstream extent of the model, while additional runoff from internal sub-catchments was incorporated through designated internal inflow boundaries.

[1] https://docs.tuflow.com/classic-hpc/manual/2025.0/

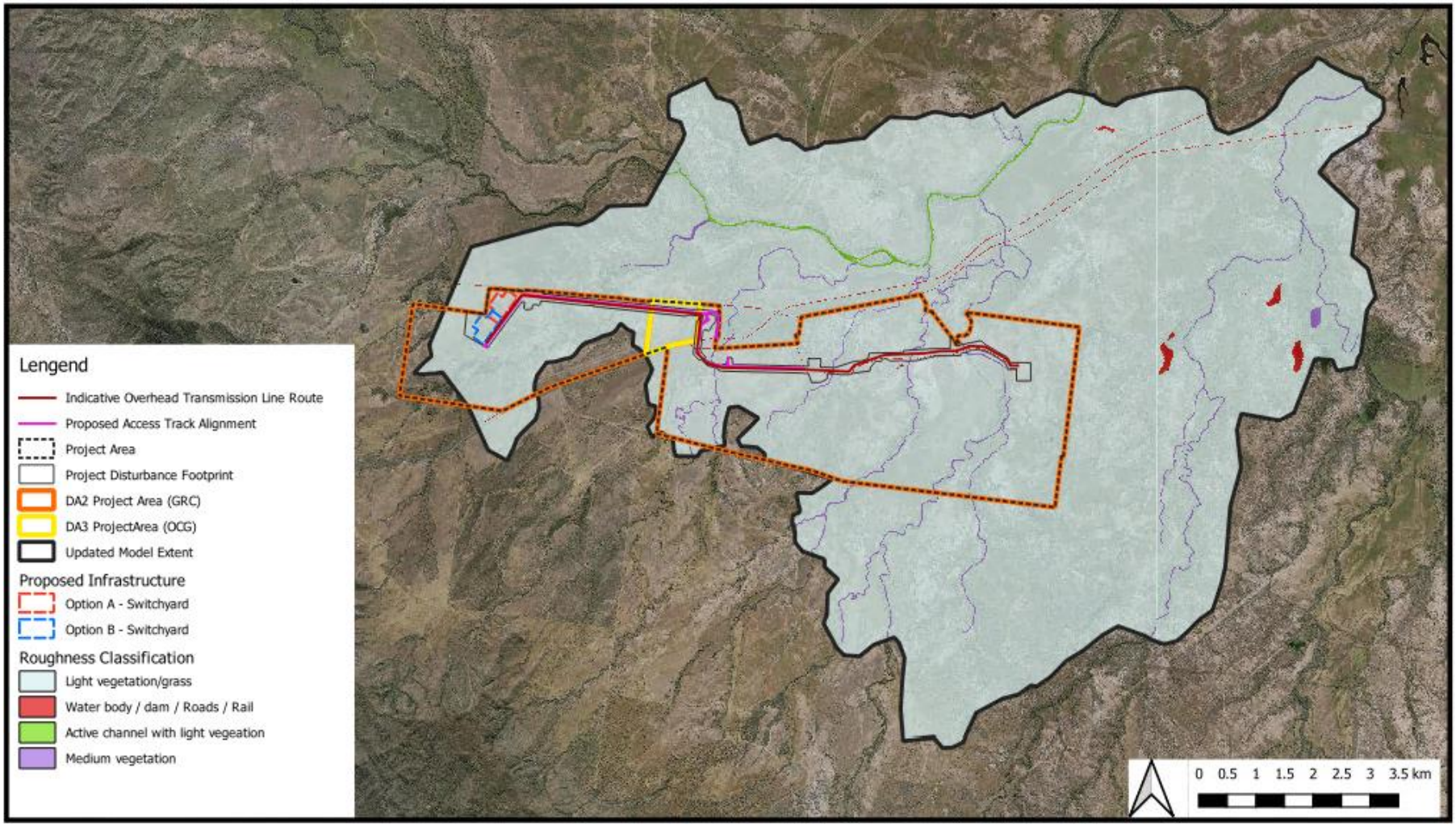


Figure 13 Material roughness

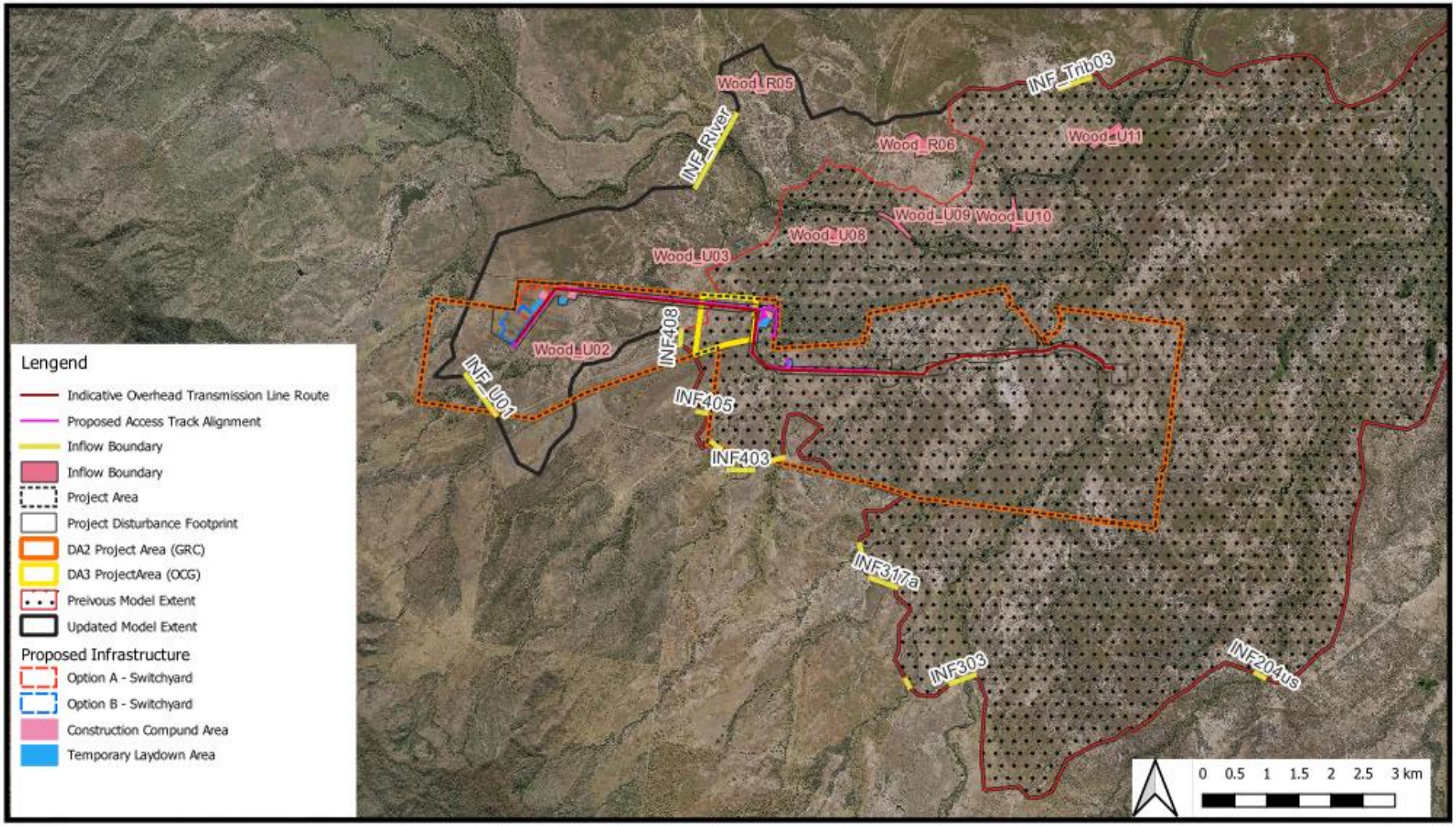


Figure 14 Updated model boundary

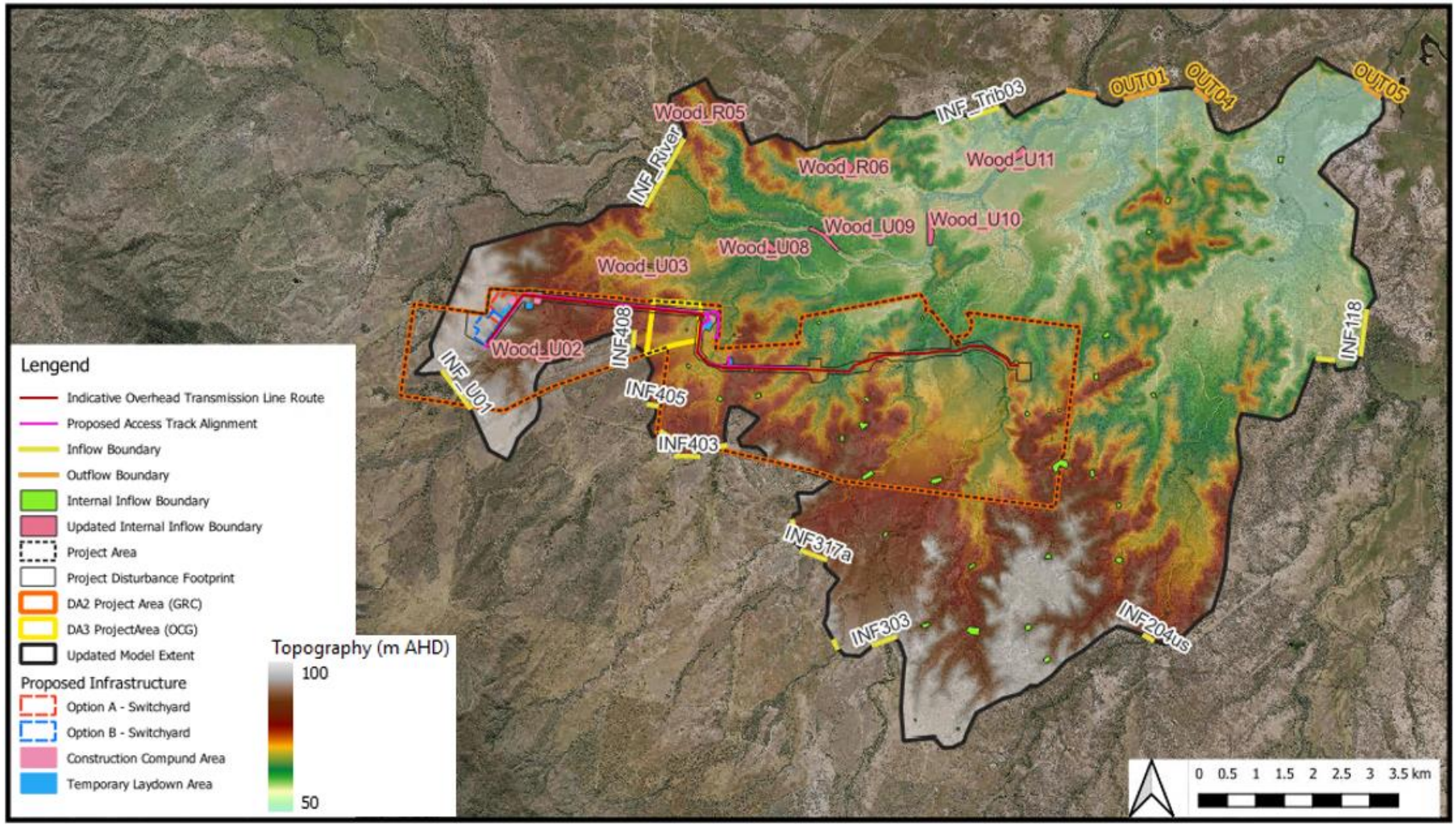


Figure 15 Model boundary condition and topography

Figure 16 shows the location of the drainage structures, and Table 6 provides further details of those drainage structures. The details of the drainage structures from the previous model extent developed by WRM (WRM, 2025) remain unchanged. A total of 4 drainage structures are included beneath the existing Moura railway. Due to limited information on the existing drainage structures, their sizes have been assumed based on aerial imagery and 1-meter LiDAR. The supplied LiDAR dataset indicated that the existing watercourse was obstructed at the railway bridge location as the point cloud did not capture the hydraulic opening beneath the structure. To accurately represent current drainage conditions, a bridge opening was manually incorporated into the model at this location.

This assessment considers existing condition flood behaviour only. Therefore, no culverts or embankments associated with the proposed access tracks are evaluated. A description of likely impacts from localised culvert crossing across the access tracks is provided in Section 4.4.2.1.

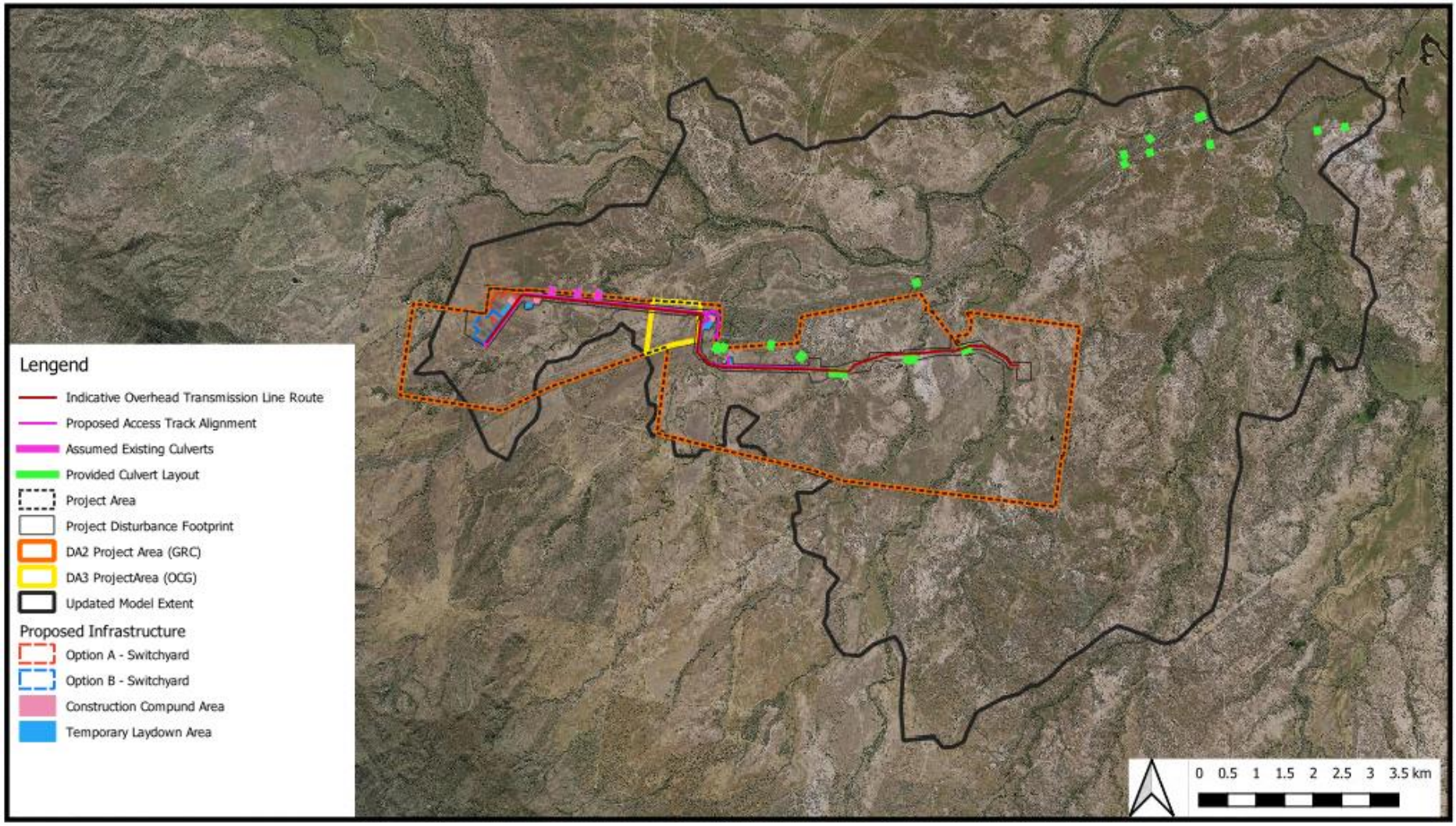


Figure 16 Cross drainage structures

Table 6 Cross drainage structures for the extended model

Existing Cross Drainage Structure	Dimensions	Comment
Wood_01	1/1200 mm RCP	Assumed details were based on LiDAR and aerial photography.
Wood_02	1/1200 mm RCP	
Wood_03	1/1200 mm RCP	
Bridge Opening	10 m	
Prim_1c	4 / 3000 x 3000 RCBC	Cross drainage structures provided as part of the base model.
Sec_3c	4 / 2100 x 1500 RCBC	
Prim_1a	8 / 2100 x 2100 RCBC	
Prim_2	8 / 1200 x 600 RCBC	
Prim_3a	4 / 1200 x 600 RCBC	
Sec_1c	8 / 1200 x 1200 RCBC	
Sec_3a	8 / 2100 x 2100 RCBC	
Sec_6a	4 / 3600 x 3600 RCBC	
Sec_1a	8 / 1200 x 600 RCBC	
Sec_1b	14 / 1200 x 600 RCBC	
Prim_1b	4 / 2100 x 2100 RCBC	
Prim_3b	4 / 1200 x 600 RCBC	
Sec_3b	8 / 2100 x 1500 RCBC	
Sec_6b	4 / 2100 x 1200 RCBC	
Sec_6c	4 / 2100 x 1200 RCBC	
Prim_1d	4 / 2100 x 1200 RCBC	
Loc1	4 / 2800 x 2400 RCBC	
Loc1b	4 / 2800 x 2400 RCBC	
Loc1c	12 / 2800 x 2400 RCBC	
Loc1d	4 / 2800 x 2400 RCBC	
Loc2	4 / 2800 x 2400 RCBC	
Loc3	4 / 2800 x 2400 RCBC	
Loc4	4 / 2800 x 2400 RCBC	
Loc5	4 / 2800 x 2400 RCBC	
Loc6a	4 / 2800 x 2400 RCBC	
Loc6b	4 / 2800 x 2400 RCBC	

4.4 Results

4.4.1 Hydrology

Figure 17 shows the influence of the rainfall multiplication factor on total runoff at location Cent407, situated just upstream of Dawson Highway (Figure 12, insert). The results indicate that peak runoff increased due to climate-change-induced rainfall intensification by between 11.6% and 12.9%, with an average increase of 12.1% (Figure 18). This closely aligns with the climate change rainfall factors presented in Table 2. For further details, refer to Section 4.2.

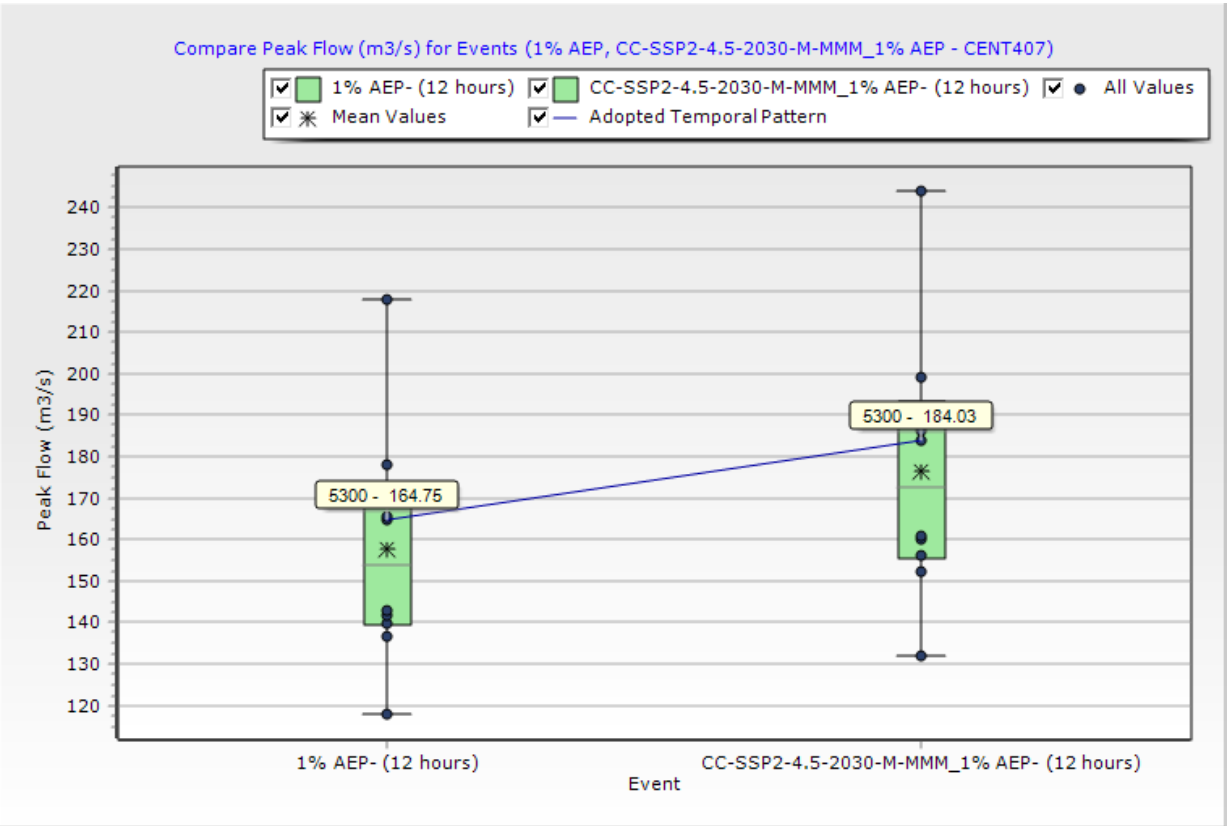


Figure 17 Increase in Peak Flow Rates due to Climate Change factor

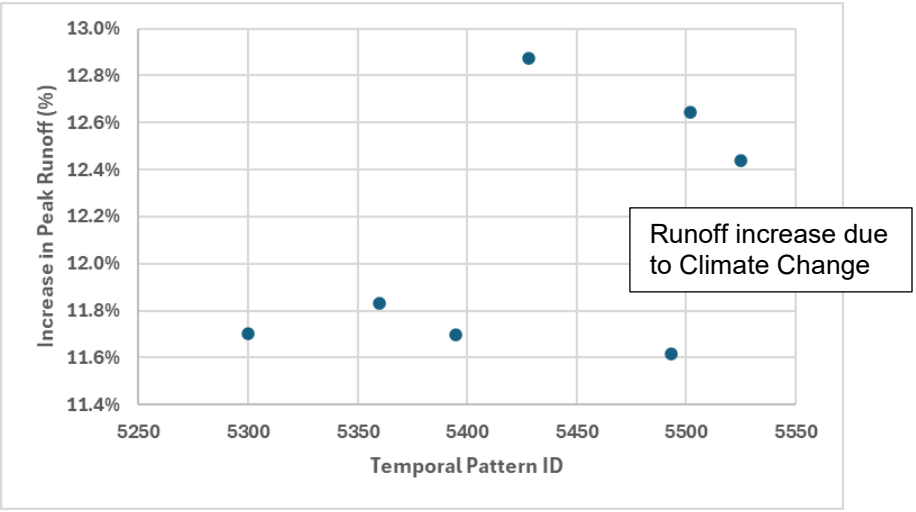


Figure 18 Increase in Peak Runoff for each 1% AEP 12 hr temporal pattern

4.4.2 Hydraulics

The existing case peak flood depths, along with flood level contour level maps, are provided in Appendix A. Figure 19 represents the critical duration analysis details for the 1% AEP. Consistently with the previous study for DA1 submission, the 12 hr duration was identified as the critical duration for the 1% AEP event. The critical durations for the 0.2% AEP (1 in 500) and 10% AEP storm events are 12 hr and 24 hr, respectively.

A total of 20 mapped waterway crossings under the Fisheries Act 1994 were identified between monopole 1 (NP1) and the switchyard (see Figure 20).

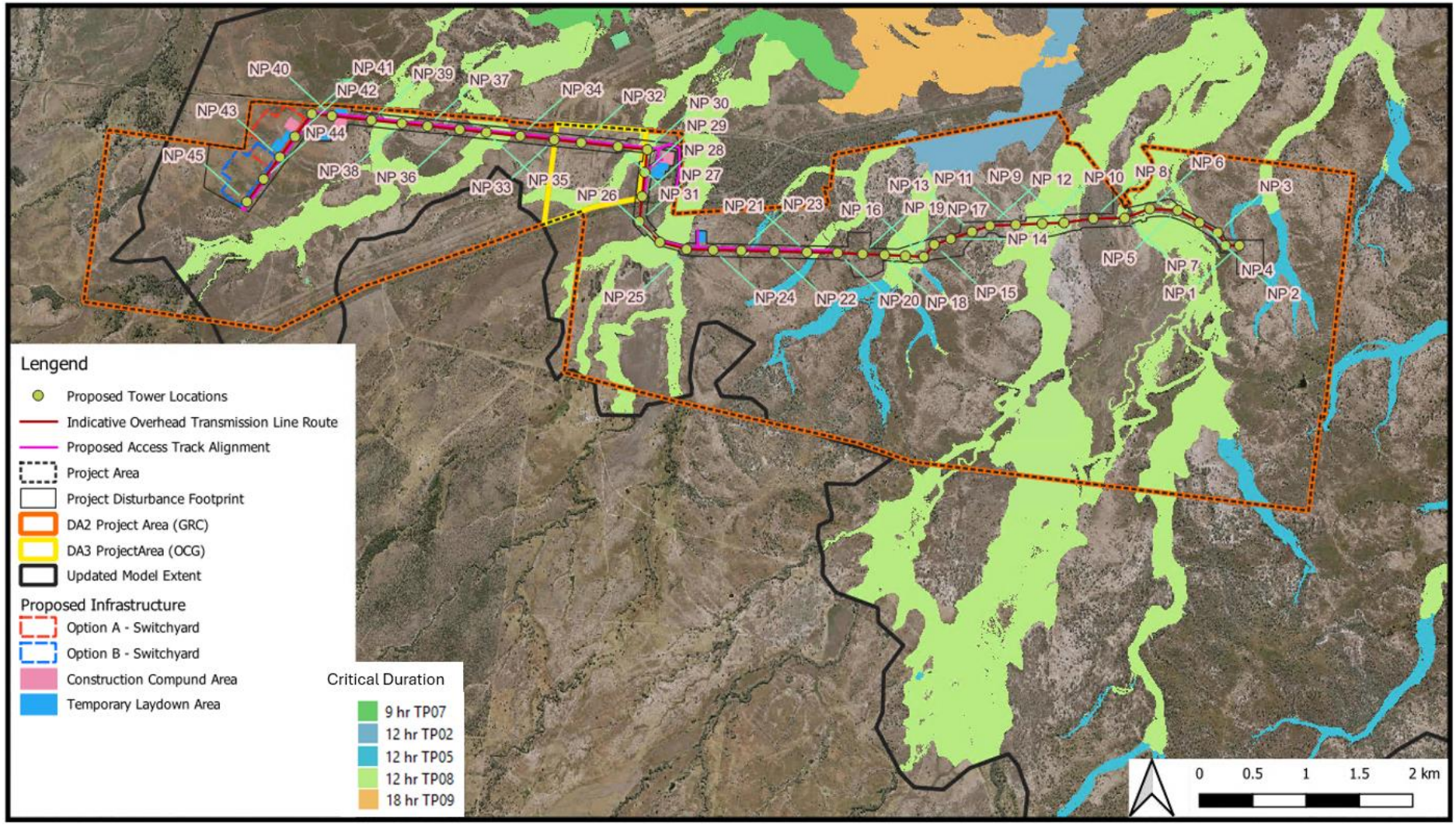


Figure 19 Estimated Existing Critical Duration Analysis for 1% AEP Storm Events

4.4.2.1 Monopole and access track

Figure 20 illustrates the waterway classification in accordance with the Department of Primary Industries (DPI) guidelines. Depending on the type of cross-drainage structure (i.e. culvert) proposed at each waterway location, the design will be required to comply with the Accepted Development Requirements for Operational Works that is Constructing or Raising Waterway Barrier Works. If compliance cannot be achieved, a Development Permit may be required.

Accordingly, waterway crossing numbers from 01 to 20 (Figure 20) and monopole numbers from 1 (NP1) to 45 (NP45) have been assessed as part of this assessment.

In accordance with the Waterway Barrier Works Self-Assessment guideline, none of the proposed waterway crossings require development approval, provided they are designed as bed-level structures. Should culvert-type crossings be adopted, only those situated on Purple-coded waterways (Table 7) will require a Development Approval (DA) under the relevant regulatory framework[2].

Table 7 Waterway crossings

Waterway Crossing ID	Colour	Classification	1% AEP flood level m AHD	1% AEP Flow Width (exceeding the 0.3 m depth threshold) m
01	Purple	Major	64.01	107
03	Purple	Major	66.23	300
05	Amber	Moderate	64	115
06	Amber	Moderate	64	116
09	Red	High	71.54	180
10	Red	High	71.52	103
11	Amber	Moderate	68.63	128
13	Purple	Major	76.28	170
20	Purple	Major	71.28	230

Table 8 presents the peak flood levels at proposed monopole locations. Table 9 presents the peak flood levels at waterways crossings. The proposed switchyard is situated across 3 waterways (waterway crossing ID 17, 18 and 19, Figure 20) classified as Green (low risk).

[2] Accepted development requirements for operational work that is constructing or raising waterway barrier works: September 2025

Table 8 Peak flood levels (m AHD) at monopoles

NP Location ID	10% AEP	1% AEP	0.2% AEP (1 in 500)
NP 4			65.45
NP 5		63.94	64.48
NP 6		63.88	63.99
NP 9			66.92
NP 10	65.48	66.15	66.43
NP 17	63.64	63.86	63.92
NP 26	70.52	71.52	71.78
NP 30	68.09	68.35	68.46
NP 35		76.43	76.85
NP 38		79.24	79.38
NP 39			79.64

Table 9 Peak flood levels (m AHD) at waterways

Waterway Crossing ID	10% AEP	1% AEP	0.2% AEP (1 in 500)
01	63.49	64.01	64.09
02		65.74	65.85
03	65.58	66.23	66.5
05	63.86	64	64.05
06	63.84	64	64.05
07	67.1	67.38	67.48
08	72.35	72.49	72.54
09	70.69	71.54	71.78
10	70.55	71.52	71.77
11	68.39	68.63	68.73
13	74.97	76.28	76.79
14	74.63	76.2	76.72
15		79.24	79.38
16			78.95
20	70.15	71.28	71.51

Figure 21 illustrates the estimated flood depths for the 1% AEP storm event.

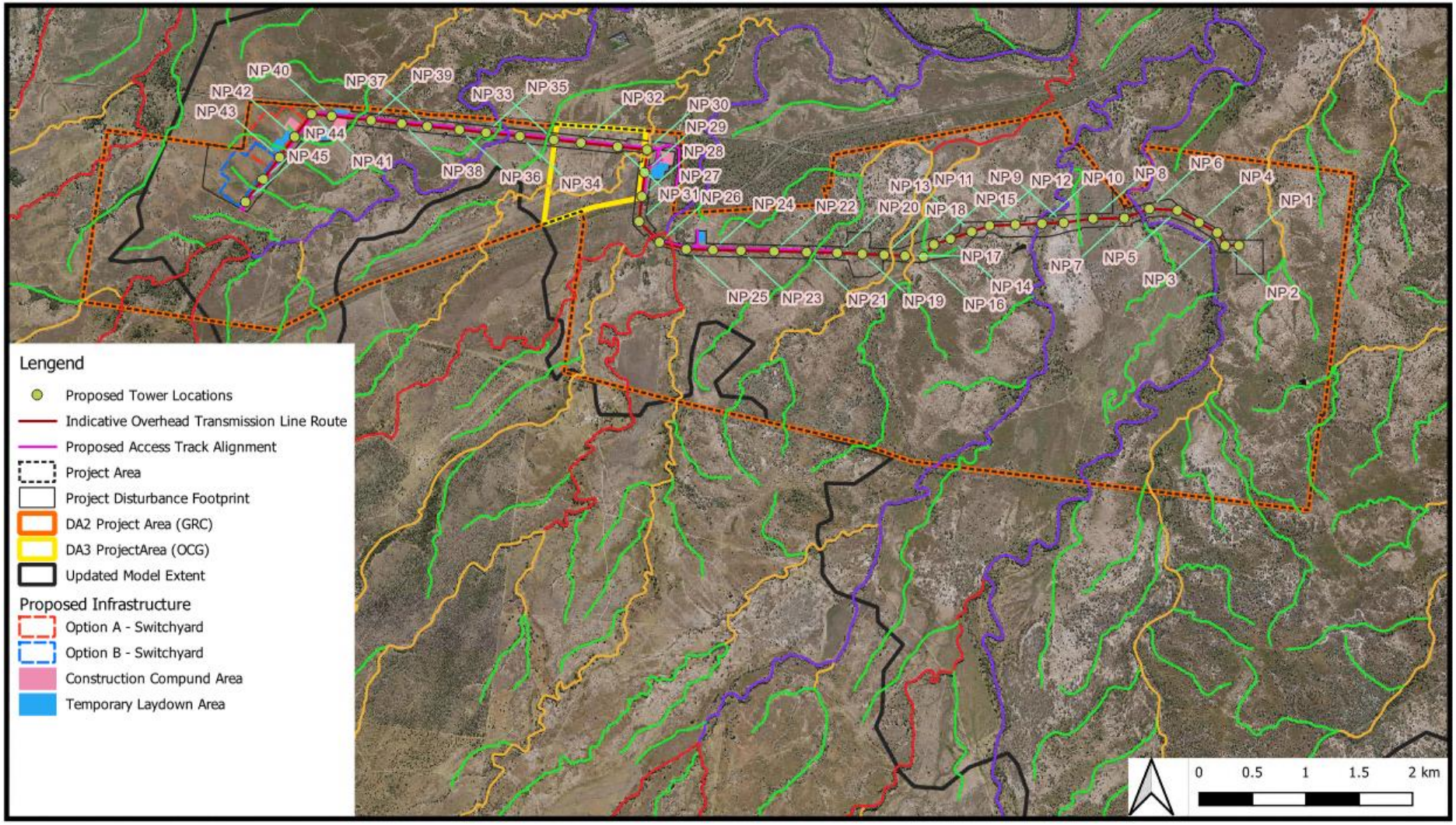


Figure 20 Waterway classification

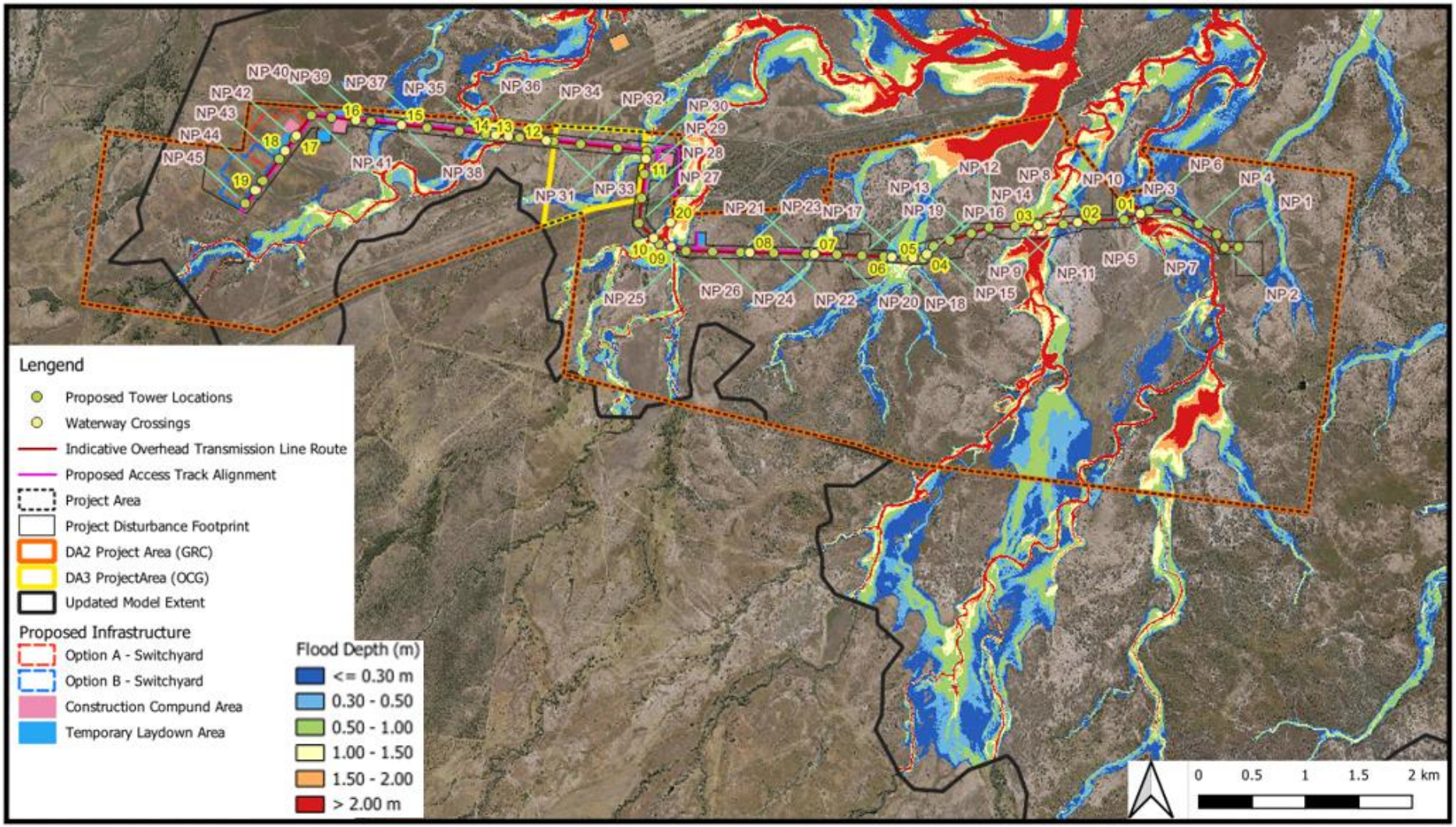


Figure 21 Estimated existing peak flood depth for 1% AEP storm events

A summary of the existing flood conditions and potential impacts from crossings along the transmission line access track is summarised below:

- Waterway crossings IDs 12 and 16 to19 are along very minor overland flowpaths, and outside the modelled flood extents. It is assumed that these crossing will not require dedicated culvert, as sheetflow conditions can be maintained.
- Waterway crossings #7 and #8 exhibit flood depths of approximately 1.0 m and 0.5 m, respectively, during the 1% AEP event. If the proposed design includes embankments and culvert crossings at these locations, localised flood impacts may be observed, particularly at crossing #7. Mitigation strategies such as installing additional culvert cells, reducing the invert levels of culvert cells, and lowering the elevation of the crossing can be implemented to manage these localised impacts.
- Waterway crossings #13 and #14 are located along Running Creek. The 1% AEP flood extent shows hydraulic connectivity between the tributary and the Running Creek floodplain. Flood depths at crossing #13 are approximately 3.9 m (10% AEP) and 5.2 m (1% AEP). Access tracks at moderate and high-risk waterway crossings will include dedicated culvert or floodway crossings, to improve trafficability. Potential flood impacts arising from this can be mitigated to an acceptable level through design. For example, by including sufficient culvert cells to reduce the concentration of flowpaths, lowering the invert level of the culvert cells, or decreasing the elevation of the crossings. These mitigations will be confirmed during the detailed design phase.
- Waterway crossing #15 only experiences flooding in the 1% AEP and rarer events. Therefore, if the access-track flood-immunity requirement is ≤ 10% AEP, a culvert crossing is not required.
- Waterway crossings #09 and #11 intersect High and Moderate waterway areas, with existing-condition flood depths of approximately 4.0 m and 1.5 m, respectively, in the 1% AEP event. Potential flood impacts arising from this crossing can be mitigated by design measures, such as including sufficient culvert cells to reduce concentration of flowpaths, reducing the invert level of the culvert cells, or lower the elevation of the crossing.
- The monopoles located on either side of Waterway Crossing #10 are NP26 and NP27. No access track is proposed at waterway crossing #10 at the OHTL crossing point to reach these structures. These monopoles can be accessed from opposite directions as outlined in the proposed access track layout (Figure 22).
- Waterway crossing #20 is excluded from this assessment as it is associated with the site access track and has been assessed in DA1.
- The Project Disturbance Footprint along the proposed OHTL alignment, excluding designated access track locations, is expected to have negligible flooding impact. This expectation is based on the fact that all temporary works will be undertaken with minimal environmental disturbance and will be reinstated to existing conditions. Additional controls will be implemented where works intersect existing flow paths (i.e. Waterway crossings #01, #03, #10).

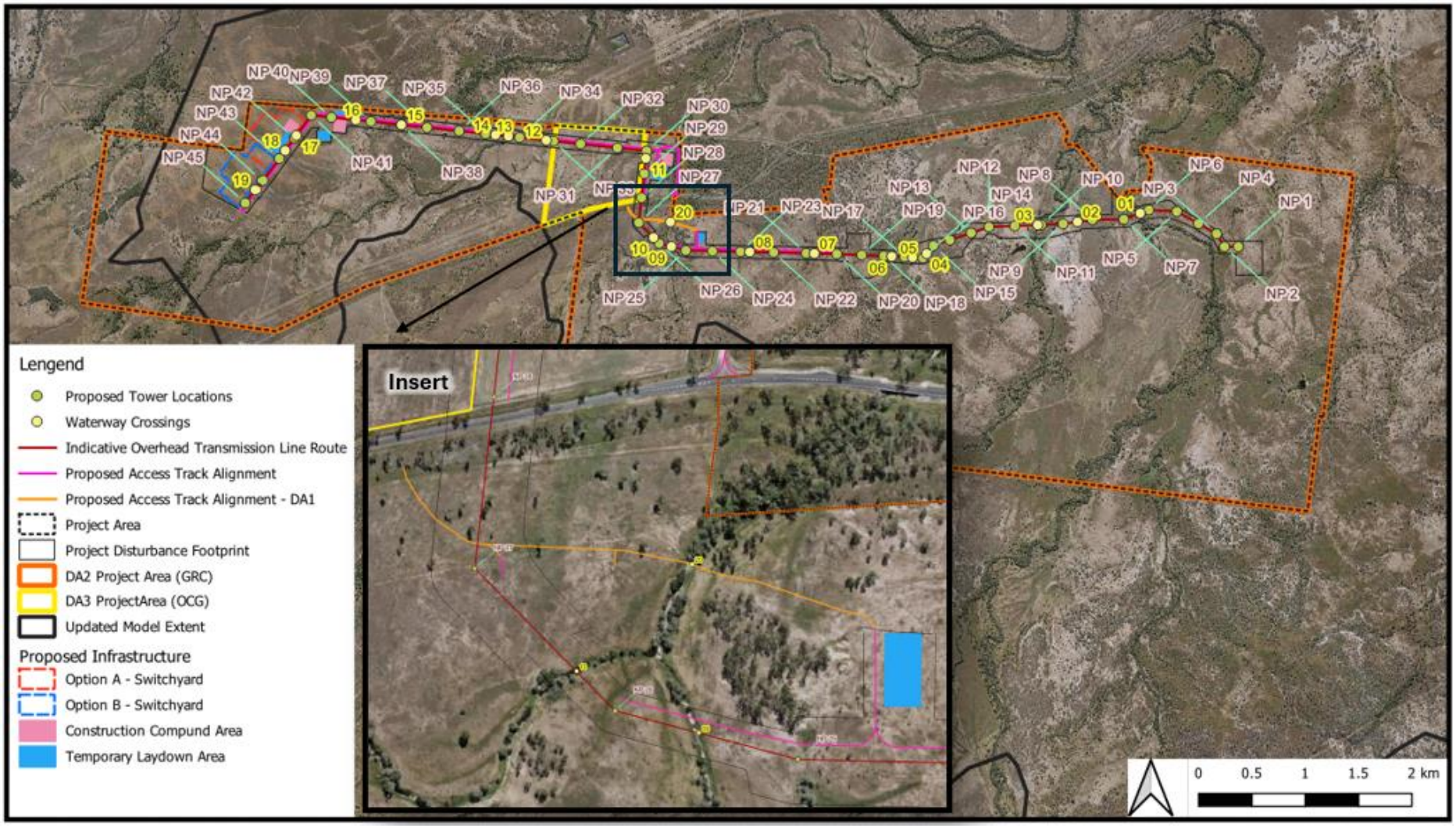


Figure 22 Monopoles NP26 and NP27 access tracks

Figure 23 illustrates the estimated flood extents for 10% AEP, 1% AEP and 0.2% AEP (1 in 500 AEP) storm events.

Figure 24 shows the peak flow velocities for the 1% AEP storm event, while Table 10 and Table 11 provide a detailed summary of these values at key locations within the Project Disturbance Footprint. The existing case peak flow velocity maps are provided in Appendix A.

Flood results indicate that the maximum flow velocities occur in the creek area (Location 13) between NP34 and NP36 with value of 1.91 metres per second (m/s), 2.04 m/s and 2.08 m/s for the 10%, 1% and 0.2% AEP storm events, respectively. The final locations for OHTL monopoles NP5, NP6, NP10, NP17, NP26, NP30, NP35, and NP38 should be carefully reviewed to minimise potential hydraulic and environmental impacts during detailed design phase, noting the small footprint of the monopole foundations. Where possible, these monopoles should be constructed outside of the 1% AEP flood extent. If this cannot be achieved, the monopoles must be engineered to withstand inundation, including debris loading and potential erosion effects.

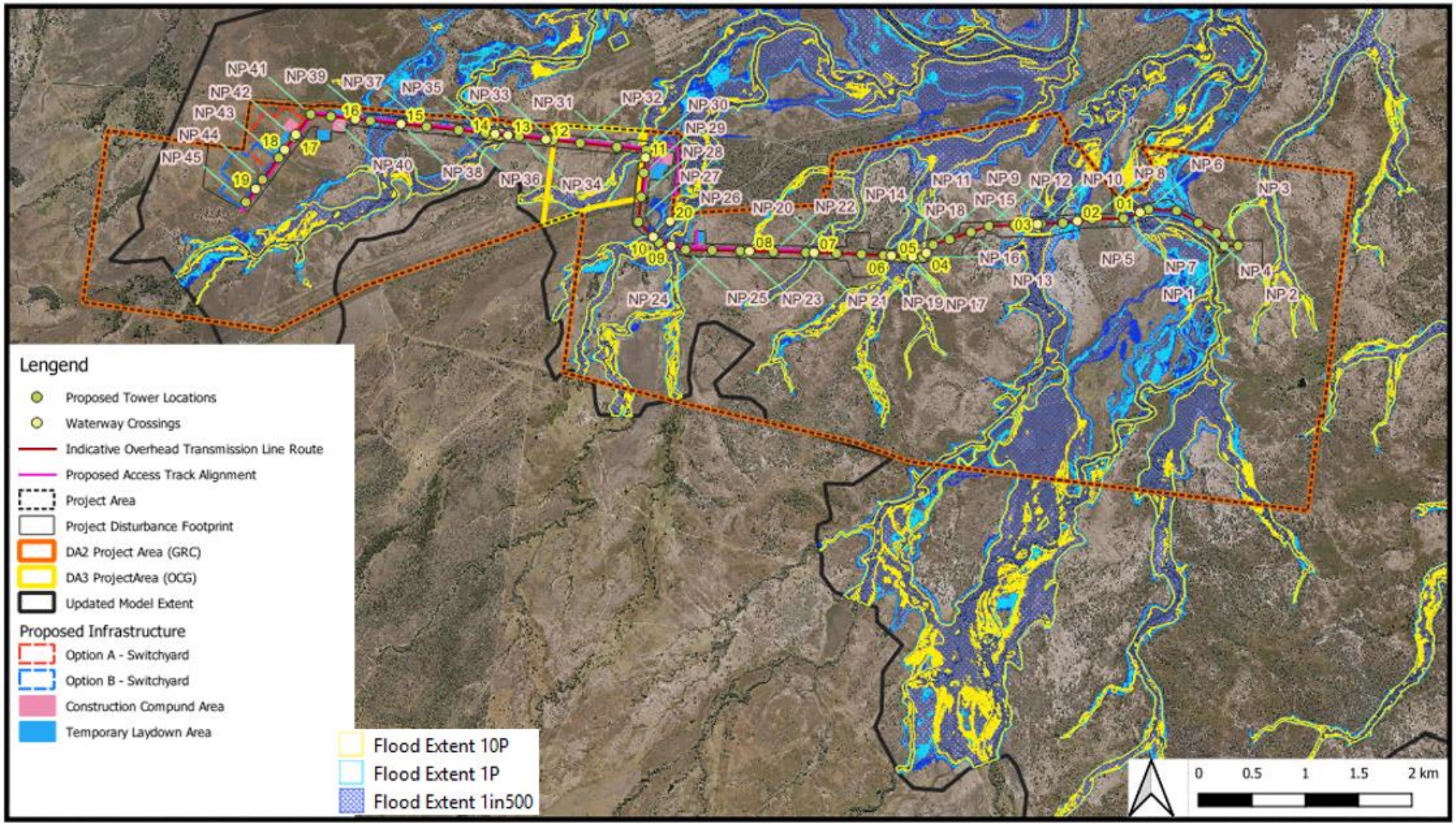


Figure 23 Estimated existing flood extents

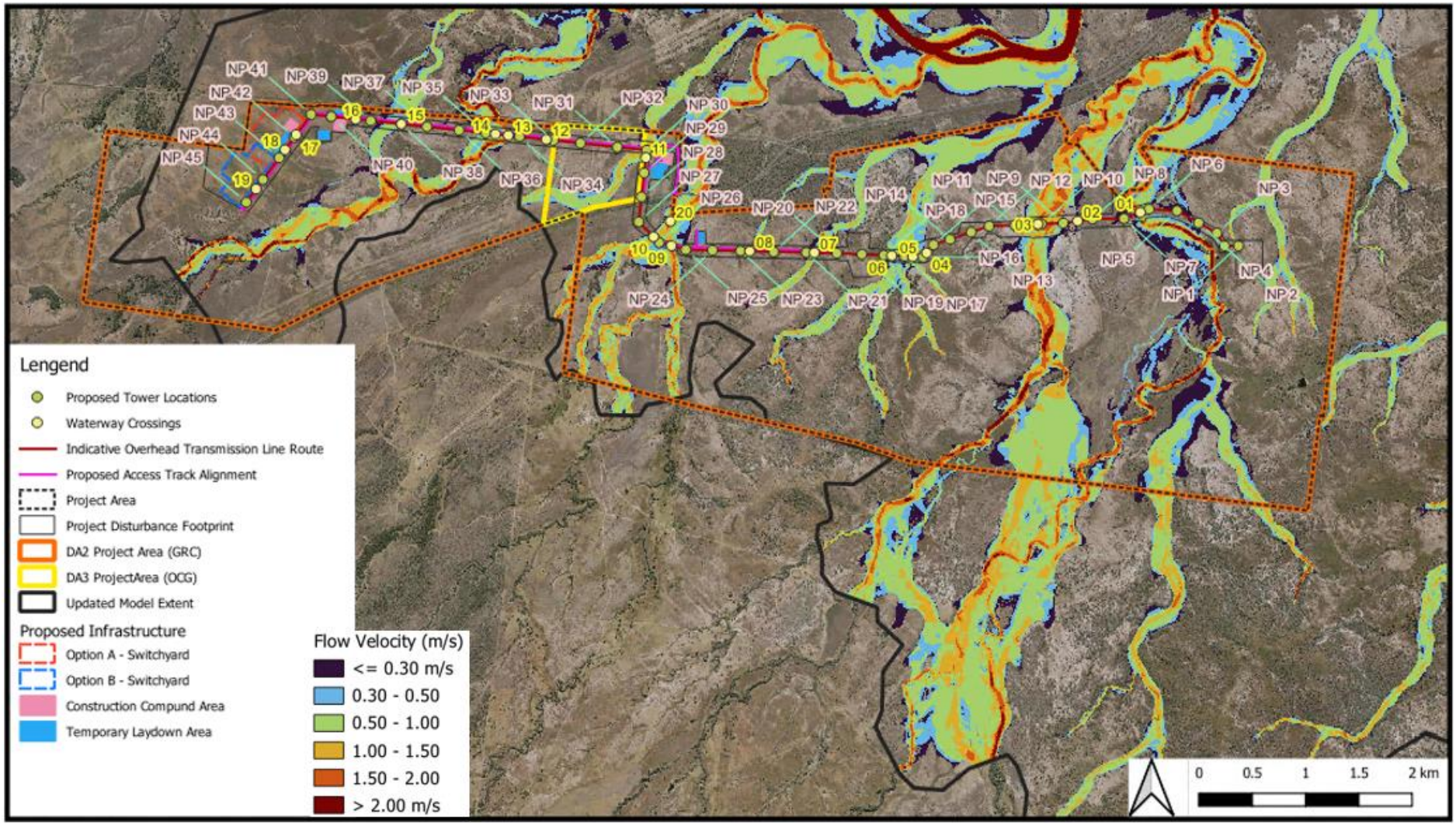


Figure 24 Estimated existing peak flow velocity for 1% AEP storm events

Table 10 Peak flow velocity (m/s) at monopoles

NP Location ID	10% AEP	1% AEP	0.2% AEP (1 in 500)
NP 4		0.25	0.55
NP 5		0.11	0.54
NP 6		0.36	0.55
NP 9			0.34
NP 10	0.56	1.15	1.39
NP 17	0.36	0.59	0.65
NP 26	0.16	0.62	0.75
NP 30	0.66	0.93	1.01
NP 35		0.11	0.43
NP 38		0.52	0.57
NP 39			0.34

Table 11 Peak flow velocity (m/s) at waterways

Waterway Crossing ID	10% AEP	1% AEP	0.2% AEP (1 in 500)
01	1.14	1.4	1.44
02		0.2	0.47
03	1.48	1.82	1.97
05	1.24	1.51	1.61
06	0.45	0.63	0.68
07	0.65	0.76	0.82
08	0.72	0.92	0.94
09	1.4	1.44	1.44
10	1.41	1.69	1.76
11	0.89	1.03	1.07
13	1.91	2.04	2.08
14	0.14	1.1	1.19
15		0.52	0.57
16			0.03
20	1.52	1.62	1.65

A summary of the flood hazard assessment associated with the Project is provided below. The adopted flood hazard classification is based on the Australian Disaster Resilience Guideline 7-3 Flood Hazard (AIDR, 2017). The flood hazard categories, as defined by AIDR, are summarised in Table 12 and illustrated in Figure 25.

Table 12 Combined hazard curves - Vulnerability threshold classification limits[3]

Hazard Vulnerability Classification	Classification limit (D x V), m^2/s	Limiting Still Water Depth (D), m	Limiting Velocity (V), m/s	Description
H1	D*V ≤ 0.3	0.3	2.0	Generally safe for vehicles, people and buildings.
H2	D*V ≤ 0.6	0.5	2.0	Unsafe for small vehicles.
H3	D*V ≤ 0.6	1.2	2.0	Unsafe for vehicles, children and the elderly.
H4	D*V ≤ 1.0	2.0	2.0	Unsafe for vehicles and people.
H5	D*V ≤ 4.0	4.0	4.0	Unsafe for vehicles and people. All building types vulnerable to structural damage. Some less robust building types vulnerable to failure.
H6	D*V > 4.0	-	-	Unsafe for vehicles and people. All building types considered vulnerable to failure.

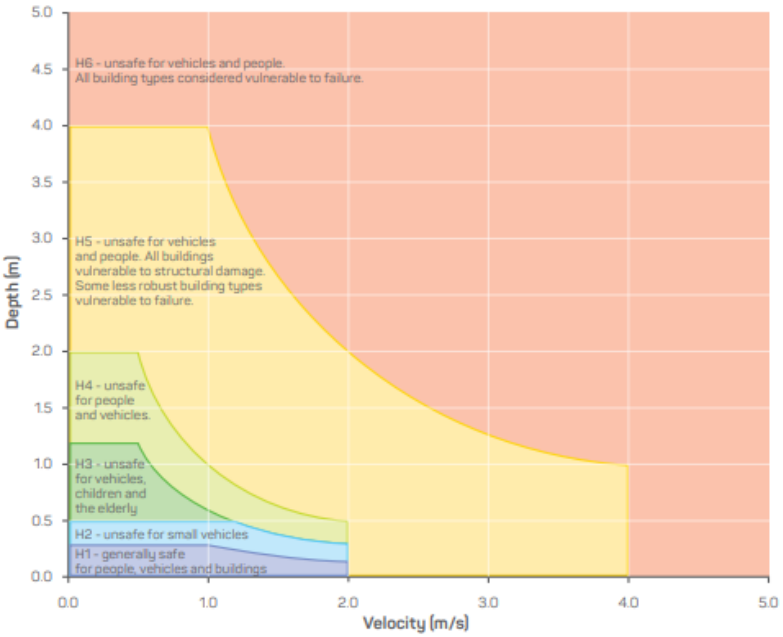


Figure 25 General flood hazard vulnerable curve[4]

Figure 26 shows the peak flood hazard category for the 1% AEP storm event, while Table 13 and Table 14 provide a detailed summary of these values at key locations along the Project Disturbance Footprint.

The flood hazard categories are summarised in Table 12 with Table 13 and Table 14 presenting the hazard classification for key locations of interest. Based on these findings, activities such as construction, maintenance, and vehicle operations near waterways prone to inundation are considered unsafe when the hazard category exceeds H2 for small vehicles and exceeds H3 for people and vehicles. Additionally, consideration should be given to any infrastructure (monopoles or temporary ancillary facilities) proposed within the hazardous flood extent, refer to Table 13.

As shown in Figure 25, all building types exhibit susceptibility to structural damage when subjected to hydraulic conditions associated with Flood Hazard Category H5. However, structural damage may

[3] https://knowledge.aidr.org.au/media/3518/adr-guideline-7-3.pdf
[4] https://knowledge.aidr.org.au/media/3518/adr-guideline-7-3.pdf

initiate at lower hazard categories depending on site-specific geotechnical and hydraulic factors, including soil erodibility, dispersity, and the local flow regime.

The existing case peak flood hazard category maps are provided in Appendix A. Prior to commencing any activities, all relevant personnel must familiarise themselves with the predicted inundation extents, associated hydraulic impacts, and potential safety hazards. Planned works should also incorporate consideration of forecast weather conditions to ensure safe and compliant execution.

Table 13 Peak flood hazard category at monopole

NP Location ID	10% AEP	1% AEP	0.2% AEP (1 in 500)
NP 4		H1	H1
NP 5		H1	H3
NP 6		H1	H1
NP 9			H1
NP 10	H1	H4	H5
NP 17	H1	H2	H2
NP 26	H4	H5	H5
NP 30	H1	H2	H3
NP 35		H2	H3
NP 38		H3	H3
NP 39			H1

Table 14 Peak flood hazard category at waterways

Waterway Crossing ID	10% AEP	1% AEP	0.2% AEP (1 in 500)
01	H6	H6	H6
02		H1	H1
03	H5	H6	H6
05	H4	H5	H5
06	H1	H2	H2
07	H3	H3	H4
08	H1	H2	H2
09	H5	H5	H5
10	H5	H6	H6
11	H3	H4	H5
13	H6	H6	H6
14	H2	H5	H5
15		H3	H3
16			H1
20	6	6	6

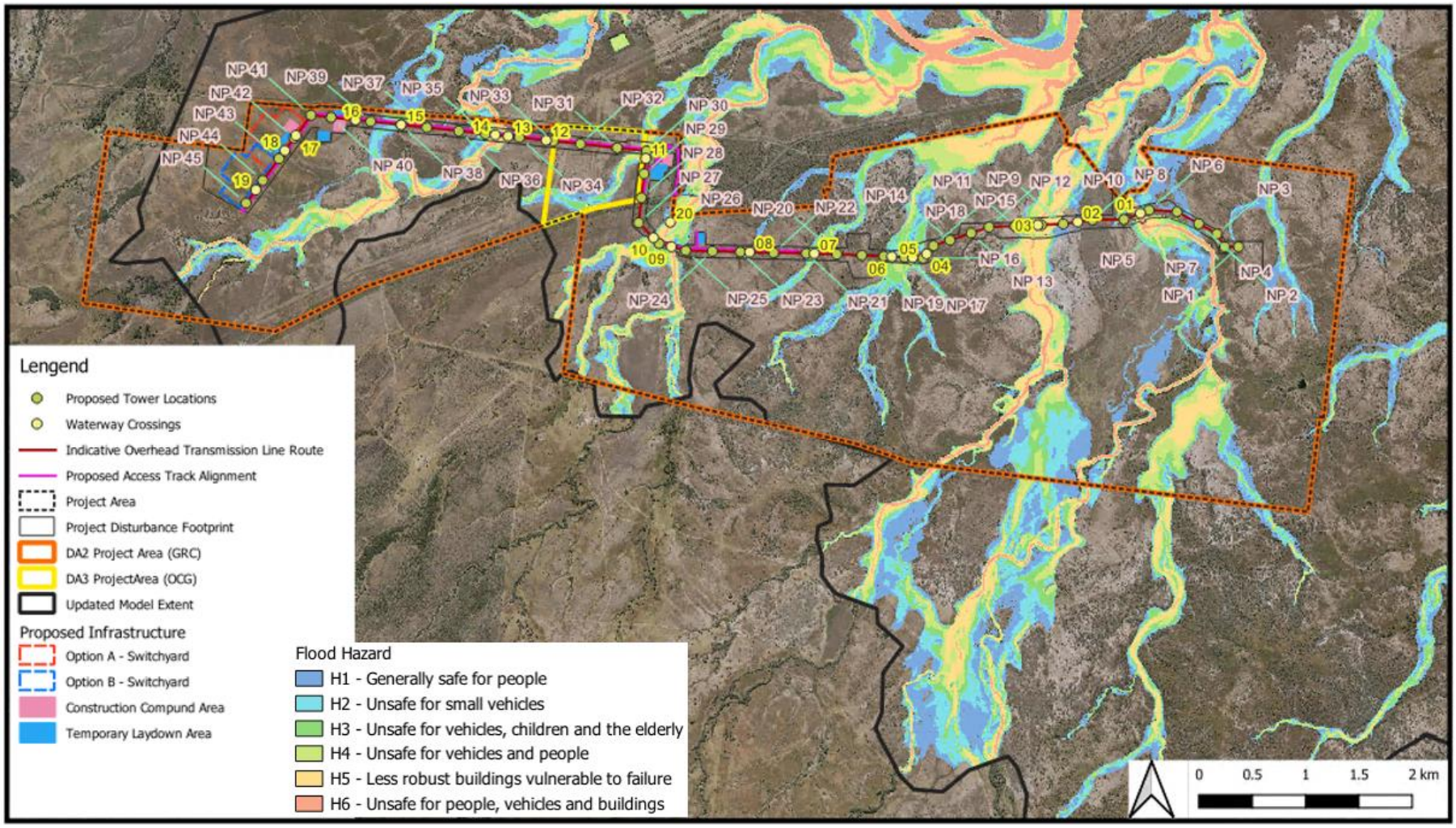


Figure 26 Estimated existing peak flood hazard category for 1% AEP storm events

4.4.2.2 Switchyard and laydown areas

Figure 27 presents the estimated existing peak flood extent for the 10% AEP, 1% AEP and 0.2% AEP (1 in 500 AEP) storm events, including the switchyard and the proposed construction compound, which involves a storage area, offices, a meeting room, ablution facilities, a canteen, and parking and laydown areas. As mentioned in Section 1.3.5, the temporary construction compound and laydown areas can be located anywhere within the Project Disturbance Footprint. The proposed switchyard platform is situated more than 1000 millimetres (mm) above the 1 in 500 AEP flood level. The figure also identifies 3 laydown areas:

- LA1 – The proposed laydown area is located more than 1000 mm above the 1% AEP flood level.
- LA2 – The existing ground level within the proposed laydown area ranges from approximately 69.3 m AHD to 70.3 m AHD. The proposed 1% AEP flood level at this location ranges from approximately from 68.9 m AHD to 69.3 m AHD. Accordingly, LA2 is above 1% AEP flood level.
- LA3 – The proposed laydown area is located more 1000 mm above the 1% AEP flood level.

Accordingly, the impacts of existing flooding on these structures and areas are expected to be minimal due to the available freeboard. Potential flood impacts associated with the switchyard and laydown areas are also expected to be minimal, as the disturbance footprints are located outside the 1% AEP flood extent. As a result, minimal impacts to flow velocities and flood hazard are anticipated.

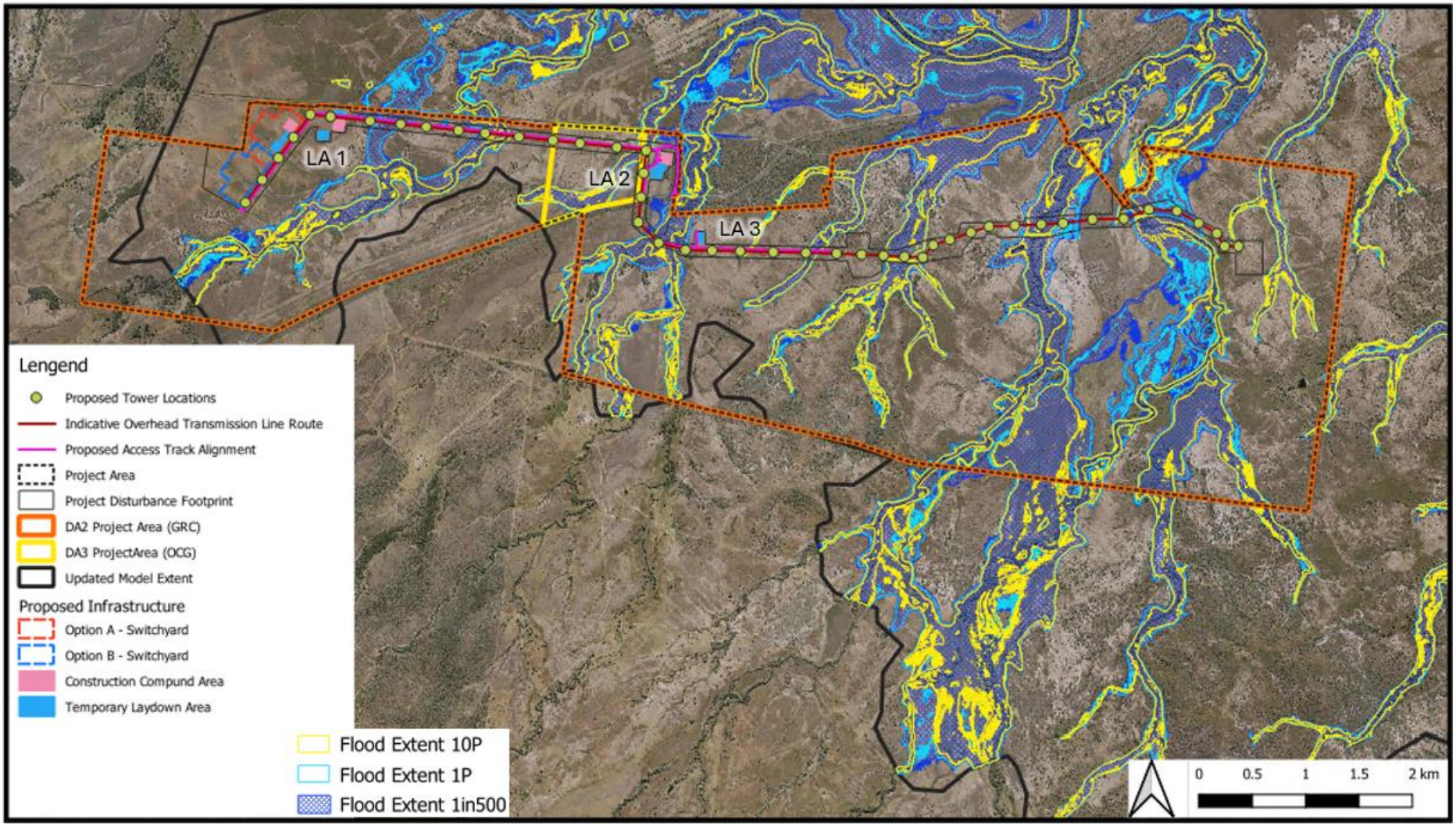


Figure 27 Estimated existing peak flood extent for 1% AEP and 1 in 500 storm events

5.0 Development outcomes for assessable development

5.1 Gladstone Regional Council Planning Scheme 2015

The proposed development constitutes an Assessable Development and is subject to Impact Assessment Pursuant to the Planning Scheme and Development Scheme. Compliance is achieved where the development satisfies the intent of the Strategic Framework and provisions of the relevant zone and overlay codes, including the purpose, overall outcomes, performance outcomes, or acceptable outcomes prescribed therein.

As mentioned in Section 1.2.1, Project will be located across two jurisdictions:

- Planning Scheme jurisdiction
- Development Scheme jurisdiction.

Approximately 840 m of OHTL and 2 monopoles will be located in the Development Scheme Jurisdiction. The rest of the proposed infrastructure will be located in the Planning Scheme Jurisdiction.

As outlined in Section 2.3, the Project Disturbance Footprint for this assessment comprises:

- Monopoles and ancillary infrastructure associated with OHTL between monopole 1 (NP1) and monopole (NP45)
- Switchyard location: The proposed switchyard is located outside the mapped flood extent
- A total of 3 laydown areas: LA1, LA2 and LA3 (Figure 3 and Section 4.4.2.2).
- The access tracks proposed as part of the Project, noting that other access tracks to the south of the Dawson Highway have been addressed as part of DA1.

Accordingly, waterway crossing numbers from 07 to 19 (Figure 20) and monopole numbers from 1 (NP1) to 45 (NP45) have been assessed as part of this assessment. Waterway crossing number 20 is excluded from this assessment as it is associated with the site access track and has been assessed in DA1.

Most of the Project Disturbance Footprint will be located outside the design flood extent, thereby minimising interactions with floodwaters and associated impacts. As outlined in this report, it is anticipated that the proposed works will result in minimal alteration to existing flow behaviour due to:

- Most of the monopole footprint consisting of small areas located outside of the flood zone
- The proposed switchyard being situated outside floodplain
- The proposed access track including dedicated waterway crossings (such as culverts or floodways) to ensure that natural drainage lines and hydrological regimes are maintained.

More details are summarised in following tables. Based on the information presented in the following tables the development is considered capable of complying with the objectives of SPP Appendix 2 – Stormwater Management[5]. Should future design changes be proposed that alter surface runoff during subsequent stages of the Project, compliance with the SPP requirements will be subject to further detailed assessment.

This section summarises the development outcomes for Assessable Development in accordance with the GRC Planning Scheme - Flood Hazard Overlay Code[6].

[5] https://cabinet.qld.gov.au/documents/2017/May/SPP/Attachments/Policy.pdf
[6] https://www.gladstone.qld.gov.au/files/assets/public/v/3/build-and-develop/planning-schemes/documents/planning-scheme-version-21/planning-scheme-version-2_1-part-9-development-codes.pdf

Table 15 Rural zone code

Extract of table 6.2.22.3.1 – Accepted development subject to requirements and assessable development

Performance Outcome	Acceptable Outcome	Assessment the Project
For all assessable development		
Design amenity		
PO16 Development ensures ecological values, habitat corridors and soil and water quality are protected, having regard to: (a) maximising the retention of vegetation and the protection of vegetation from the impacts of development (b) minimising the potential for erosion and minimisation of earthworks (c) maximising the retention and protection of natural drainage lines and hydrological regimes, and (d) avoidance of leeching by nutrients, pesticides or other contaminants, or potential for salinity.	No acceptable outcome is nominated.	**Complies with PO16** The Project Disturbance Footprint has been developed to minimum disturbance to the existing environment. This can be achieved through the following measures: • If locating a monopole within the 1% AEP flood zone is unavoidable, the structure will be engineered to withstand inundation, including potential debris loading and erosion effects. • Access tracks at minor waterway crossing are assumed to be built at existing ground level with minimum disturbance to the existing ground and surface runoff. • Moderate and high-risk waterway crossings along the access tracks will have dedicated waterways crossings (such as culverts or floodways), to maintain natural drainage lines and hydrological regimes are maintained. • Construction of switchyard will occur outside the 0.2% AEP (1 in 500) flood extent. • Measures will be taken to protect ecological values, habitat corridors, and soil and water quality. • Avoidance of using herbicide or other contaminated materials. • A Stormwater Management Plan (SMP) and an Erosion and Sediment Control Plan (ESCP) will be implemented during construction.

Performance Outcome	Acceptable Outcome	Assessment the Project
		• Minimal impact to the existing ground, retention of existing vegetation and rehabilitation of Project Disturbance Footprint • Refer to design recommendations in Section 6.1.

Table 16 Development design code

Extract of table 9.3.2.3.1 –Accepted development subject to requirements and assessable development

Performance Outcome	Acceptable Outcome	Assessment for the Project
For all assessable development		
Stormwater Management		
PO5 Stormwater management is designed and operated to: (a) ensure that adjoining land and upstream and downstream areas are not adversely affected through any ponding or changes in flows, and (b) direct stormwater to a lawful point of discharge through competently designed and constructed outlet works in a manner that reflects the predevelopment status.	**AO5.1** Development does not result in an increase in flood level flow velocity or flood duration on upstream, downstream or adjacent properties. **AO5.2** Stormwater (including roof and surface water) is conveyed to the kerb and channel or other lawful point of discharge in accordance with the requirements of the Engineering design planning scheme policy.	**Will Comply with AO5.1 and AO5.2** Once the final design incorporates the recommended measures outlined in Section 6.1, the Project will meet required compliance with **AO5.1** and **AO5.2**.
PO6 Stormwater drainage network elements are designed and constructed with the capacity to control stormwater flows under normal and minor system blockage conditions for the applicable defined flood event ensuring there is no damage to property or hazards for motorists.	**AO6** Stormwater infrastructure is designed and constructed in accordance with the requirements of the *Engineering design planning scheme policy*.	**Will comply with AO6** Some local drainage works may be required to safely drain the runoff from the switchyard and divert the external watercourses running around it. The system will be designed in compliance with AO6.

Performance Outcome	Acceptable Outcome	Assessment for the Project
PO23 Stormwater management systems: (a) implement water sensitive urban design (WSUD) principles that: (i) protect natural systems and waterways (ii) allow for the detention of stormwater instead of rapid conveyance (iii) minimise impervious areas (iv) utilise stormwater to conserve potable water (v) integrate stormwater treatment into the landscape (vi) ensure water quality values are protected (b) where privately owned must be maintained (including costs) for the life of the system (c) provide for safe access and maintenance (d) maintain natural drainage lines and adequate filtering and settlement of sediment for the protection of watercourses, coastal wetlands and beaches from point source and non–point source stormwater discharges, and (e) are designed to minimise ongoing maintenance costs	**AO23** Stormwater management systems are designed and constructed in accordance with the *Engineering design planning scheme policy*. Note—A site stormwater quality management plan (SQMP) is prepared in accordance with *Engineering design planning scheme policy* and the State Planning Policy requirement for stormwater quality treatment measures.	**Will comply with AO23** Any relevant design of these features will be in compliance with AO23.
PO24 Development allows for sufficient site area to accommodate an effective stormwater management system.	No acceptable outcome specified.	**Complies with PO24** Sufficient site area is available to accommodate the works with a minimal Project Disturbance Footprint, and therefore a formal stormwater management system may not be required. Additionally, localised stormwater such as catch drains around the switchyard will be designed in detailed design phase as required.

Performance Outcome	Acceptable Outcome	Assessment for the Project
PO25 Development provides for the orderly development of stormwater infrastructure within a catchment, having regard to: (a) existing capacity of stormwater infrastructure and ultimate catchment conditions (b) discharge for existing and future upstream development.	No acceptable outcome specified.	**Complies with PO25** The switchyard is situated at a high elevation and is located outside of the floodplain extent. The waterway classification maps show that the switchyard will intercept 2 low-risk local flow path areas. Therefore, drainage channel at the boundary of the switchyard is recommended, subject to confirmation during detailed design phase. Once the final design incorporates the recommended measures outlined in Section 6.1, the Project will comply with the requirements of **PO25.**
PO26 Construction activities for the development avoid or minimise adverse impacts on stormwater quality.	**AO26** The release of sediment–laden stormwater is avoided for the nominated design storm, and minimised when the nominated design storm is exceeded, by addressing design objectives listed below in Table 9.3.1.3.2—Construction phase, or local equivalent for: (a) drainage control (b) erosion control (c) sediment control, and (d) water quality outcomes. Note—An Erosion and Sediment Control Plan (ESCP) is prepared by a suitably qualified person that demonstrates: • erosion and sediment control practices (including any proprietary erosion and sediment control products) are designed, installed, constructed, operated, monitored and maintained, and any other erosion and sediment control practices are carried out in accordance with local conditions, or	**Will comply with AO26** Site Stormwater Management Plan and ESCP will be prepared during the detailed design phase, considering the proposed construction methodology.

Performance Outcome	Acceptable Outcome	Assessment for the Project
	how stormwater quality will be managed in accordance with an acceptable regional or local guideline so that target contaminants are treated to a design objective at least equivalent to this Acceptable outcome.	
Bridge and culvert work		
PO30 Bridges and culverts for flood immunity: (a) are designed and located to minimise traffic disruption (b) improve public safety (c) provides for fauna habitat movement where possible, and (d) makes appropriate allowance for active transport.	**AO30** Bridges and culvert works are provided in accordance with the *Engineering design planning scheme policy*.	**Complies with AO30** Access tracks crossing minor flowpath ephemeral waterway areas will be constructed at existing ground level, with only minor local adjustments to maintain natural sheet flow, thereby preserving current flood immunity. Access tracks at moderate, and high-risk waterway crossings will include dedicated culvert or floodway crossings, to improve trafficability. Flood depth markers may be included at these crossings where required, to minimise the risk of people driving in potentially hazardous conditions.
PO39 Development protects water environmental values in existing natural waterways by ensuring: (a) environmental values in downstream waterways are protected (b) any groundwater recharge areas are not affected (c) the location of the non-tidal artificial waterway incorporates low lying areas of a catchment connected to an existing waterway, and (d) existing areas of ponded water are included.	No acceptable outcome specified.	**Complies with PO39** All three environmental values outlined in Performance Outcome will not be adversely affected by the Project. As recommended in Section 6.1, the stormwater strategy will be designed in the detailed design phase to demonstrate the following: • Peak-flow, volume and quality of runoff mirror pre-development conditions, safeguarding downstream waterways. • Groundwater recharge functions will remain intact and protected from contamination. • Detention and bio-retention features are deliberately sited within natural low-lying zones

Performance Outcome	Acceptable Outcome	Assessment for the Project
		connected to existing flow paths, integrating any pre-existing ponded areas.
PO40 Development is designed such that non-tidal artificial waterways are located: (a) outside natural wetlands and any associated buffer areas (b) to minimise disturbing soils or sediments. And (c) to avoid altering the natural hydrologic regime in acid sulphate soil and nutrient hazardous areas.	No acceptable outcome specified.	**Not applicable** Artificial waterways are not proposed.
PO41 Development is compatible with existing tidal waterways where any tidal flow alteration does not adversely impact on the tidal waterway.	**AO41** Where development is located adjacent to, or is connected to, a tidal waterway by means of a weir, lock, pumping system or similar: (a) there is sufficient flushing or a tidal range greater than 0.3 m, and there is no introduction of salt water into freshwater environments.	**Not applicable** The Project does not impact on tidal waterways.
PO42 Any non-tidal artificial waterway associated with the development is designed and managed to function by: (a) providing amenity including aesthetics, landscaping and recreation (b) incorporating flood management measures (c) including stormwater harvesting as part of an integrated water cycle management plan, and (d) accommodating aquatic habitat.	No acceptable outcome specified.	**Not applicable** The Project does not propose any artificial waterways.
PO43	No acceptable outcome specified.	**Not applicable**

Performance Outcome	Acceptable Outcome	Assessment for the Project
Any non-tidal artificial waterways associated with the development are designed, managed and operated to achieve water quality objectives in natural waterways through: (a) monitoring and maintenance programs adaptively manage water quality in any non–tidal artificial waterway to achieve relevant water–quality objectives downstream of the waterway, and (b) monitoring and maintenance programs that ensure aquatic weeds achieve a low percentage of coverage of the water surface area (less than 10%) and pests and vectors (such as mosquitoes) are managed through avoiding stagnant water areas, providing for native fish predators, and any other best practices for monitoring and treating pests. Note—Achieving compliance with the performance outcomes is to be undertaken by suitably qualified persons such as a registered professional engineer, Queensland (RPEQ) with specific experience in establishing and managing artificial waterways Note—Any non–tidal artificial waterway is managed and operated by a responsible entity under agreement for the life of the waterway. The responsible entity is to implement a deed of agreement for the management and operation of the waterway that: • identifies the waterway • states a period of responsibility for the entity • states a process for any transfer of responsibility for the waterway • states required actions under the agreement for monitoring the water quality of the waterway and receiving waters		The Project does not propose any non-tidal artificial waterways.

Performance Outcome	Acceptable Outcome	Assessment for the Project
• states required actions under the agreement for maintaining the waterway to achieve the outcomes of this code and any relevant conditions of a development approval, and • identifies funding sources for the above, including bonds, headworks charges or levies.		

Table 17 Flood hazard overlay code

Extract of table 8.2.7.3.1 –Accepted development subject to requirements and assessable development[7]

Performance Outcome	Acceptable Outcome	Assessment for the Project
For all assessable development		
Siting of development		
PO1 Development: a. does not provide unacceptable risks to people, property or the environment from flood hazard impacts or, the risks are mitigated to an acceptable or tolerable level, or b. does not intensify an existing use in flood hazard area in order to avoid risks to people, property or the environment or the risks are mitigated to an acceptable or tolerable level. Note—The terms 'acceptable risk' and 'tolerable risk' are defined in State Planning Policy Guideline – Guidance on flood, bushfire and landslide hazards. The National Construction Code, Building Regulation 2021 and the Queensland Development Code Mandatory Part 3.5 may also establish requirements with which development will need to comply.	**AO1** Development, including intensification of an existing use, does not occur on land within a flood hazard area. OR A site specific flood hazard assessment demonstrates that risks associated with the development can be mitigated to an acceptable or tolerable level. OR If the premises is located in a Flood Hazard Investigation Area in the Flood Hazard overlay mapping, a written notice issued by Council at its sole discretion, for the purposes of this acceptable outcome, confirms that it is satisfied that the performance outcome PO1 would be achieved without the need for a site specific flood hazard	**Complies with AO1** The premises is located outside the Flood Hazard Investigation Area identified on the Planning Scheme Overlay Maps. With the recommendations outlined in Section 6.1 implemented, the risks associate with the Project can be mitigated to an acceptable level.

[7] https://www.gladstone.qld.gov.au/files/assets/public/v/4/build-and-develop/planning-schemes/documents/planning-scheme-version-21/planning-scheme-version-2_1-part-8-overlays.pdf

Performance Outcome	Acceptable Outcome	Assessment for the Project
For all assessable development		
	assessment and/or a Registered Professional Engineer of Queensland certifying the actual level of flood risk for the site and measures required to ensure the risk associated with the development can be mitigated to an acceptable or tolerable level. Note - In exercising its discretion, Gladstone Regional Council may, without limitation, have regard to: • the location and characteristics of the site • any existing flood studies or work being carried out in the course of undertaking flood studies which may be relevant to the site • any work undertaken by or on behalf of Gladstone Regional Council in the course of locally verifying the extent of flood hazards which may be relevant to the site. Note—AS/NZ ISO 31000:2018 Risk management – Principles and guidelines provides guidance on identifying and managing risks. Table 8.2.7.3.3—Table to acceptable outcomes sets out the criteria for establishing the level of flood hazard. A Registered Professional Engineer of Queensland with expertise in undertaking risk and flood analysis is to certify the actual level of flood risk for the site and measures required to ensure the risk associated with the development can be mitigated to an acceptable or tolerable level.	
PO02 Development is sited to enable safe evacuation in the event of a flood.	AO2 Development has direct access to land above the Design Flood Estimate (DFE) by an evacuation route that is either above the DFE or has a	**Complies with PO2** Certain areas within the site are located above the 1% AEP flood level. However, the proposed access tracks connecting to Dawson Highway is expected

Performance Outcome	Acceptable Outcome	Assessment for the Project
For all assessable development		
	confirmed low or medium flood hazard rating. Evacuation routes do not include a high or extreme flood hazard area. OR If the premises is located in a Flood Hazard Investigation Area in the Flood Hazard overlay mapping, a written notice issued by Council at its sole discretion, for the purposes of this acceptable outcome, confirms that it is satisfied that the performance outcome PO1 would be achieved without the need for a site specific flood hazard assessment and/or a Registered Professional Engineer of Queensland certifying the actual level of flood risk for the site and measures required to ensure the risk associated with the development can be mitigated to an acceptable or tolerable level. Note - In exercising its discretion, Gladstone Regional Council may, without limitation, have regard to: the location and characteristics of the site any existing flood studies or work being carried out in the course of undertaking flood studies which may be relevant to the site any work undertaken by or on behalf of Gladstone Regional Council in the course of locally verifying the extent of flood hazards which may be relevant to the site. Note—The criteria for a low or medium flood hazard is defined in Table 8.2.7.3.3—Table to acceptable outcomes. A Registered Professional Engineer of Queensland with expertise in undertaking flood analysis is to certify the actual level of risk for the site in accordance with those criteria.	to experience temporary inundation due to local catchment flooding. The results showed that dry land is accessible from other locations along the proposed access routes for events up to the 1% AEP flood event. It should be noted that access tracks crossing minor flowpath ephemeral waterway areas will be constructed at existing ground level, with only minor local adjustments to maintain natural sheet flow, thereby maintaining current flood immunity. Access tracks at moderate and high-risk waterway crossings will include dedicated culvert or floodway crossings, to improve trafficability. Flood depth markers may be included at these crossings where required, to minimise the risk of individuals driving in potentially hazardous conditions.

Performance Outcome	Acceptable Outcome	Assessment for the Project
For all assessable development		
PO3 Signage is provided within extreme, high and medium flood hazard areas to alert residents and visitors to the flood hazard.	AO3 Signage is provided on site (regardless of whether the land is in public or private ownership) indicating: the position and path of all safe evacuation routes off the site, and if the site contains or is within 100m of a floodable waterway, hazard warning signage and depth indicators are also provided at key hazard points such as floodway crossings or entrances to low–lying reserves. If the premises is located in a Flood Hazard Investigation Area in the Flood Hazard overlay mapping, a written notice issued by Gladstone Regional Council at its sole discretion, may for the purposes of this acceptable outcome, exempt compliance with AO3(a). Note - In exercising its discretion, Gladstone Regional Council may, without limitation, have regard to: the location and characteristics of the site any existing flood studies or work being carried out in the course of undertaking flood studies which may be relevant to the site any work undertaken by or on behalf of Gladstone Regional Council in the course of locally verifying the extent of flood hazards which may be relevant to the site.	**Complies with AO3** The Project Disturbance Footprint is located outside the Flood Hazard Investigation Area identified on the Planning Scheme Overlay Maps. For those locations where the monopoles and access track are subjected to flood inundation (1% AEP), relevant flood warning signs are to be provided within the Project Disturbance Footprint as part of the Project's operational phase.

Performance Outcome	Acceptable Outcome	Assessment for the Project
For all assessable development		
Building floor levels		
PO6 The floor levels of residential uses and other sensitive land uses are raised above the DFE to provide an allowance above the main flood way for hydraulic gradient, the effects of wave action, uncertainty in estimating flood water heights and unforeseen variation in local flood behaviour.	AO6.1 Habitable rooms have a minimum floor level at least 1000mm above the DFE. OR Where involving an extension to an existing residential use that has habitable rooms below the DFE, any extension does not exceed 25m^2 GFA.	**Not Applicable AO6.1** No habitable floors.
	AO6.2 Floor levels of non–habitable rooms (other than Class 10 buildings) are above the DFE, or allow for the flow through of floodwaters.	**Complies with conditions AO6.2** The proposed switchyard will be constructed more than 2 m above 0.2% AEP (1 in 500 AEP). Refer to Section 4.4.2.2. Laydown area LA2 (refer to Section 4.4.2.2) is above DFE (1% AEP).
	AO6.3 Where a building has been destroyed by flood, the floor levels of the reconstructed building accord with AO7.1 and AO7.2.	**Not applicable AO6.3** No reconstruction.
	AO6.4 The filling height of building footprints does not exceed 1000mm and has batters not steeper than 1 in 6.	**Not applicable AO6.4** No major filling is proposed.
PO7 Non–residential development is designed and located to minimise damage to property from flooding impacts.	AO7.1 The floor level of non–residential buildings (other than Class 10 buildings) is above the DFE or allows for the flow through of floodwaters on the ground floor.	**Complies with AO7.1** All the floor levels of the switchyard and laydown areas are above the DFE.

Performance Outcome	Acceptable Outcome	Assessment for the Project
For all assessable development		
	AO7.2 Where located less than 1000mm above the DFE materials stored on–site are those that are easily able to be moved off–site in a flood event.	**Complies with condition AO7.2** The proposed laydown areas are above the DFE level (refer to Section 4.4.2.2).
Earthworks		
PO8 Development, including any earthworks or excavation work in excess of 50 cubic metres, must: not adversely impact on or change the flood characteristics of a floodplain or waterway not reduce existing flood storage and flow capacity avoid any physical change to a floodplain or natural waterway avoid increased scour and erosion not increase the depth, velocity or direction of the flow, the rate of flood level rise or the duration of inundation on land external to the site, and not substantially remove any riparian or riverine vegetation.	No acceptable outcome nominated.	**Complies with PO8** Given the proposed monopoles have small, isolated footprints, the potential impacts on overland flow are expected to be minimal. The monopole location will be carefully designed during the detailed design phase with consideration given to placing them outside of the 1% AEP flood extent where possible. If this cannot be achieved, the monopoles will be engineered to withstand inundation, including debris loading and potential erosion effects. Access tracks crossing minor flowpath ephemeral waterway areas will be constructed at existing ground level, with only minor local adjustments to maintain natural sheet flow, and thereby avoiding any flood impacts. Access tracks at moderate and high-risk waterway crossings (and low-risk waterway with culvert crossing requirement) will include dedicated culvert or floodway crossings, to improve trafficability. Potential flood impacts arising from this can be mitigated to an acceptable level through appropriate design measures. For example, by including sufficient culvert cells to reduce concentration of flowpaths, lowering the invert level of the culvert cells, or lowering the elevation of the crossings.

Performance Outcome	Acceptable Outcome	Assessment for the Project
For all assessable development		
		The switchyard is located at high level and intercepts a few of the existing small watercourses. The proposed switchyard is located outside of floodplain area. Therefore, local drainage works to safely convey runoff from the switchyard and divert the external watercourses, or potential requirement for bioretention system, will be addressed during the detailed design phase.
Community infrastructure		
PO11 Community infrastructure is able to function effectively during and immediately after flood events.	AO11 Community infrastructure is provided at or above the recommended flood immunity level specified in Table 8.2.7.3.2—Recommended flood immunity levels for community infrastructure.	**Complies with PO11** The proposed infrastructure within the Project Disturbance Footprint is either designed to be above 0.5% AEP flood level or will be engineered to withstand the impact of inundation. This will allow the OHTL and switchyard (Option A or Option B) to function as normal during flood events.
PO12 Essential services infrastructure (e.g. gas, water supply, sewerage, telecommunications, and on–site electricity,) maintains its function during and immediately after a DFE flood event.	AO12 Any components of infrastructure that are likely to fail to function or may result in contamination when inundated by flood water (e.g. electrical switchgear and motors, water supply pipeline air valves) are: located above the DFE, or designed, sited and operated to prevent floodwater intrusion/infiltration.	**Complies with PO12** The proposed switchyard is design above 0.5% AEP flood level. Monopoles located within the flood prone areas will be engineered to withstand impacts of inundation.
PO13 Infrastructure is designed, sited and operated to resist hydrostatic and hydrodynamic forces as a result of inundation by a DFE.	No acceptable outcome nominated.	**Complies with PO13** The majority of the infrastructure is located above the DFE extent. Any components subjected to inundation will be engineered to withstand the associated impacts.

Table 18 and Table 19 provide the assessment details for State Code 1 (State-controlled Roads) and State Code 2 (Railway Lines), respectively.

Table 18 State Code 1: Development in a State-controlled road environment

Extract of table 1.1

Performance Outcome	Acceptable Outcome	Assessment for The Project
PO8 Stormwater run-off or overland flow from the development site does not create or exacerbate a safety hazard in a state-controlled road.		**Complies with PO8** No adverse impacts on the state-controlled road are anticipated.
PO9 Stormwater run-off or overland flow from the development site does not result in a material worsening of operating performance of the state-controlled road or road transport corridor infrastructure.		**Complies with PO9** No adverse impacts to the operation of the state-controlled road are anticipated.
P10 Stormwater run-off or overland flow from the development site does not interfere with the structural integrity or physical condition of the state-controlled road or road transport corridor infrastructure		**Complies with PO10** No adverse impacts on the structural loading are anticipated.
PO11 Development ensures that stormwater is lawfully discharged.	**AO11.1** Development does not create any new points of discharge to a state-controlled road. AND **AO11.2** Development does not concentrate flows to a state-controlled road. AND **AO11.3** Stormwater run-off is discharged to a lawful point of discharge. AND **AO11.4** Development does not worsen the condition of an existing lawful point of discharge to the state-controlled road	**Complies with PO11/AO11** Neither flow concentration nor major changes to the stormwater runoff.

Performance Outcome	Acceptable Outcome	Assessment for The Project
PO12 Development does not result in a material worsening of flooding impacts within a state-controlled road.	**AO12.1** For all flood events up to 1% annual exceedance probability, development results in negligible impacts (within +/- 10mm) to existing flood levels within a state-controlled road. AND **AO12.2** For all flood events up to 1% annual exceedance probability, development results in negligible impacts (up to a 10% increase) to existing peak velocities within a state-controlled road. AND **AO12.3** For all flood events up to 1% annual exceedance probability, development results in negligible impacts (up to a 10% increase) to existing time of submergence of a state-controlled road.	**Complies with PO12/AO12** Based on engineering judgement, no worsening of flooding conditions are anticipated.
PO13 Drainage infrastructure does not create a safety hazard in a state-controlled road corridor	**AO13.1** Drainage infrastructure is wholly contained within the development site, except at the lawful point of discharge. AND **AO13.2** Drainage infrastructure can be maintained without requiring access to a state-controlled road.	**Complies with PO13/AO13** Based on engineering judgement, no safety hazards have been identified within the state-controlled corridor.
PO14 Drainage infrastructure associated with, or within, a state-controlled road is constructed, and designed to ensure the structural integrity and physical condition of existing drainage infrastructure and the surrounding drainage network.		**Complies with PO14** No drainage infrastructure is proposed outside of the Project Disturbance Footprint.

Table 19 State Code 2: Development in a railway environment

Extract of table 2.1 –

Performance Outcome	Acceptable Outcome	Assessment for The Project
PO12 Stormwater run-off or overland flow from the development site does not create or exacerbate a safety hazard in a railway corridor.		**Complies with PO12** No adverse impacts on the railway corridor are anticipated.
PO13 Stormwater run-off or overland flow from the development site does not result in a material worsening of operating performance of the railway corridor, rail transport infrastructure or other rail infrastructure.		**Complies with PO13** No adverse impacts to the operation of the rail infrastructure are anticipated.
PO14 Stormwater run-off or overland flow from the development site does not interfere with the structural integrity or physical condition of the railway corridor, rail transport infrastructure or other rail infrastructure.		**Complies with PO14** No adverse impacts on the structural loading or integrity are anticipated.
PO15 Development does not result in a material worsening of flooding impacts within a railway corridor.		**Complies with PO15** Based on engineering judgement, no worsening of flooding conditions are anticipated.
PO16 Drainage infrastructure does not create a safety hazard in a railway corridor	**AO16.1** Drainage infrastructure is wholly contained within the development site. AND **AO16.2** Drainage infrastructure can be maintained without requiring access to a railway corridor	**Complies with PO16/AO16** Based on engineering judgement, no safety hazards have been identified within the railway corridor. Cross drainage infrastructure will have dedicated waterways crossings so that the natural drainage lines and hydrological regimes are maintained.

5.2 Callide Infrastructure Corridor State Development Scheme (Sep 2012)

In accordance with the SDA requirements (refer to Section 7.0 of SDA[8]), a material change of use of premises must not be undertaken without the appropriate approval from the OCG. Given that the proposed infrastructure will be delivered with minimal impact on use of the premises, the works are considered to be capable of meeting the objectives of the SDA requirements. There are no specific Objectives for stormwater or flooding in the Development Scheme.

Monopoles NP31 and NP32 are proposed within the Callide Infrastructure Corridor and are located outside any major waterways. The majority of the proposed access track also lies beyond major waterway extents (Figure 28). The assessment indicates that the minor increase in surface runoff generated by the proposed monopoles and access tracks is negligible, due to the small increase in impervious area and the dispersed configuration of the infrastructure relative to the size of the broader catchment. No impacts to the existing waterway were identified from the proposed monopoles NP31 and NP32 or from the section of access track situated within the DA3 Project Disturbance Footprint.

[8] https://www.coordinatorgeneral.qld.gov.au/__data/assets/pdf_file/0022/33529/callide-development-scheme.pdf

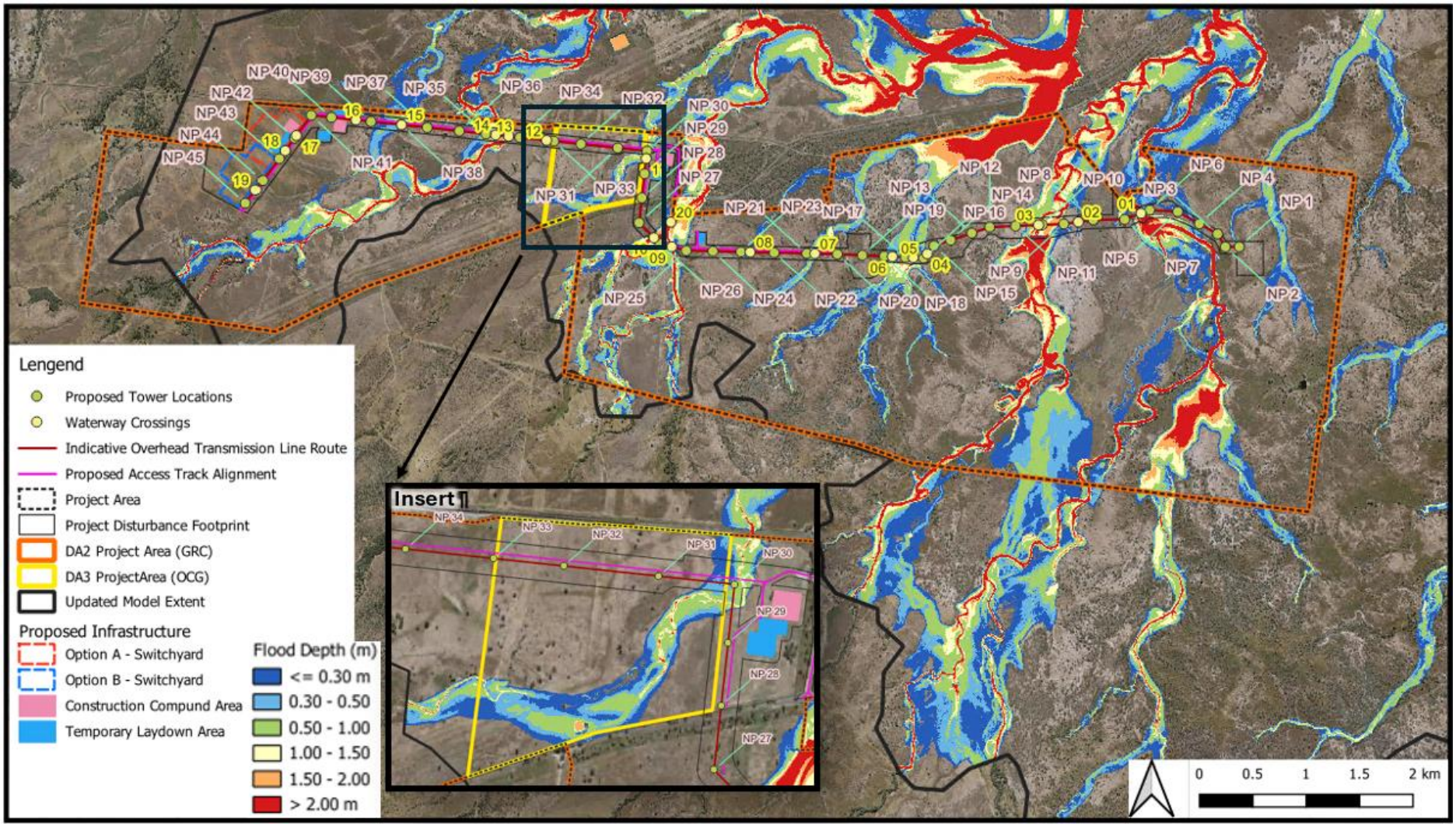


Figure 28 Callide Infrastructure Corridor State Development Scheme

6.0 Conclusions and recommendations

This report presents the stormwater management assessment and hydraulic modelling undertaken to evaluate flood behaviour within the Project Disturbance Footprint to support the Project's DAs. The outcomes of this assessment will also inform ongoing design development, ensuring that any potential adverse impacts on local flooding and stormwater flow paths are appropriately addressed through design refinement.

As outlined in Section 2.3 and 2.4, the Project Disturbance Footprint for this assessment comprises:

- Tower footprint: The proposed OHTL monopoles (NP1 to NP45)
- Access track assumptions: There are 2 sets of access track:
  - Transmission line proposed access track: The proposed access track for the transmission line. This study assesses existing flood behaviour only
  - Access tracks outside the Project Disturbance Footprint: These are addressed as part of DA1 and not included in this study
- Switchyard location: The proposed switchyard is located outside the mapped flood extent.

This report provides a summary of the existing hydraulic parameters within the Project Disturbance Footprint between monopole 01 and the switchyard (see Section 4.4.2), and provides corresponding flood maps in Appendix A.

The design intent is to ensure minimal to no change in local flood levels, flow paths, and hydrological behaviour. The proposed design layout and flood analysis for existing conditions indicate that:

- The switchyard (either option) will be situated outside of the floodplains, 1% AEP and 1 in 500 AEP
- The proposed monopoles will be designed outside of the 1% AEP flood extent where possible. If this cannot be achieved, the monopoles will be engineered to withstand inundation, including debris loading and potential erosion effects
- The proposed access track will be designed with appropriate cross-drainage measures to ensure that there are no or minor adverse impacts on flood behaviour.

The Wooderson Solar Farm hydraulic model was updated to incorporate climate change conditions. A simplified version of the original hydrologic model (refer to Section 4.2) was used to apply the required climate change rainfall adjustments. Based on the assessment, inflows to the hydraulic model were increased by a factor of 1.12 to meet the ARR2019 Version 4.2 SSP2–4.5 (Year 2030) climate change requirements. In addition, several RFFE sub-catchments were further refined and replaced with hydrographs generated from representative URBS sub-catchments to cover the extent of the OHTL & switchyard.

A total of 20 waterway crossings have been investigated along the Project Disturbance Footprint between monopole 01 and the switchyard. Of these crossings, the Department of Agriculture and Fisheries (DAF) classified 3 as moderate risk (amber), 2 as high risk (red), and 4 as major risk (purple) waterways (Table 7). The assessment indicates that the minor increase in surface runoff generated by the proposed switchyard, monopoles, and access tracks is negligible, given the small increase in impervious area and the dispersed nature of the infrastructure relative to the size of the broader catchment. This assessment also found that OHTL monopoles NP5, NP6, NP10, NP17, NP26, NP30, NP35, and NP38 may cause localised changes to surface runoff and interactions with adjacent waterways. All these monopoles are proposed within the extent of DA2. No impacts to the existing waterway were identified from the proposed monopoles NP31 and NP32, which are situated within DA3. Accordingly, the final siting of these OHTL monopoles should be carefully reviewed to minimise potential hydraulic and environmental impacts.

The proposed switchyard footprint intercepts up to 2 waterways (Option A – 2 waterways, Option B – 1 waterway), all classified as low-risk. These waterways will be intercepted by new drains.

Although impacts from the OHTL on surface runoff are expected to be minimal, careful consideration during the design, construction, operation, and maintenance phases is required to avoid unintended effects on surface water behaviour and the identified waterways.

The objective of this Stormwater Management Plan is to prevent or minimise adverse social and environmental impacts associated with stormwater runoff, ensuring acceptable stormwater quality and quantity outcomes. Under the recommendations provided in this report, the proposed OHTL works are not expected to result in unacceptable adverse social or environmental impacts on DA2 (GRC) and DA3 (OCG).

6.1 Recommendations

The proposed infrastructure is expected to have minimum impact on the site once the following recommendations are implemented in the final design:

- The proposed locations for the monopoles have been strategically designed to be situated outside the 1% AEP flood extent. In instances where placement within this flood zone is unavoidable, the monopoles will be engineered to withstand inundation, including potential debris loading and erosion effects. Monopoles such as NP5, NP6, NP10, NP17, NP26, NP30, NP35, and NP38 will undergo careful review during the detailed design phase to minimise potential hydraulic and environmental impacts, noting the small footprint of the monopole foundations. Where possible, these monopoles should be constructed outside of the 1% AEP flood extent. Where this is not possible, the pole design will be engineered to withstand the impact of inundation.
- Access tracks crossing minor flowpath ephemeral waterway areas will be constructed at existing ground level, with only minor local adjustments to maintain natural sheet flow, and as such not causing flood impacts.
- Access tracks at waterway crossings that require culvert installations will incorporate dedicated culvert or floodway structures to improve trafficability. In accordance with the ADR, potential flood impacts associated with these crossings can be mitigated through appropriate design measures, such as providing sufficient culvert cells to avoid concentrating flowpaths, lowering culvert invert levels, or reducing the overall crossing elevation. Final sizing should be refined during the detailed design phase.
- Prior to a storm event, any material stored on-site below 1 m above the Defined Flood Event (DFE) level, which is 1% AEP, is to be relocated or removed from the Project Disturbance Footprint. All on-site material storage shall be maintained at least 1 m above DFE flood extent.
- The proposed switchyard is located outside the mapped flood extent. The switchyard is located at high level and is intercepting a few of the existing low-risk local flow path areas, therefore localised stormwater management measures, such as catch drains around the switchyard, sediment basins or bioretention systems will be designed during the detailed design phase.
- Once the design floor levels of the critical infrastructure (switchyard and monopoles) are finalised, the flood level immunity of those assets must be confirmed.

7.0 References

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URBS A Rainfall Runoff Routing Model for Flood Forecasting & Design', D.G. Carroll, Version 6.60, September 2021.

Wooderson Solar Farm – Surface Water Impact Assessment; WRM; 28 March 2025.

Appendix A

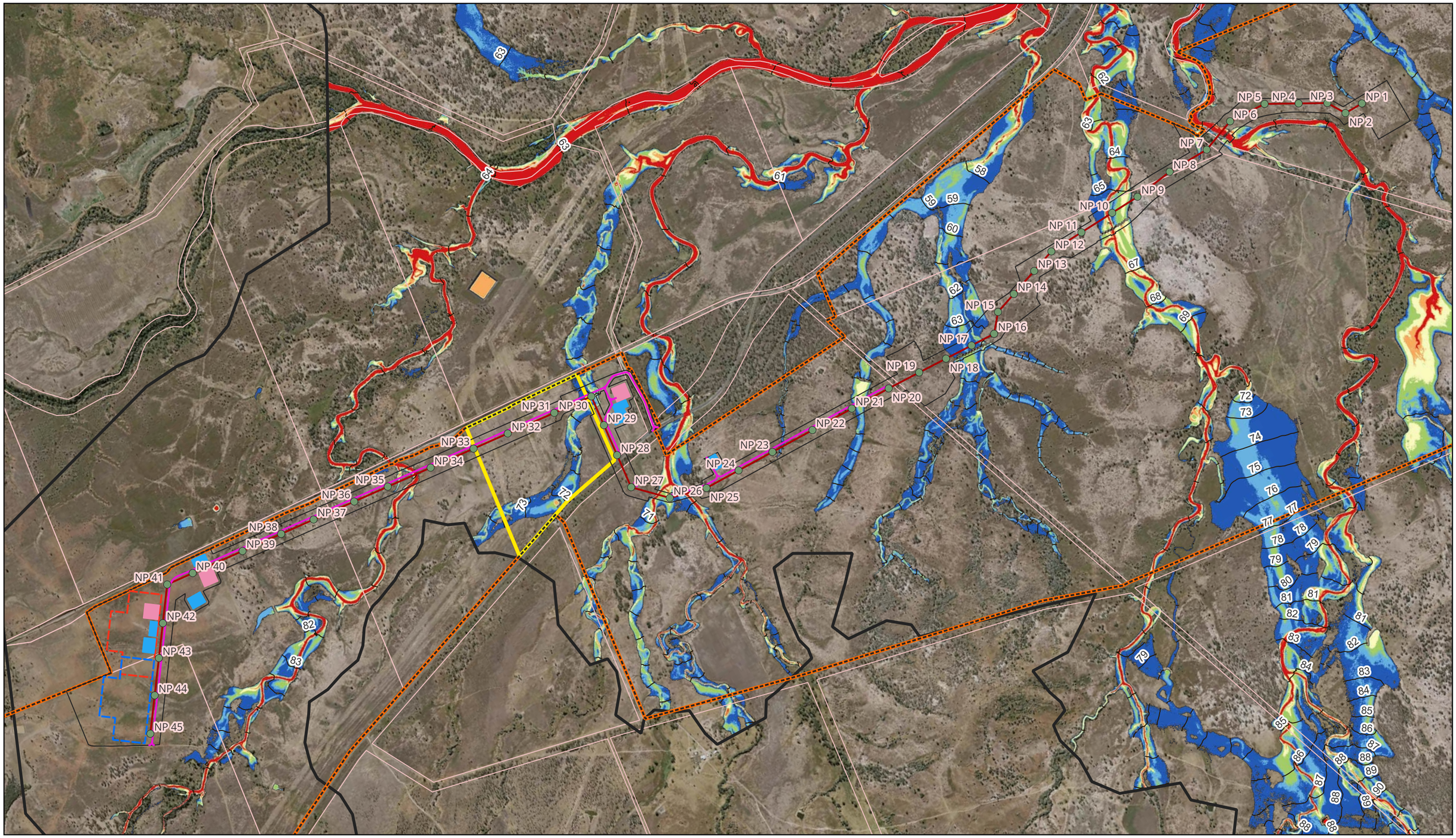
Flood maps

Appendix A Flood maps

Table 20 Flood maps

Map ID	Description	Event
010_D	Depths (m) and Flood Level (m AHD)	10% AEP
001_D	Depths (m) and Flood Level (m AHD)	1% AEP
P02_D	Depths (m) and Flood Level (m AHD)	1 in 500 AEP
010_V	Velocity (m/s)	10% AEP
001_V	Velocity (m/s)	1% AEP
P02_V	Velocity (m/s)	1 in 500 AEP
010_Z	Flood Hazard Category	10% AEP
001_Z	Flood Hazard Category	1% AEP
P02_Z	Flood Hazard Category	1 in 500 AEP

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DATUM GDA 2020, PROJECTION MGA ZONE 56

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Legend

- Proposed Tower Locations
- Proposed Access Track
- Indicative Overhead Transmission Line Route
- 10% AEP Flood Level (m AHD)
- Project Disturbance Footprint
- Project Area
- DA2 Project Area (GRC)
- DA3 ProjectArea (OCG)

Proposed Infrastructure

- Option A - Switchyard
- Option B - Switchyard
- Construction Compound Area
- Temporary Laydown Area
- Land Parcels
- Model Boundary

10% AEP Depth (m)

- <= 0.30 m
- 0.30 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- > 2.00 m

Data Sources:
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WOODERSON SOLAR FARM

Surface Water Impact Assessment

Depths (m) and Levels (m AHD)
Existing Scenario
10% AEP

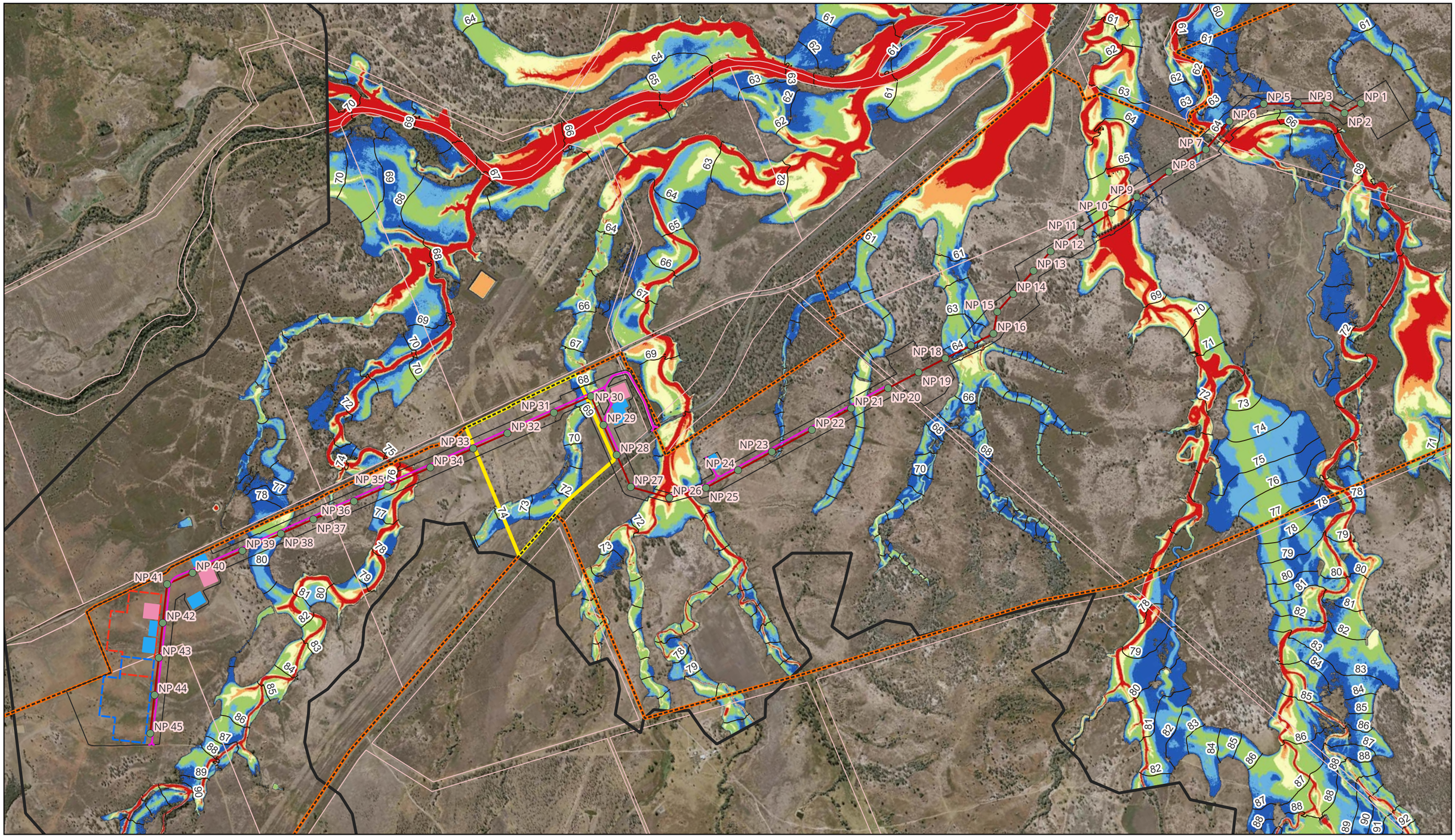
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VERSION	2

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DATUM GDA 2020, PROJECTION MGA ZONE 56

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Legend

- Proposed Tower Locations
- Proposed Access Track
- Indicative Overhead Transmission Line Route
- 1% AEP Flood Level (m AHD)
- Project Disturbance Footprint
- Project Area
- DA2 Project Area (GRC)
- DA3 ProjectArea (OCG)

Proposed Infrastructure

- Option A - Switchyard
- Option B - Switchyard
- Construction Compound Area
- Temporary Laydown Area
- Land Parcels
- Model Boundary

1% AEP Depth (m)

- <= 0.30 m
- 0.30 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- > 2.00 m

Data Sources:
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WOODERSON SOLAR FARM

Surface Water Impact Assessment

Depths (m) and Levels (m AHD)
Existing Scenario
1% AEP

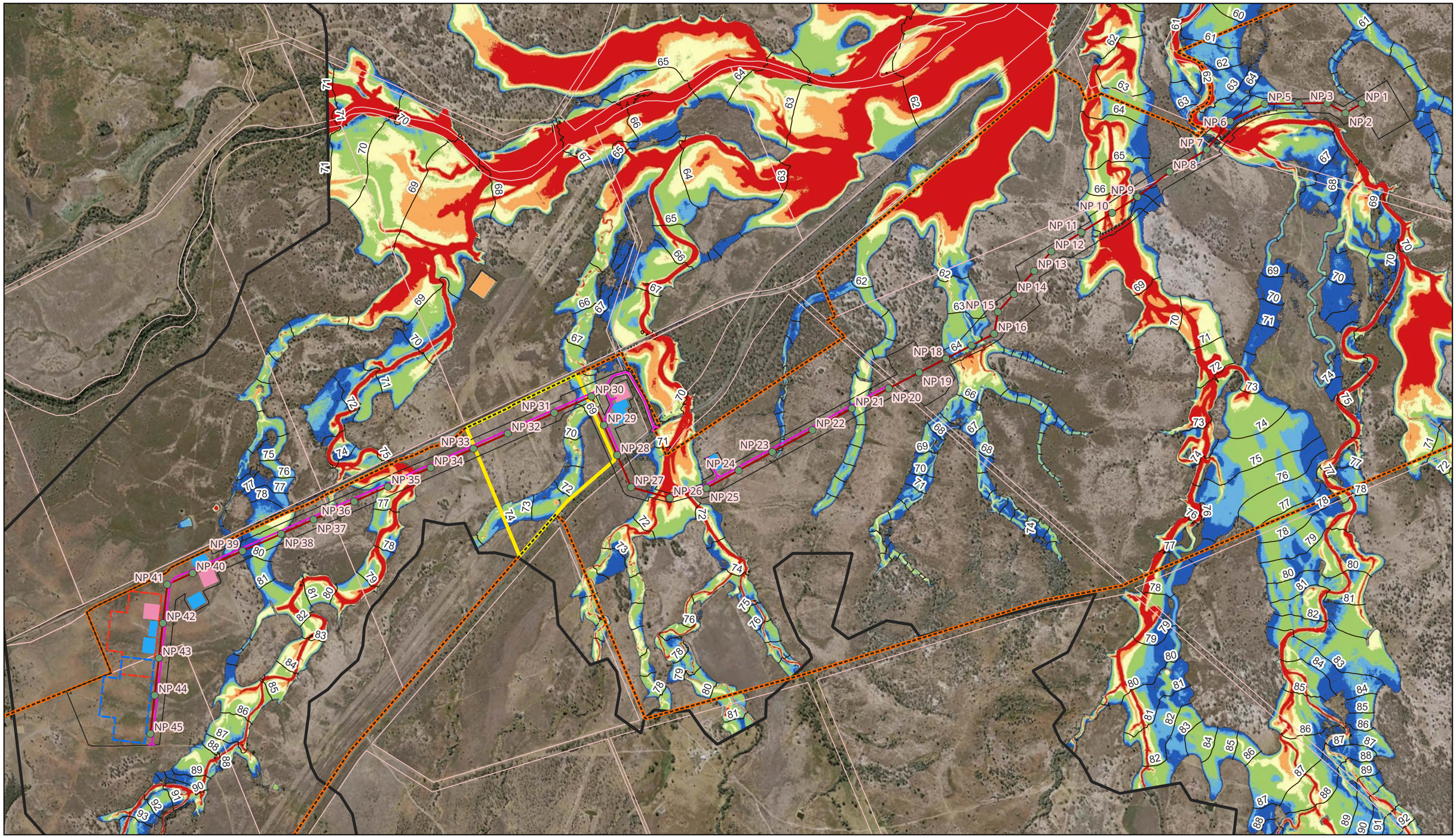
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DATUM GDA 2020, PROJECTION MGA ZONE 56

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Legend

- Proposed Tower Locations
- Proposed Access Track
- Indicative Overhead Transmission Line Route
- 1 in 500-year Flood Level (m AHD)
- Project Disturbance Footprint
- Project Area
- DA2 Project Area (GRC)
- DA3 ProjectArea (OCG)

Proposed Infrastructure

- Option A - Switchyard
- Option B - Switchyard
- Construction Compound Area
- Temporary Laydown Area
- Land Parcels
- Model Boundary

1 in 500-year Depth (m)

- <= 0.30 m
- 0.30 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- > 2.00 m

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WOODERSON SOLAR FARM

Surface Water Impact Assessment

Depths (m) and Levels (m AHD)
Existing Scenario
1 in 500-year

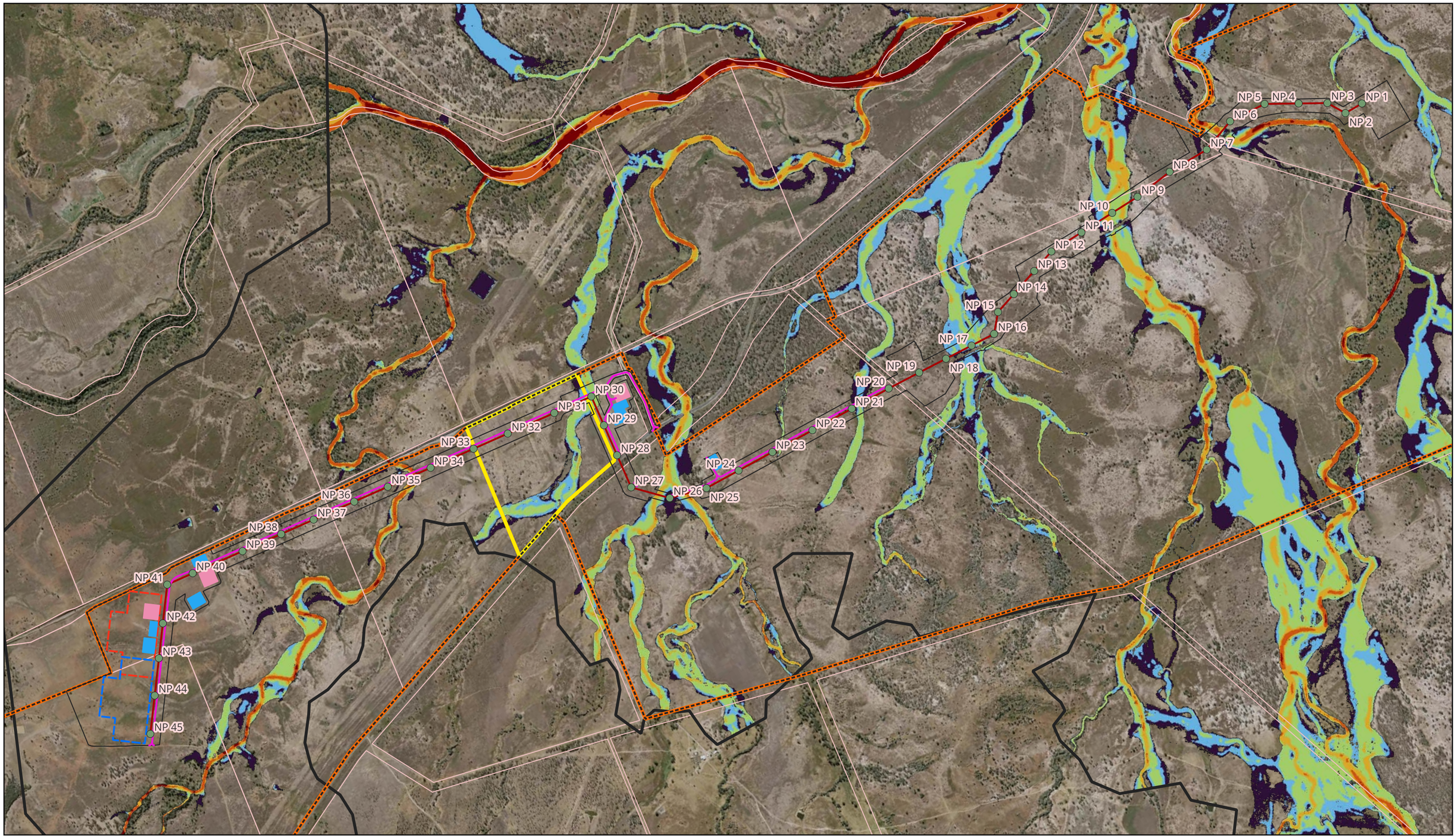
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Legend

- Proposed Tower Locations
- Proposed Access Track
- Indicative Overhead Transmission Line Route
- Project Disturbance Footprint
- Project Area
- DA2 Project Area (GRC)
- DA3 ProjectArea (OCG)

Proposed Infrastructure

- Option A - Switchyard
- Option B - Switchyard
- Construction Compound Area
- Temporary Laydown Area
- Land Parcels
- Model Boundary

10% AEP Velocity (m/s)

- <= 0.30 m/s
- 0.30 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- > 2.00 m/s

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Surface Water Impact Assessment

Velocities (m/s)
Existing Scenario
10% AEP

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VERSION	2

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NP 1 NP 2 NP 3 NP 4 NP 5 NP 6 NP 7 NP 8 NP 9 NP 10 NP 11 NP 12 NP 13 NP 14 NP 15 NP 16 NP 17 NP 18 NP 19 NP 20 NP 21 NP 22 NP 23 NP 24 NP 25 NP 26 NP 27 NP 28 NP 29 NP 30 NP 31 NP 32 NP 33 NP 34 NP 35 NP 36 NP 37 NP 38 NP 39 NP 40 NP 41 NP 42 NP 43 NP 44 NP 45

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DATUM GDA 2020, PROJECTION MGA ZONE 56

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Legend

- Proposed Tower Locations
- Proposed Access Track
- Indicative Overhead Transmission Line Route
- Project Disturbance Footprint
- Project Area
- DA2 Project Area (GRC)
- DA3 ProjectArea (OCG)

Proposed Infrastructure

- Option A - Switchyard
- Option B - Switchyard
- Construction Compound Area
- Temporary Laydown Area
- Land Parcels
- Model Boundary

1% AEP Velocity (m/s)

- <= 0.30 m/s
- 0.30 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- > 2.00 m/s

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Surface Water Impact Assessment

Velocities (m/s)
Existing Scenario
1% AEP

PROJECT ID	60565866
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VERSION	2

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NP 45

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DATUM GDA 2020, PROJECTION MGA ZONE 56

0 0.25 0.5 0.75 1 km

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Legend

- Proposed Tower Locations
- Proposed Access Track
- Indicative Overhead Transmission Line Route
- Project Disturbance Footprint
- Project Area
- DA2 Project Area (GRC)
- DA3 ProjectArea (OCG)

Proposed Infrastructure

- Option A - Switchyard
- Option B - Switchyard
- Construction Compound Area
- Temporary Laydown Area
- Land Parcels
- Model Boundary

1 in 500-year Velocity (m/s)

- <= 0.30 m/s
- 0.30 - 0.50
- 0.50 - 1.00
- 1.00 - 1.50
- 1.50 - 2.00
- > 2.00 m/s

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WOODERSON SOLAR FARM

Surface Water Impact Assessment

Velocities (m/s)
Existing Scenario
1 in 500-year

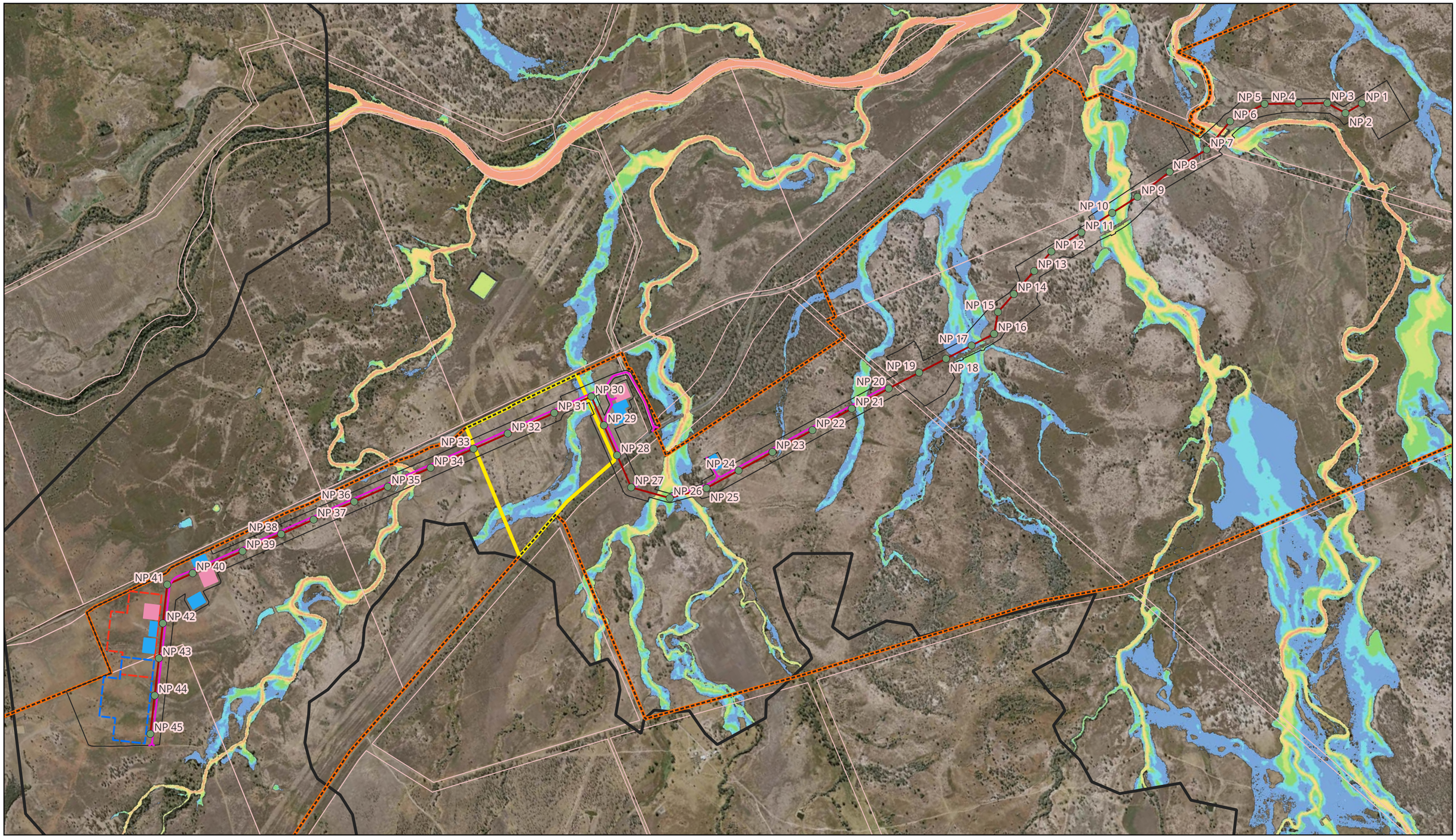
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Legend

- Proposed Tower Locations
- Proposed Access Track
- Indicative Overhead Transmission Line Route
- Project Disturbance Footprint
- Project Area
- DA2 Project Area (GRC)
- DA3 ProjectArea (OCG)

Proposed Infrastructure

- Option A - Switchyard
- Option B - Switchyard
- Construction Compound Area
- Temporary Laydown Area
- Land Parcels
- Model Boundary

10% AEP Flood Hazard Category

- H1 - Generally safe for people
- H2 - Unsafe for small vehicles
- H3 - Unsafe for vehicles, children and the elderly
- H4 - Unsafe for vehicles and people
- H5 - Less robust buildings vulnerable to failure
- H6 - Unsafe for people, vehicles and buildings

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WOODERSON SOLAR FARM

Surface Water Impact Assessment

Flood Hazard Category
Existing Scenario
10% AEP

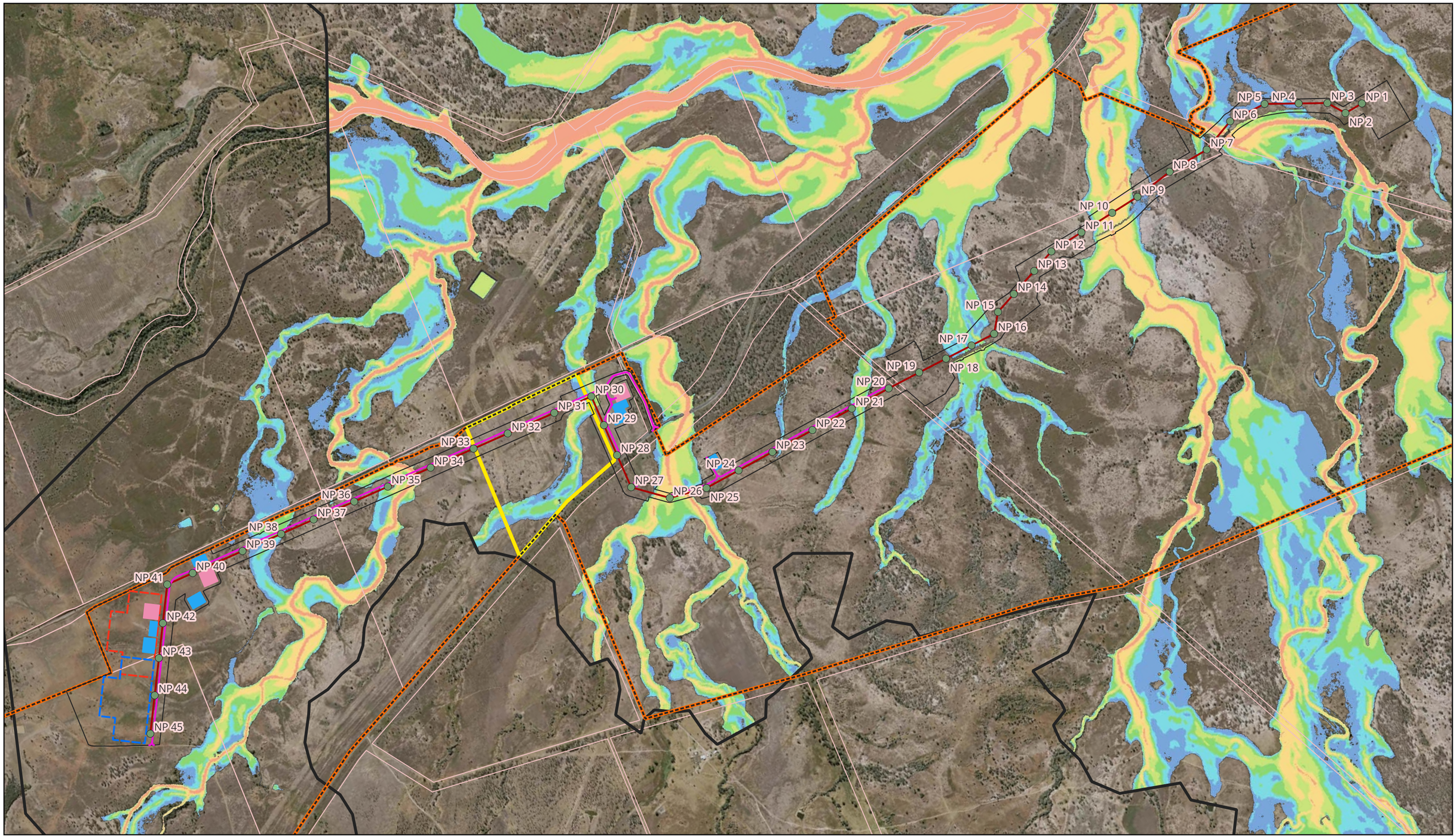
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DATUM GDA 2020, PROJECTION MGA ZONE 56

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Legend

- Proposed Tower Locations
- Proposed Access Track
- Indicative Overhead Transmission Line Route
- Project Disturbance Footprint
- Project Area
- DA2 Project Area (GRC)
- DA3 ProjectArea (OCG)

Proposed Infrastructure

- Option A - Switchyard
- Option B - Switchyard
- Construction Compund Area
- Temporary Laydown Area
- Land Parcels
- Model Boundary

1% AEP Flood Hazard Category

- H1 - Generally safe for people
- H2 - Unsafe for small vehicles
- H3 - Unsafe for vehicles, children and the elderly
- H4 - Unsafe for vehicles and people
- H5 - Less robust buildings vulnerable to failure
- H6 - Unsafe for people, vehicles and buildings

Data Sources:
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WOODERSON SOLAR FARM

Surface Water Impact Assessment

Flood Hazard Category
Existing Scenario
1% AEP

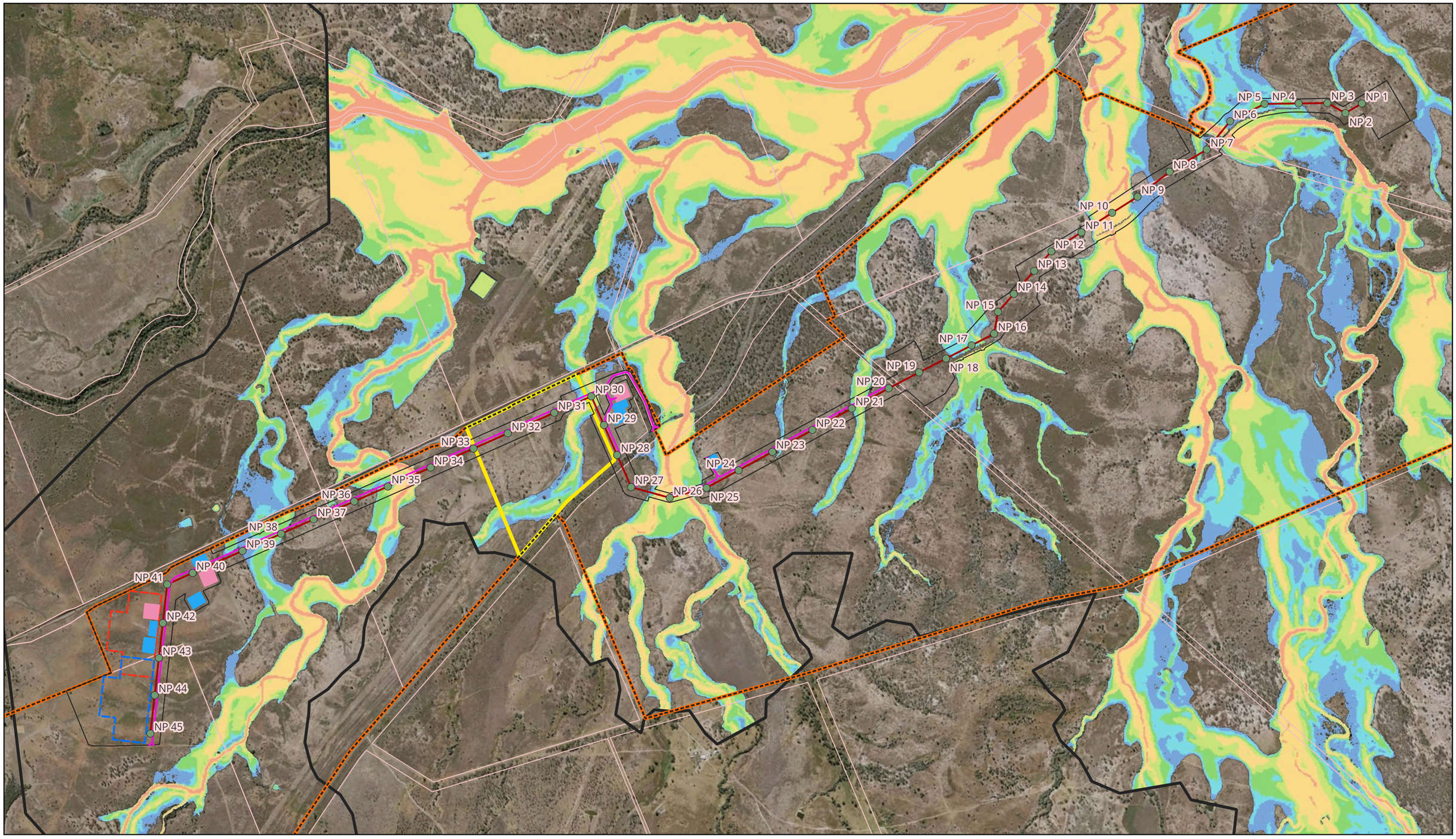
PROJECT ID	60565866
CREATED BY	Fernando, Frank
LAST MODIFIED	2026-02-27T14:32:35.301
VERSION	2

Map
001_Z

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A3 size

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DATUM GDA 2020, PROJECTION MGA ZONE 56

0 0.25 0.5 0.75 1 km

1:25,000 (when printed at A3)

Legend

- Proposed Tower Locations
- Proposed Access Track
- Indicative Overhead Transmission Line Route
- Project Disturbance Footprint
- Project Area
- DA2 Project Area (GRC)
- DA3 ProjectArea (OCG)

Proposed Infrastructure

- Option A - Switchyard
- Option B - Switchyard
- Construction Compund Area
- Temporary Laydown Area
- Land Parcels
- Model Boundary

1 in 500-year Flood Hazard Category

- H1 - Generally safe for people
- H2 - Unsafe for small vehicles
- H3 - Unsafe for vehicles, children and the elderly
- H4 - Unsafe for vehicles and people
- H5 - Less robust buildings vulnerable to failure
- H6 - Unsafe for people, vehicles and buildings

Data Sources:
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WOODERSON SOLAR FARM

Surface Water Impact Assessment

Flood Hazard Category
Existing Scenario
1 in 500-year

PROJECT ID	60565866
CREATED BY	Fernando, Frank
LAST MODIFIED	2026-02-27T14:32:54.229
VERSION	2

Map
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A3 size

Appendix B

Flood levels

Appendix B Flood levels

Table 20 illustrates locations where levels (both ground and flood levels) were extracted. The critical permanent infrastructure (monopoles and switchyard) should be designed so that the minimum design floor level is above the relevant threshold flood levels: 1% AEP for monopoles and 0.2% AEP (1 in 500 AEP) for the switchyard. In Table 21, nominated points prefixed with “A” identify locations associated with the switchyard and laydown areas. Nominated points prefixed with “NP” identify locations associated with the monopoles.

Table 21 Estimated levels m AHD

Location	Ground Level	Flood level		
		10% AEP	1% AEP	1 in 500 AEP
A01	69.82	-	-	-
A02	69.64	-	-	-
A03	69.06	-	-	-
A05	82.31	-	-	-
A06	80.79	-	-	-
A07	85.00	-	-	-
A10	91.97	-	-	-
A08	88.97	-	-	-
A09	93.28	-	-	-
A11	94.80	-	-	-
A12	94.94	-	-	-
NP 1	68.49	-	-	-
NP 2	72.48	-	-	-
NP 3	70.78	-	-	-
NP 4	65.19	-	-	65.45
NP 5	63.88		63.94	64.48
NP 6	63.81		63.88	63.99
NP 7	64.39	-	-	-
NP 8	65.75	-	-	-
NP 9	66.89	-	-	66.92
NP 10	65.20	65.48	66.15	66.43
NP 11	69.78	-	-	-
NP 12	73.88	-	-	-
NP 13	75.20	-	-	-
NP 14	70.26	-	-	-
NP 15	67.27	-	-	-
NP 16	65.44	-	-	-
NP 17	63.44	63.64	63.86	63.92
NP 18	66.03	-	-	-

Location	Ground Level	Flood level		
		10% AEP	1% AEP	1 in 500 AEP
NP 19	71.72	-	-	-
NP 20	74.09	-	-	-
NP 21	67.92	-	-	-
NP 22	79.29	-	-	-
NP 23	75.83	-	-	-
NP 24	82.36	-	-	-
NP 25	72.17	-	-	-
NP 26	69.33	70.52	71.52	71.78
NP 27	72.28	-	-	-
NP 28	71.32	-	-	-
NP 29	70.42	-	-	-
NP 30	67.83	68.09	68.35	68.46
NP 31	73.46	-	-	-
NP 32	78.89	-	-	-
NP 33	75.53	-	-	-
NP 34	81.69	-	-	-
NP 35	76.10	-	76.43	76.85
NP 36	78.61	-	-	-
NP 37	82.22	-	-	-
NP 38	78.50	-	79.24	79.38
NP 39	79.56	-	-	79.64
NP 40	88.53	-	-	-
NP 41	94.09	-	-	-
NP 42	92.79	-	-	-
NP 43	95.36	-	-	-
NP 44	93.26	-	-	-
NP 45	101.45	-	-	-

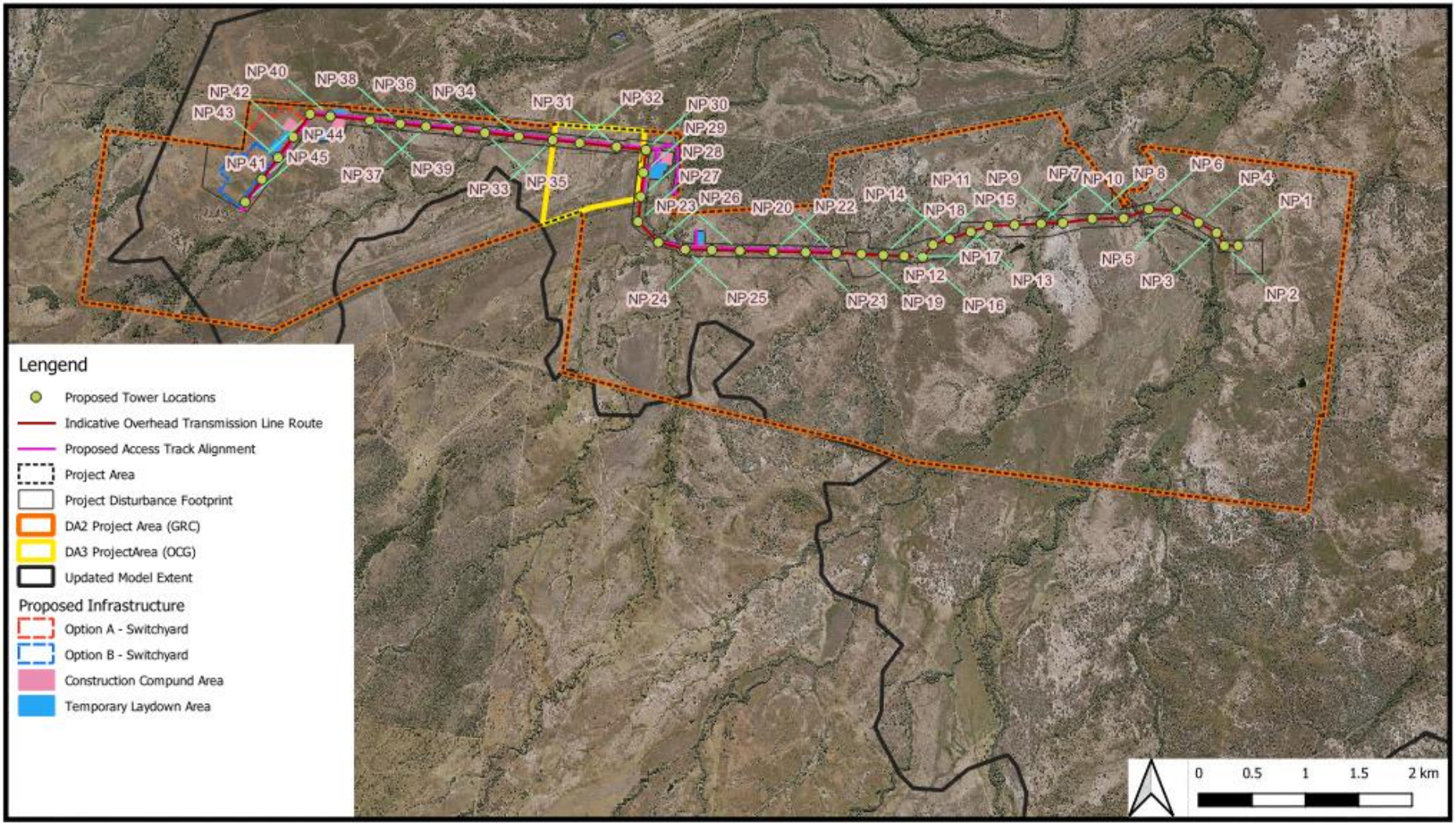


Figure 29 Level extracted location

Appendix L

Environmental Hazard, Health and Safety Assessment

Prepared for
Wooderson Solar Development Co Pty Ltd
ABN: 34 675 111 823

AECOM

Environmental Hazards, Health and Safety Assessment Report

02-Apr-2026
Wooderson Solar Farm Overhead Transmission Line and Switchyard

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Delivering a better world

Environmental Hazards, Health and Safety Assessment Report

Client: Wooderson Solar Development Co Pty Ltd

ABN: 34 675 111 823

Prepared by

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02-Apr-2026

Job No.: 60748426

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Originator	Dev Chandat/Miranda Ward
Checker/s	Katherine Janke/Renee Weightman
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			Name/Position	Signature
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Table of Contents

Definitions i
Executive Summary iii
1.0 Overview 1
1.1 Project Description 1
1.2.1 Project Area 2
1.2.2 Project Disturbance Footprint 2
1.3.8 Demobilisation and Rehabilitation 10
1.6 Workshop Details 10
2.0 Review Scope and Methodology 12
2.1 Scope 12
2.2 Assumptions and Limitations 12
2.2.1 Construction 12
2.2.2 Commissioning 13
2.2.3 Operation and Maintenance 13
2.2.4 Decommissioning 13
2.2.5 Project Development 13
2.3 Exclusions 14
2.4 Methodology 14
2.5 Division of Scope for EHHSA 16
3.0 Project Risk Identification 17
3.1 Existing Built Environment Hazards 17
3.1.1 Existing Public Infrastructure 17
3.1.2 Existing Private Infrastructure 17
3.2 Natural Environment Hazards 18
3.2.1 Bushfire 18
3.2.2 Flooding 19
3.2.3 Cyclone 19
3.2.4 Construction Activity Related Hazards 19
3.3 Summary of Hazard 19
4.0 Mitigations 23
4.1 Existing Built Environment 23
4.1.1 Existing Private Infrastructure 23
4.1.2 Existing Public infrastructure 24
4.2 Natural Environment 26
4.2.1 Bushfire 26
4.2.2 Flood and Cyclones 26
4.3 Construction Activity Related Hazards 27
4.3.1 Vehicle and Plant Equipment 27
4.3.2 Waste 27
4.3.3 Dangerous Goods and Hazardous Substances 27
4.3.4 Hot Works 28
5.0 Conclusion and Recommendations 29

List of Tables

Table 1 EHHSA Workshop Attendees 11
Table 2 Consequence Analysis 15
Table 3 Probability Analysis 16
Table 4 Risk Matrix 16
Table 5 Existing Environment Hazards 20
Table 6 Natural Environment Hazards 21
Table 7 Construction Activity Related Hazards 21

Definitions

AEMO	Australian Energy Market Operator
AEP	Annual Exceedance Probability
BESS	Battery Energy Storage System
BMP	Bushfire Management Plan
CEMP	Construction Environmental Management Plan
CQP	Central Queensland Power
DA	Development Application
Development Scheme	*Callide Infrastructure Corridor State Development Area Development Scheme (September 2012)*
GRC	Gladstone Regional Council
Harm	Physical injury or damage to the health of people, damage to property or the environment.
Hazard	A source of potential harm or an existing situation with a potential to cause loss, harm to people or damage to property and environment. (*ISO Guide 73:2009 Risk Management-Vocabulary*)
EHHSA	Environmental Hazards, Health and Safety Assessment
EMF	Electromagnetic Field
EMI	Electromagnetic Interference
LGA	Local Government Area
NEM	National Electricity Market
OCG	Office of the Coordinator General
OEMP	Operational Environmental Management Plan
OHTL	Overhead Transmission Line
Planning Scheme	*Gladstone Regional Council Planning Scheme 2015 (Version 2.1)*
Proponent	The Proponent is Wooderson Solar Development Co Pty Ltd a wholly owned subsidiary of Central Queensland Power Development Co Pty Ltd (CQP), which is a joint venture between RES Australia Pty Ltd (RES) and Energy Estate (CQP) Holdings Pty Ltd as trustee for Energy Estate (CQP) Holdings Trust (Energy Estate).
Project Area	The Project infrastructure and vehicular access will be situated within the bounds of the 'Project Area' which comprises of freehold allotments, Dawson Highway Road Reserve, Duck Holes Road Reserve and two unnamed road reserves. The Project Area has a total area of 2675.91 hectares (ha).
Project Disturbance Footprint	The Project Disturbance Footprint is estimated to be 209.619 ha, is defined as including permanent and temporary components for construction: Permanent components include the following: • Approximately 11 km of 275 kV OHTL, contained within a 60 m wide easement.

	• Approximately 45 monopoles, contained within the 60 m wide easement. • New switchyard (either Option A or Option B). • Access tracks located within the 60 m wide easement that will be used for ongoing maintenance. • Access tracks (where located outside the easement) that will be used for ongoing maintenance. • Vegetation clearing. • Security fencing. Temporary components include the following: • Option A and Option B switchyard construction compound area. • Option A and Option B switchyard temporary laydown area. • Vegetation clearing. The Project Disturbance Footprint includes a buffer around the proposed infrastructure to allow for design refinement during detailed design. The Project Disturbance Footprint is shown in Figure 1.
RES	RES Australia Pty Ltd.
Risks	The chance of something happening that will have an impact on objectives. A risk is often specified in terms of an event or circumstance and the consequences that may flow from it. Risk is measured in terms of a combination of the consequence of an event and its likelihood. (*ISO Guide 73:2009 Risk Management-Vocabulary*)
SARA	State Assessment and Referral Agency
SFAIRP	So Far As Is Reasonably Practicable. As defined by the WHS Act (WHS Act), reasonably practicable means that which is, or was at a particular time, reasonably able to be done in relation to ensuring health and safety, taking into account and weighing up all relevant matters including: • the likelihood of the hazard or risk concerned occurring; • the degree of harm that might result from the hazard or the risk; • what the person concerned knows, or ought reasonably to know, about: • the hazard or the risk; • ways of eliminating or minimising the risk; • the availability and suitability of ways to eliminate or minimise the risk; and • after assessing the extent of the risk and the available ways of eliminating or minimising the risk, the cost associated with available ways of eliminating or minimising the risk, and whether the cost is grossly disproportionate to the risk.
WHS Act	*Work Health and Safety Act 2011 (QLD)*

Executive Summary

The proposed Wooderson Solar Farm is located approximately 40 kilometres (km) south-west of Gladstone in Central Queensland, within the Gladstone Regional Council (GRC) Local Government Area (LGA). The Proponent is Wooderson Solar Development Co Pty Ltd a wholly owned subsidiary of Central Queensland Power Development Co Pty Ltd (CQP), which is a joint venture between RES Australia Pty Ltd (RES) and Energy Estate (CQP) Holdings Pty Ltd as trustee for Energy Estate (CQP) Holdings Trust (Energy Estate). The solar farm is proposed to have a generating capacity of up to 450-megawatts (MW) with a 450 MW direct current (DC) coupled battery energy storage system (BESS) with storage capacity of up to 3,600 megawatt-hours (MWh). This will be connected to the National Electricity Market (NEM) through new overhead transmission lines and will also include construction of associated infrastructure including access tracks, fencing and operations / maintenance facilities.

The solar farm, BESS and associated infrastructure will be assessed in a Development Application (DA) by the State Assessment and Referral Agency (SARA), identified as Development Application 1 (DA1) and does not form part of this assessment.

The works outlined in this assessment includes connection to the NEM through a 275 kilovolt (kV) overhead transmission line (OHTL), switchyard and associated ancillary infrastructure for these elements only (the Project). A total of approximately 11 km of OHTL supported by approximately 45 monopoles is proposed from the solar farm substation (assessed in DA1) to the new switchyard for connection to Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project.

The Project extends over 7 allotments (refer Figure 1), within the GRC LGA, 7 (part Lot 1 on RP616641) of which are subject to assessment under the *Gladstone Regional Council Planning Scheme 2015 (Version 2.1)* (Planning Scheme) and one allotment (part Lot 1 on RP616641) requiring assessment under the *Callide Infrastructure Corridor State Development Area* (SDA) subject to the *Callide Infrastructure Corridor State Development Area Development Scheme (September 2012)* (Development Scheme).

As the Project Disturbance Footprint extends across 2 planning instruments (refer Figure 2), the assessment provided within this report will support two separate DAs:

- Development Application 2 (DA2) – Transmission Corridor and Switchyard within the GRC LGA to be assessed by GRC with referral to concurrence and advice agencies.
- Development Application 3 (DA3) – Transmission Corridor within the Callide Infrastructure Corridor SDA to be assessed by the Office of the Coordinator General (OCG).

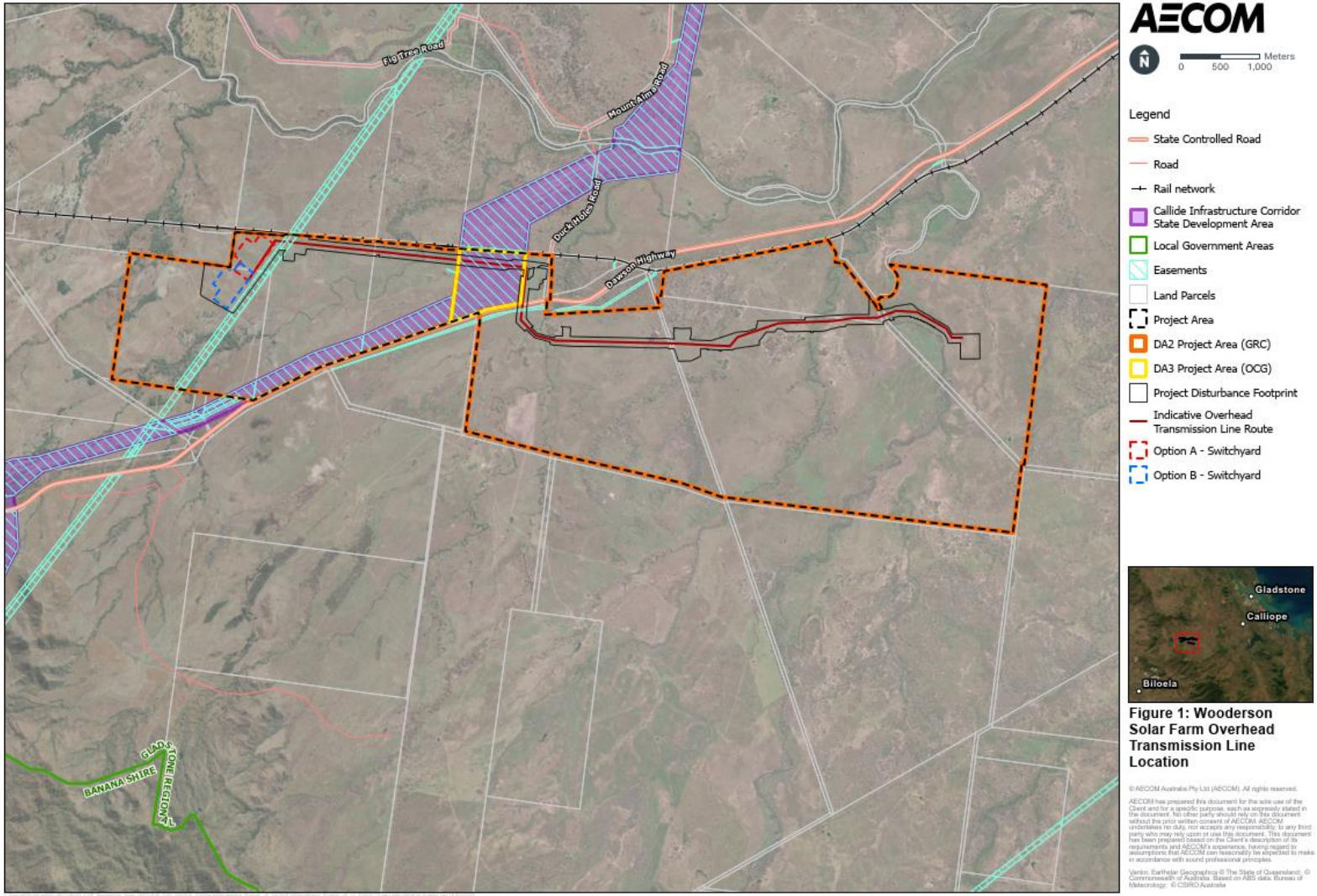


Figure 1: Wooderson Solar Farm Overhead Transmission Line Location

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Figure 1 Wooderson Solar Farm Overhead Transmission Line Location

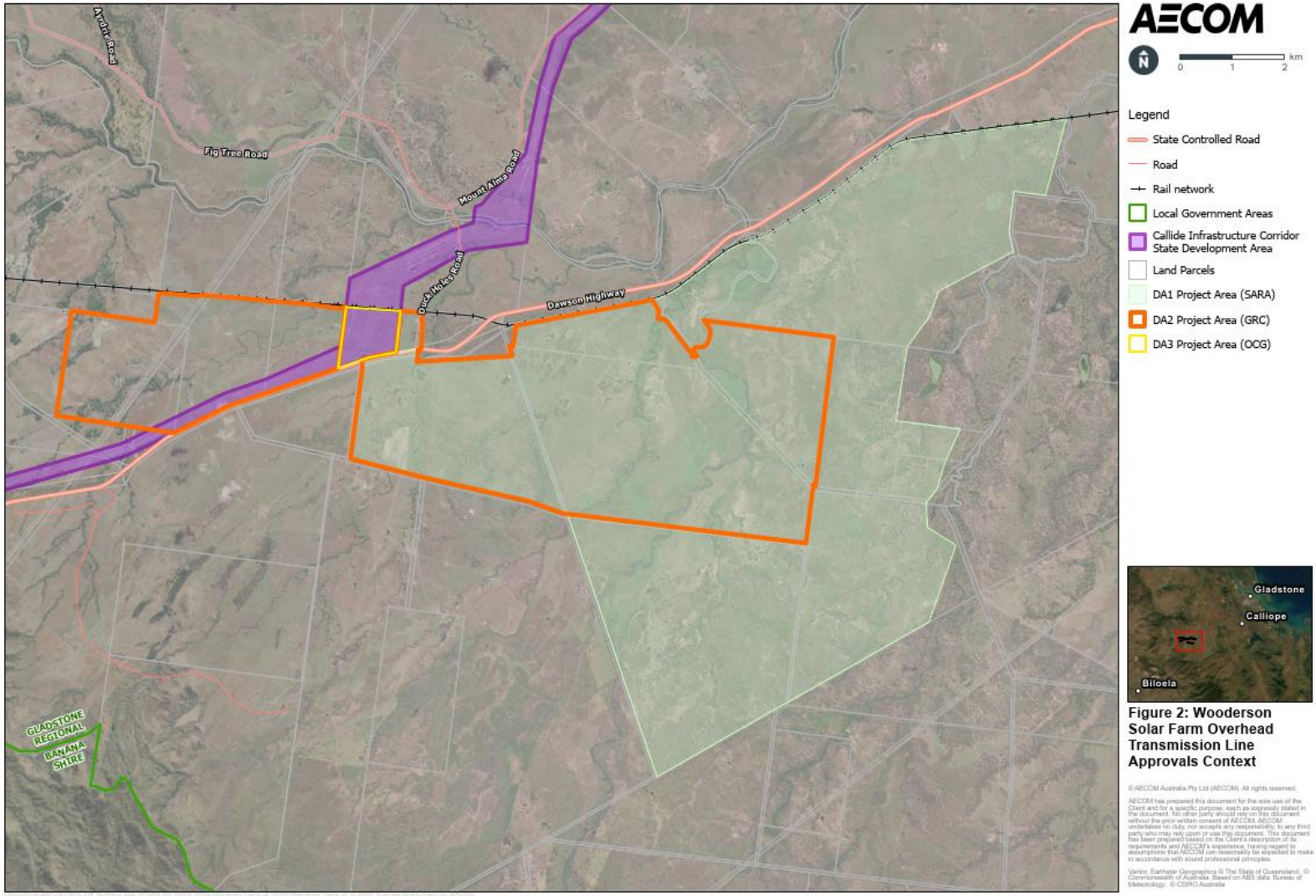


Figure 2: Wooderson Solar Farm Overhead Transmission Line Approvals Context

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Figure 2 Wooderson Solar Farm Overhead Transmission Line Approvals Context

This assessment reviewed hazards related to:

- Existing built environment: underground gas pipelines, roads, rail corridors, and transmission lines.
- Natural environment: bushfires, flooding, and cyclones.
- Construction activities: vehicle movement, waste management, hazardous substances, hot works, and site security.

Multiple risks were identified and documented in the risk register. Each risk was assessed for inherent and residual risk using a structured risk matrix, and mitigation strategies were proposed to reduce all risks to acceptable levels. Key recommendations include:

- Early engagement with stakeholders such as Powerlink, Santos GLNG Pty Ltd, Australia Pacific LNG Gladstone Pipeline Limited, APA WGP Pty Ltd, Jemena Queensland, Queensland Rail (QR), and local authorities.
- Implementation of robust safety management systems for construction and operation.
- Compliance with relevant Australian Standards and statutory requirements.
- Development of mitigation plans and emergency response plans for bushfire, flood, and cyclone scenarios.

The EHHSA concluded that the proposed design can be constructed and operated safely and complies with the Planning Scheme and Development Scheme Assessment Benchmarks provided that recommended mitigation measures and established construction management practices are implemented. Continuous monitoring and stakeholder communication will be essential throughout the Project lifecycle to manage emergent risks effectively.

1.0 Overview

1.1 Project Description

The proposed Wooderson Solar Farm is located approximately 40 kilometres (km) south-west of Gladstone in Central Queensland, within the Gladstone Regional Council (GRC) Local Government Area (LGA). The Proponent is Wooderson Solar Development Co Pty Ltd a wholly owned subsidiary of Central Queensland Power Development Co Pty Ltd (CQP), which is a joint venture between RES Australia Pty Ltd (RES) and Energy Estate (CQP) Holdings Pty Ltd as trustee for Energy Estate (CQP) Holdings Trust (Energy Estate).

The solar farm is proposed to have a generating capacity of up to 450-megawatts (MW) with a 450 MW direct current (DC) coupled battery energy storage system (BESS) with storage capacity of up to 3,600 megawatt-hours (MWh). This will be connected to the National Electricity Market (NEM) through a new overhead transmission line, it will also include construction of associated infrastructure including access tracks, fencing and operations and maintenance facilities.

The solar farm, BESS and associated infrastructure will be assessed in a Development Application (DA) by the State Assessment and Referral Agency (SARA), identified as Development Application 1 (DA1) and does not form part of this assessment.

The works outlined in this assessment include connection to the NEM through a 275 kilovolt (kV) overhead transmission line (OHTL), switchyard and associated ancillary infrastructure for these elements only (the Project). A total of approximately 11 km of OHTL supported by approximately 45 monopoles is proposed from the solar farm substation (assessed in DA1) to the new switchyard for connection to Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project.

The Project extends over 7 allotments (refer Figure 1), within the GRC LGA, 7 of which (including part Lot 1 on RP616641) are subject to assessment under the *Gladstone Regional Council Planning Scheme 2015 (Version 2.1)* (Planning Scheme) and one allotment (part Lot 1 on RP616641) requiring assessment under the *Callide Infrastructure Corridor State Development Area* (SDA) subject to the *Callide Infrastructure Corridor State Development Area Development Scheme (September 2012)* (Development Scheme).

As the OHTL extends across 2 planning instruments (refer Figure 2), the assessment provided within this report will support two separate DAs:

- Development Application 2 (DA2) – Transmission Corridor and Switchyard within the GRC LGA to be assessed by GRC with referral to concurrence and advice agencies.
- Development Application 3 (DA3) – Transmission Corridor within the Callide Infrastructure Corridor SDA to be assessed by the Office of the Coordinator General (OCG).

1.2 Project Overview

The Project is for the purposes of connecting the solar farm and BESS to the NEM and comprises of the following components:

- Approximately 11 km of 275 kV OHTL, contained within a 60 metre (m) wide easement, discussed further in section 1.2.3.
- New switchyard for connection to Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project, discussed further in section 1.2.4.
- Access tracks, discussed further in section 1.2.5.
- Temporary laydown and construction compound areas, discussed further in section 1.3.5.

For the purposes of this application, the following has been used to define the Project to delineate between permanent impact areas and temporary impact areas and are defined as follows (refer Figure 3 and Figure 4):

1.2.1 Project Area

The Project infrastructure and vehicular access will be situated within the bounds of the 'Project Area' which comprises of freehold allotments, Dawson Highway Road Reserve, Duck Holes Road Reserve and two unnamed road reserves. The Project Area has a total area of 2675.91 hectares (ha).

1.2.2 Project Disturbance Footprint

The Project Disturbance Footprint (estimated to be 209.619 ha) is defined as including permanent and temporary components for construction:

Permanent components include the following:

- Approximately 11 km of 275 kV OHTL, contained within a 60 m wide easement.
- Approximately 45 monopoles, contained within the 60 m wide easement.
- New switchyard (either Option A or Option B).
- Access tracks located within the 60 m wide easement that will be used for ongoing maintenance.
- Access tracks (where located outside the easement) that will be used for ongoing maintenance.
- Vegetation clearing.
- Security fencing.

Temporary components include the following:

- Option A and Option B switchyard construction compound area.
- Option A and Option B switchyard temporary laydown area.
- Vegetation clearing.

The Project Disturbance Footprint includes a buffer around the proposed infrastructure to allow for design refinement during detailed design.

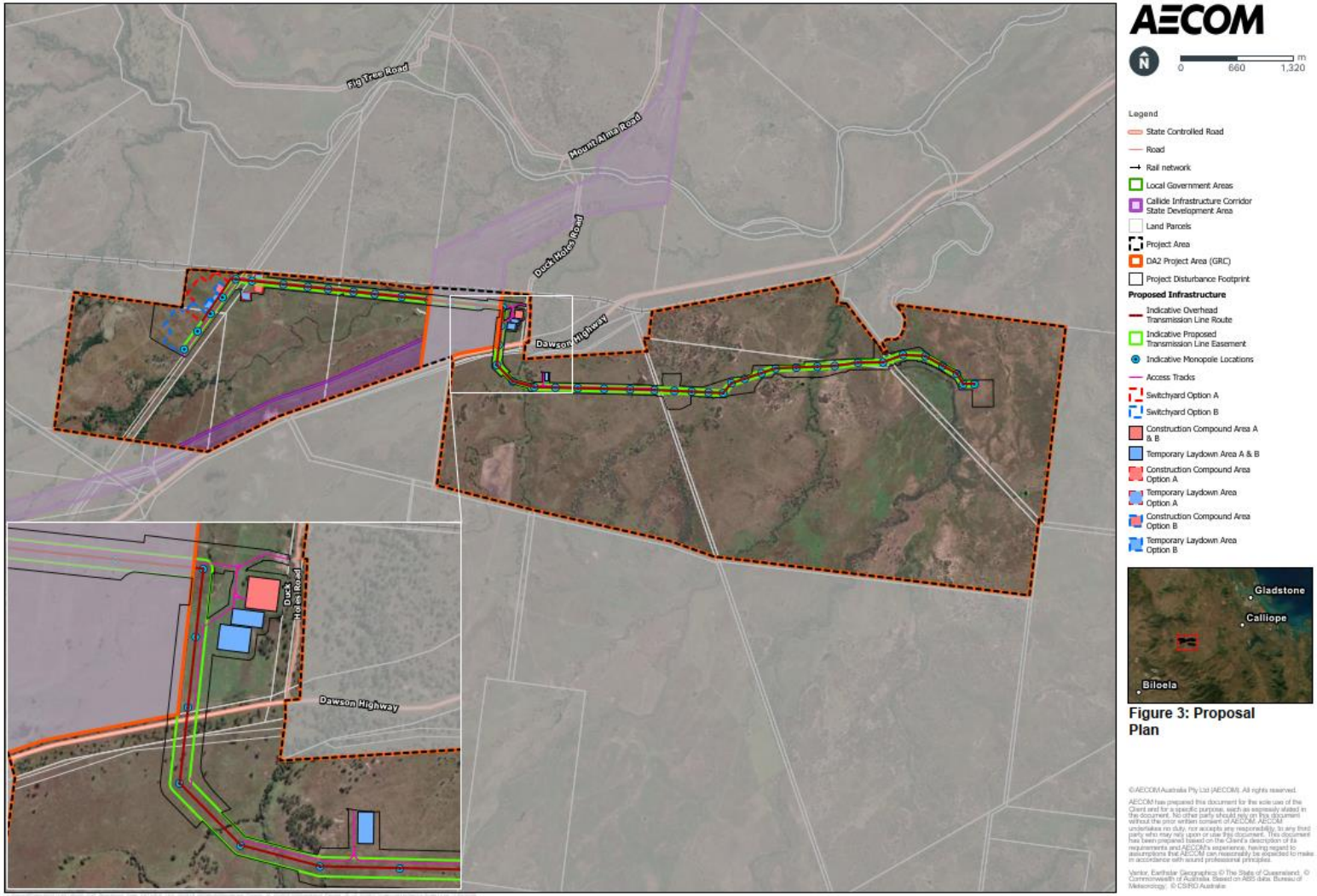


Figure 3: Proposal Plan

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Figure 3 Proposal Plans – DA2

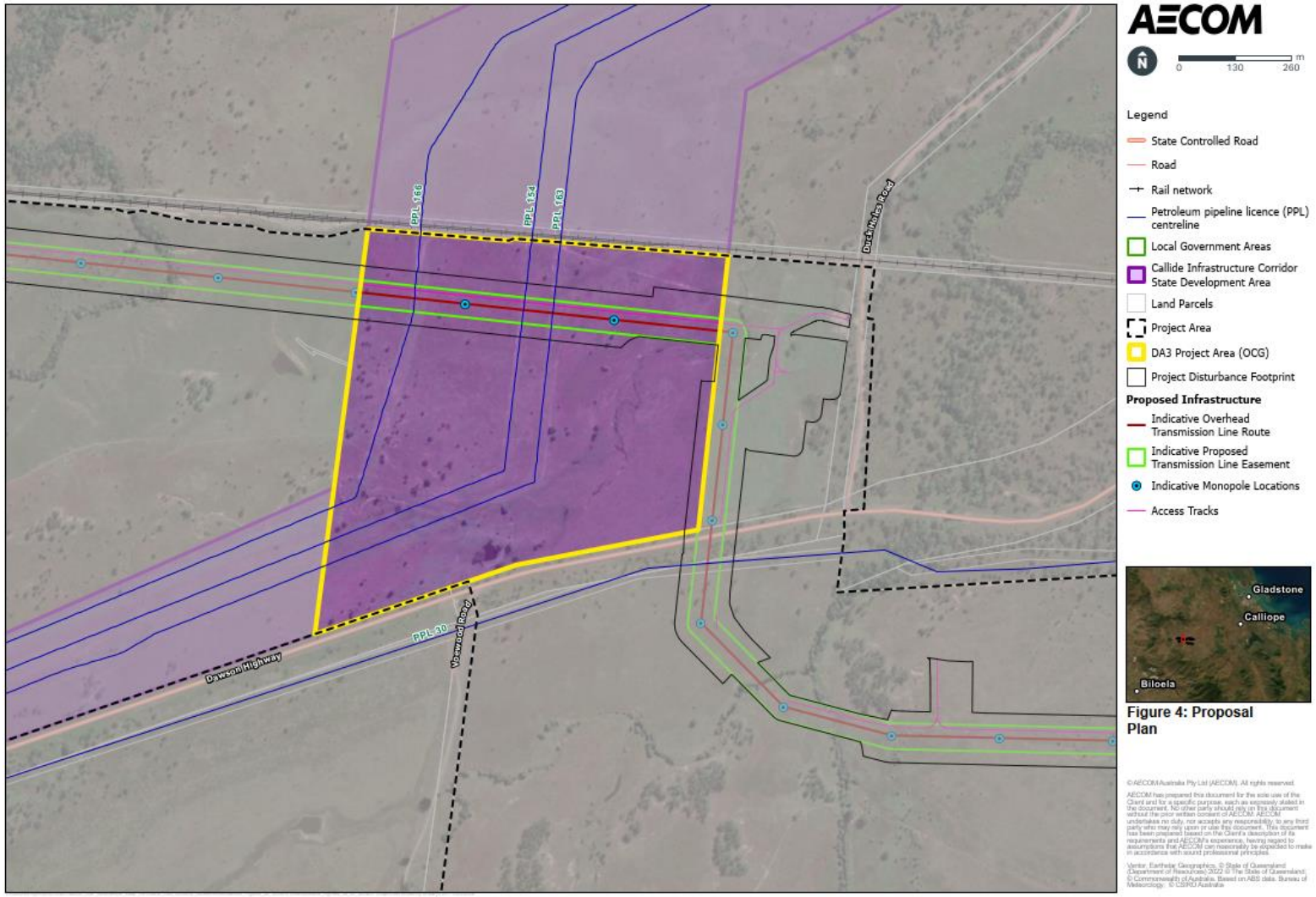


Figure 4: Proposal Plan

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Figure 4 Proposal Plan – DA3

1.2.3 Overhead Transmission Line

The proposed OHTL extends approximately 11 km from the solar farm substation, traverses west to the proposed new switchyard and connects into the Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project.

The OHTL will be contained within a 60 m wide easement (refer Figure 3 and Figure 4). The OHTL will be located with the jurisdiction of the Planning Scheme and Development Scheme (refer Figure 2). The following delineates between the infrastructure and works located each jurisdiction:

The OHTL within the Planning Scheme jurisdiction will:

- Traverse 7 freehold allotments.
- Comprise approximately 10 km of OHTL.
- Be partly within and adjoining Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project and existing Calvale to Wurdong 275kV Transmission Line, where the OHTL will under cross the existing and proposed transmission lines.
- Travel adjacent to Option A and Option B switchyard, construction compound and construction laydown area, which also adjoins Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project.
- Require approximately 43 monopoles with a maximum height of 50 m. The monopoles will be constructed of either steel or concrete. Monopoles will have a foundation radius of approximately 15 m, with some monopoles (particularly corner monopoles) requiring stays. The final requirements for stays will be confirmed during detailed design. Refer to Figure 5, Figure 6 and Figure 7 depicting indicative monopoles and Figure 3 for indicative monopole locations.
- It is noted that these are indicative locations only and will be subject to refinement during detailed design which will take into account impact assessment findings and approval requirements.

The OHTL within the Development Scheme jurisdiction will:

- Traverse 1 freehold allotment.
- Include approximately 840 m of OHTL.
- Traverse an easement containing gas pipelines and located within the Development Scheme.
- Require up to 2 monopoles with a maximum height of 50 m. The monopoles will be constructed of either steel or concrete. Monopoles will have a foundation radius of appropriately 15 m, some monopoles particularly corner monopoles requiring stays. The foundations of a third monopole may partially be located within the Development Scheme jurisdiction, with the centre of the pole located immediately west of the Development Scheme jurisdiction. Refer to Figures Figure 5, Figure 6 and Figure 7 depicting indicative monopoles and Figure 4 for indicative monopole locations.



Figure 5 Example 275 kV OHTL under construction (Cowell Electric, 2025)



Figure 6 Example 275 KV OHTL (Australian Power Industry Partners, 2025)



Figure 7 275 kV Example OHTL with access track (Cowell Electric, 2025)

1.2.4 Switchyard

A new switchyard is proposed to be located at the western end of the OHTL for cut-in connection to Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project (Figure 3). The final location of this switchyard is awaiting confirmation from Powerlink, with two potential locations assessed for the purposes of this application being Option A (red) and Option B (blue) (Figure 3). Both options are proposed to be included within the Project Disturbance Footprint to allow for flexibility in the final location and allow for continued discussions with Powerlink.

The switchyard will include a cleared level platform of approximately 170 m by 80 m for connection of Wooderson Solar Farm, subject to confirmation with Powerlink. There will also be space for potential future expansion contained within a security fence. It will include switchgear to isolate circuits in an emergency, as well as devices to monitor and communicate the performance or circuits.

The Project Disturbance Footprint includes the maximum possible area required for the switchyard.

The switchyard will ultimately be transferred to the ownership of Powerlink, the Transmission Network Service Provider. This is anticipated to occur upon commissioning of the switchyard, however the timing is subject to confirmation with Powerlink. An example of a Powerlink switchyard shown in Figure 8 below.



Figure 8 Example Powerlink switchyard (Cowell Electric, 2025)

1.2.5 Site Access and Internal Access Tracks

A proposed new direct access from the Dawson Highway is not proposed as part of DA2 and DA3, however direct assess has been proposed as part of DA1.

DA2 will utilise the proposed new access from the Dawson Highway and will provide construction and maintenance access to the southern Project Area.

To limit disturbance, internal access within the southern section of the Project Area will use the approved access tracks as part of DA1, with the exception of some additional sections that will provide specific access to the OHTL. These additional access tracks will be up to 7 m wide in accordance with Powerlink access track specifications and are shown on Figure 3 and Figure 4.

Access to the Project Area to the north of the Dawson Highway will be via Duck Holes Road and predominantly within the 60 m wide easement. These access tracks will also be up to 7 m wide in accordance with Powerlink access track specifications. Some sections are located outside the easement to provide access to switchyard Option A and Option B Construction Compound Area and switchyard Option A and Option B Temporary Laydown Area.

Access to the switchyard will be via Duck Holes Road and either via the same track within the OHTL easement, or via a second track immediately adjacent to the OHTL easement. This will be confirmed with Powerlink during detailed design.

Access tracks may cross waterways or watercourses within the Project Area. Where required, culverts will be installed. Where achievable, these will be designed in accordance with the Accepted Development Requirements for operational work that is constructing and raising Waterway Barrier Works (dated September 2025 or as amended) or form part of secondary approvals during detailed design.

1.3 Construction

1.3.1 Timeframes

Construction of the OHTL and switchyard is estimated to take approximately 15 months. It is anticipated that these activities will commence at the same time and indicatively anticipated to commence in March 2029.

Construction timeframes will be dependent on securing Project approvals, timing and staging of construction of other assets including the solar farm and Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project.

Note that these timeframes are based on construction of the assets only. The OHTL will only commence export of electricity during commissioning of the solar farm.

1.3.2 Workforce and Construction Hours

Preliminary estimates of the construction workforce required for the Project will be up to 80 full time equivalent (FTE), comprising up to approximately 50 FTE for the switchyard and 30 FTE for the OHTL.

Construction activities will generally be limited to daylight hours and will vary depending on the season. However, it is expected that most works will occur during standard construction hours of 7 am to 6 pm, Monday to Saturday.

During certain construction activities, works may be required to be undertaken outside of standard hours (i.e. Sunday or night-time periods). In these instances, appropriate mitigation and management measures will be incorporated into the Construction Environmental Management Plan (CEMP). The CEMP will serve as an overarching management plan that will manage and monitor impacts during construction.

1.3.3 Field Activities

The list below provides a standard approach to the progression of construction activities that will occur for the Project:

- Site set out.
- Pre-clearing survey.
- Road and rail approvals.
- Site establishment (construction compounds, laydown areas, equipment and materials).
- Installation of fencing, gates, grides and clean down bays.
- Earthworks for access tracks and hardstand areas.
- Vegetation clearing.
- Monopole site benching.
- Foundation installation.
- Structure assembly and erection.
- Conductor and earth wire stringing.
- Commissioning of all components.

- Reliability testing.
- Rehabilitation of temporary disturbance areas.
- Demobilisation.

Some deviation from the standard approach is anticipated for the sections of Project Disturbance Footprint intersecting gas pipelines. Subject to agreement with the pipeline owner, this may include:

- Temporary protection (i.e. matting, plates, exclusion fencing) over pipelines.
- Access and / or construction controls such as vehicle load limits, vibration restrictions, or controlled access tracks as required.
- Modified stringing set-up, if required, to avoid ground contact or maintain specific clearance over the pipeline.

1.3.4 Site Set Out

Following cadastral survey of the OHTL easement, the location of the OHTL within the easement will be set out. Structure sites will be marked and orientated using design information. Structure locations will be selected based on the technical characteristics of the structures and conductors, topographical constraints, landholder requirements and environmental considerations.

Easement boundaries will be identified, and the Project Disturbance Footprint will be marked prior to vegetation clearing.

1.3.5 Laydown and Construction Compound

Temporary ancillary facilities would be required during construction, and would typically include:

- Construction compounds involving a storage area, offices and meeting room, ablution facilities, canteen and parking.
- Laydown areas involving areas suitable for storing materials, plant and equipment.

While the construction compounds and laydown areas could be located anywhere within the Project Disturbance Footprint, 3 indicative construction compounds and 7 indicative laydown areas are identified in Figure 3 and Figure 4.

These facilities would be compacted with gravel to allow for all weather access. Once construction is complete, these areas would be revegetated or have infrastructure installed dependent on their location within the Project layout.

1.3.6 Infrastructure Crossings

1.3.6.1 Road and Rail

The Project Disturbance Footprint will traverse 2 unnamed local road corridors and one State-Controlled Road (Dawson Highway). Whilst the Project Disturbance Footprint is located south of the Moura Railway, the Project does not intersect or traverse the railway corridor.

1.3.6.2 Transmission Lines

The Project Disturbance Footprint will be partly within and adjoining Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project and Calvale to Wurdong 275kV Transmission Line, where the OHTL will under cross the existing and proposed transmissions lines.

1.3.6.3 Gas Pipelines

The Project Disturbance Footprint will be partly within a gas pipeline easement within the Development Scheme. The easement contains gas pipelines owned by Santos GLNG Pty Ltd (Petroleum Pipeline Licence [PPL] 66), Australia Pacific LNG Gladstone Pipeline Limited (PPL 163), and APA WGP Pty Ltd (PPL 154).

1.3.7 Plant and Equipment

The plant and equipment required for the construction of the Project would include:

- Earthmoving machinery and equipment for site preparation (such as excavators, compactors, rollers and graders).
- Pile-driving equipment (piling rigs).
- Specialised power line stringing equipment.
- Cable trenching and laying equipment.
- Forklifts and cranes.
- Machinery and equipment for substation and inverter infrastructure establishment.
- Manual tools, including compressed air and electric tools.
- Water trucks for dust suppression.
- Diesel generator/s.
- Heavy vehicles, utility vehicles and light vehicles.

1.3.8 Demobilisation and Rehabilitation

All disturbed areas impacted from construction will be reinstated at the end of construction through the implementation of the CEMP.

1.4 Operation and Maintenance

During operation, normal practice is for maintenance staff to carry out scheduled inspections of the OHTL easement, switchyard and access tracks. Maintenance timing will depend on the risk of vegetation growth and the requirement for emergency repairs.

The Project will be operated in accordance with an Operational Environmental Management Plan (OEMP).

1.5 Decommissioning

At the end of the Wooderson Solar Farm's operational life, it is anticipated to either be upgraded (subject to additional planning approvals, as required) or decommissioned. The decommissioning of the solar farm would result in the OHTL being no longer required and so it will also be decommissioned. It is anticipated that switchyard would remain operational as a Powerlink network asset.

Decommissioning the OHTL will be in agreement with the landholders, and would involve removing infrastructure, returning the Project Area to its pre-existing land use as far as practicable, and easements maybe surrendered to the property owner. Some infrastructure such as access tracks may be retained where agreed with and beneficial to the landowner.

Where feasible and practical all dismantled and decommissioned infrastructure and equipment will be recycled. It is anticipated that more material would be recyclable by the end of the operational life than is currently possible, as recycling industries establish. Structures and equipment that cannot be recycled would be disposed of at an approved waste management facility in accordance with all statutory requirements.

Vehicle movements and personnel requirements during the decommissioning phase are expected to be similar or less than the construction phase.

1.6 Workshop Details

An Environmental Hazards, Health and Safety Assessment (EHHSA) of the concept design was conducted as a group activity in a workshop format on Wednesday 24 September 2025 by Microsoft Teams Video Conference with participants joining from various locations. The workshop commenced at 10:00 am AEST and concluded at 11:30 am AEST.

The EHHSA workshop attendees are listed in Table 1 below.

Table 1 EHHSA Workshop Attendees

Name	Position	Company
Renee Weightman	Project Manager	AECOM
Dev Chandat	Facilitator / Structural Engineer	AECOM
Katherine Jaenke	Deputy Project Manager / Senior Environmental Planner	AECOM
Russell James	Development Project Manager	CQP
Timothy Chan	Environmental Advisor	CQP
Miranda Ward	Intern Structural Engineer	AECOM

2.0 Review Scope and Methodology

This assessment report describes the environmental conditions and values within the Project Area and how hazards associated with the Project and local environment interact at a conceptual level. Potential impacts from hazards are described and mitigation measures are provided to assist in minimising the risk through the construction, commissioning, operation, and decommissioning phases of the Project.

2.1 Scope

This EHHSA report identifies the environmental hazard, health and safety risks associated with the construction, commissioning, operation and decommissioning stages of the Project and addresses potential impacts to the surrounding environment and property to demonstrate compliance with the Planning Scheme and Development Scheme Assessment Benchmarks, as well as the health and safety of the community. This report provides preliminary identification of hazards for the Project, including, but not limited to, the following:

- Identification of potential construction activity related hazards (e.g. accidents, spillages, fire and abnormal events) during construction, commissioning, operation, and decommissioning.
- Identification of potential hazards associated with the natural environment (e.g. cyclone, flooding, bushfire, landslide) and existing environment (existing services, public infrastructure, etc).
- Identification of potential hazards associated with the property and significant assets in the vicinity of the Project Disturbance Footprint (e.g. private and government assets).
- Determination of inherent risk without mitigations.
- Discussion of potential mitigation measures as required per risk type.
- Determination of residual risk with consideration of the mitigating measures proposed.

2.2 Assumptions and Limitations

This EHHSA has been carried out based on the Project design as shared in February of 2026, including research and information from the Project. Further investigation and development of the Project may lead to the identification of additional hazards and associated risks, or changes to the identified risks.

The Project will continuously monitor the identified risks and conduct risk assessments to identify and assess emergent risks throughout the Project lifecycle.

Additional mitigation measures are expected to be developed and documented throughout the Project as required. The impacts of natural hazards on the Project discussed in this report are based on existing and historical natural events.

2.2.1 Construction

The following assumptions were made for the construction phase of the Project:

- Common construction safety risks, which cannot be significantly influenced by design, will be reviewed separately by the Proponent and the selected construction contractor, from which a Construction Safety Management Plan (CSMP) will be developed.
- The Project will be constructed under appropriate construction and quality management systems to minimise the opportunity for error and to ensure change is properly assessed and handled.
- The required surveys and assessments (refer to DA2 and DA3 Planning Assessment Report Appendices) will be completed before construction and inform the design (e.g. Ecological Impact Assessment, Traffic Impact Assessment, Aviation Impact Assessment, Electromagnetic Interference (EMI) Assessment, Flood Assessment and Stormwater Management Plan).
- Construction will only commence once all relevant Development Applications are in place, and all works will be undertaken in accordance with the conditions of those approvals.
- There will be an active Site Safety Management System including relevant emergency response and evacuation plans for all hazards requiring this risk management.

- The construction contractor's Safety Management System and the job-specific Construction Safety Management Plan that it develops will appropriately interface to the Site Safety Management System.
- All construction workers will be appropriately trained to complete works and will be made aware of relevant possible hazards and mitigations.

2.2.2 Commissioning

All assumptions as per the construction phase apply for the commissioning phase, in addition to the following:

- A commissioning plan will be devised by the Proponent alongside the selected contractor to ensure a safe process is in place to carry out commissioning as per industry standards.
- All commissioning activities will be carried out as per the requirements of Australian Energy Market Operator (AEMO) and Powerlink.
- All equipment will be tested and approved for commissioning use prior to the commissioning phase for safe use.

2.2.3 Operation and Maintenance

For the operation and maintenance phase of the Project's lifecycle, the following has been assumed:

- The OHTL will be maintained and monitored under an appropriate Health, Safety & Environment Management System, Maintenance Management System and Asset Integrity Management System, facilitated by the Project's operations or facilities maintenance personnel.
- The switchyard will be a Powerlink asset and will be operated, maintained and managed by Powerlink's framework.
- Operational management plans will be in place to ensure the Project's operations are in line with local regulatory requirements and in line with industry standard practice.

2.2.4 Decommissioning

All assumptions as per the construction phase apply for the decommissioning phase, which would occur under the scenarios described in Section 1.5 in addition to the following:

- A decommissioning plan will be devised by the Proponent alongside the selected contractor to ensure a safe process is in place to carry out works as per industry standards.
- All activities will be carried out as per the requirements of AEMO and Powerlink at the time of decommissioning.
- A separate decommissioning specific risk assessment will be undertaken to mitigate risks present across the site at the time of decommissioning by the Proponent and the selected contractor.

2.2.5 Project Development

The EHHSA is only one part of the overall Project development process and is not a "catch-all" for every possible design or construction error, omission, or improvement opportunity. Accordingly, certain assumptions regarding Project were made, including:

- Professional Standards, i.e., Australian, IEC, ISO, API, ASME, etc will be applied to the extent possible where relevant.
- The Project will be designed under appropriate Design and Quality Management Systems to minimise the opportunity for error and to ensure design changes are properly assessed and handled.
- Design reviews and workshops will be undertaken with the Project's designer to ensure the design brief. Engineering Standards, applicable Codes of Practice and statutory requirements are correctly interpreted and applied.

- Engineering design reviews will be performed separately to ensure correct discipline design i.e. structural, mechanical, electrical, process, etc as well as discipline coordination to achieve an internally consistent design.
- Commissioning of asset will be completed as per industry practice.
- The Project design has been and will continue to be informed by inputs from relevant stakeholders including landowners and gas pipeline asset owners to mitigate the relevant risks associated.

These assumptions and the scope exclusions are necessary to highlight the limitations of the EHHSA methodology to emphasise that EHHSA only examines the design, “as presented”, in the context of foreseeable hazards.

2.3 Exclusions

The following items are outside the scope of this EHHSA report:

- All aspects of the overall Wooderson Solar Farm outside of the Project Disturbance Footprint.
- All risks related to business and commercial exposure.
- Detailed and minor Operations and Maintenance Task Analysis, typically performed as a Job Safety Analysis (JSA).

2.4 Methodology

The EHHSA workshop procedure was applied as shown below:

- The EHHSA workshop was attended by members of the AECOM approvals team and CQP personnel. The workshop was facilitated by a chairperson who is independent of the design team.
- Through the process of EHHSA, potential hazards and risks together with existing or planned safeguards were identified. Where there were no existing or planned safeguards, or the workshop team considered the existing or planned safeguards to be inadequate, recommendations were made, including suggested potential mitigations and controls. These were recorded as mitigations.
- The Project design, as developed at the date of the workshop, was used as the primary scope navigation tool. At the commencement of the workshop, the CQP Development Project Manager explained their expectations regarding the design and the approach to explore and identify all potential significant hazards and risks. Attendees were invited to ask clarifying questions to ensure the expected approaches were understood. The facilitator sequentially went through hazard and risks descriptions and questioned the attendees as to the potential for significant safety risks associated with these hazards.
- Possible mitigation strategies to help remove or reduce the risk were then proposed with inputs from the attendees. Where a significant risk was identified, the details were recorded in the EHHSA workshop register. Mitigations were then brainstormed to effectively control the specific hazards/risks and reduce the unwanted consequences. Information recorded included the risk activity, hazard description, unwanted impacts/consequences, and mitigation strategies. Where stakeholder consultation or the preparation of plans and assessments was required to effectively address risks, this was documented along with relevant details on identified risks and proposed mitigation measures.

The emphasis of the discussion was on the safe construction, commissioning, operation and decommission aspects of the Project. The workshop discussion results were recorded in the risk register including the agreed mitigations. After the workshop, the discussed risks were given risk ratings, one for the inherent risk before mitigation strategies are applied and another for residual risk after mitigation strategies are applied.

The risk scoring was completed after the workshop following the risk matrix shown in Table 4 which draws “consequences” and “probability of” from the framework provided in Table 2 and Table 3 respectively. This risk rating procedure showed that there are some hazards that compromise the safety of the Project with unacceptable risk levels but after consideration of the mitigation strategies all risks were able to be reduced to acceptable levels.

Table 2 Consequence Analysis

Consequence	General Description	Health and Safety	Community/Government/ Reputation/Media	Legal	Relationships (Client, Sub-contractors, etc)	Services/Systems	Environmental Effects
Insignificant	No injuries, low financial loss	No injuries	Minor complaint	Legal action unlikely	Damage easily rectified by Site Personnel	Failure of a service with a known workaround	No lasting effect. Low-level impacts on biological or physical environment. Limited damage to minimal area of low significance
Minor	Minor injuries, not requiring medical treatment, minor financial loss	Minor first aid treatment required only	Public concern restricted to local complaints	Low-level legal matter	Concerted effort required by Project Manager to rectify damage	Minor failure of a service on a regional basis	Minor effects on biological or physical environment. Minor short-medium term damage to small area limited significance
Moderate	First aid treatment, on-site release immediately contained, medium financial loss	Reversible injury requiring hospitalisation	Minor, adverse local public or media attention and complaints	Minor legal issues, non-compliances and breaches of regulation.	Serious issues require Project Director (or equivalent) involvement	Moderate failure of a service on a regional basis	Moderate effects on biological or physical environment but not affecting ecosystem. Moderate short-medium term widespread impacts (e.g. sediment runoff during heavy rain affecting a nearby creek and requiring minor remediation)
Major	Medical treatment required, on-site release contained with outside assistance, high financial loss	Moderate irreversible injury/ impairment (<30%) to several people or 1 death.	Serious public or media outcry with international coverage.	Serious breach of regulation with investigation or report to authority with prosecution and/or moderate fine possible.	Very critical issues which require the Proponent's Senior Management (or equivalent) intervention	Serious failure of a key service on a regional basis	Serious environment effects with some impairment of ecosystem function (e.g. Displacement of a species). Relatively widespread medium-long term impacts.
Catastrophic	Extensive injuries, off-site release with detrimental effects, major financial loss	Multiple fatalities or significant irreversible injuries to > 10 people.	International media condemnation.	Very significant fines and prosecutions. Multiple litigation actions.	Irreparable damage that necessitates the Proponent's Directors (or equivalent) involvement	Serious failure of a key service on a regional basis	Significant environmental impact with impairment of ecosystem function. Long-term, widespread effects on significant environment (e.g. an OHTL failure igniting a large-scale bushfire resulting in long-term ecosystem degradation)

Table 3 Probability Analysis

Likelihood	Description
Probable	Could occur repeatedly during the Project life
Likely	Could easily occur and has occurred on a previous project more than once
Possible	Could occur and has occurred on other projects
Unlikely	Not expected to occur but is possible
Rare	Highly unlikely to occur and not foreseeable.

Table 4 Risk Matrix

Consequence / Likelihood	Insignificant	Minor	Moderate	Major	Catastrophic
Probable	M	M	H	H	H
Likely	L	M	M	H	H
Possible	L	L	M	H	H
Unlikely	L	L	M	M	H
Rare	L	L	L	M	M

L - Low Risk
M - Medium Risk
H - High Risk

2.5 Division of Scope for EHHSA

The Project was considered in its entirety during the EHHSA process with hazards defined under the following categories:

- Project Management.
- Stakeholder Management.
- Health and Safety.
- Staff Resources.
- Environmental.
- Approvals.

3.0 Project Risk Identification

The potential hazards associated with the Project infrastructure have been identified using the available information. The risk identification phase identified hazards and their potential receptors during the construction, commissioning, operation, and decommissioning phases of the Project. Receptors are not restricted to individuals, communities or property, and include sensitive environments such as land, water, flora and fauna. The primary hazards have been discussed within this section with greater discussion around their risks captured within Table 5, Table 6 and Table 7.

The EHHSA is not limited to the items discussed within this section of the report.

3.1 Existing Built Environment Hazards

3.1.1 Existing Public Infrastructure

The Project interacts with several categories of public infrastructure along the Project Disturbance Footprint (as shown within Figure 3 and Figure 4), resulting in different types of risks.

3.1.2 Existing Private Infrastructure

The Project directly interacts with gas pipelines within the Project Disturbance Footprint owned by Santos GLNG Pty Ltd (Petroleum Pipeline Licence [PPL] 66), Australia Pacific LNG Gladstone Pipeline Limited (PPL 163), APA WGP Pty Ltd (PPL 154), and located in the Project Area, Jemena Queensland Gas Pipeline (PPL 30). The gas pipelines are critical for the local LNG production which is crucial to the economy at a state and national level. Without implementation of appropriate mitigation measures, the pipelines could be impacted in a variety of ways by the Project which could lead to harmful effects.

Construction activities including excavation, grading and establishment of access tracks, pole foundation installation and movement of heavy vehicles will occur within or adjacent to these pipelines as shown in Figure 4. This creates potential for accidental physical interaction with buried assets, such as:

- Direct strike.
- Ground disturbance.
- Excessive loading within easement.
- Vibration impacts from machinery.

In addition to physical interaction, the Project introduces possible earthing, electrical and electromagnetic interactions between the proposed 275 kV OHTL and the pipelines. Resulting in the following hazards:

- High voltage within the OHTL inducing electrical currents which can influence the effectiveness of the gas pipeline's cathodic protection system if adequate separation and grounding measure are not incorporated.
- Transfer of energy from a lightning strike which can potentially be transferred through the grounding system, which can cause damage to the grounding system.
- Fault current effects in the event of a line-to-ground fault where large fault currents may flow through Earth causing potential rise in the pipeline and posing a risk of electric shock.
- Long term electromagnetic heating from OHTL can also occur which can contribute to coating deterioration and localised corrosion.
- Overall interaction between the pipeline Cathodic Protection and the OHTL grounding system has the potential of causing two-way system disturbance.

There is also an ignition risk associated with hot works and spark-generating construction activities undertaken near easements. Construction-related ignition sources may exacerbate the consequences of an undetected or pre-existing leak.

These hazards and their associated risks have been discussed in greater detail within Table 5.

3.1.2.1 Roads

The Dawson Highway (managed by the Department of Transport and Main Roads) and local road reserves would be used for access to the Project. While the Project does not modify these roads, construction will require movement of heavy vehicles, cranes and mobile plant, increasing traffic volumes and heavy-vehicle/light-vehicle interaction. These interactions may lead to:

- Greater road wear
- Temporary changes in traffic conditions
- Elevated probabilities of traffic incidents.

The risks associated to the above-mentioned hazards on the local road networks have been discussed in greater detail within Table 5.

3.1.2.2 Rail

The OHTL alignment is located south of the Moura Railway Line (managed by Queensland Rail) and does not intersect the rail corridor. Although no direct crossing occurs, construction activities will take place in relative proximity to the rail boundary, particularly near the proposed switchyard locations. This proximity introduces the potential for interaction between construction equipment and locomotive movements. These risks are identified in Table 5 relating to potential locomotive interaction, fire events involving rail cargo and secondary impacts on nearby gas pipelines.

3.1.2.3 Transmission Lines

The key interface with existing transmission lines for the Project will be the undercrossing of the existing Calvale to Wurdong 275 kV line and Powerlink's proposed Calvale to Calliope River 275 kV line. Powerlink is progressing the 87 km double-circuit 275 kV Calvale–Calliope River line that will largely be constructed within existing spare easements. The Project will interact with this future line at the undercrossing near the switchyard and through the cut-in to the line at the switchyard. As a result, the key hazards are:

- Flashover risk if the upper conductor breaks and falls or approaches the lower circuit.
- Simultaneous outage risk due to mechanical failure on the upper line impacting the lower line.
- Induced voltages and electromagnetic interference between circuits, affecting safety and protection systems.
- Arc-over potential even without physical contact if dropped conductors enter the lower line's electrical clearance envelope.
- Maintenance access constraints, requiring outages or additional controls for safe work at the crossing.
- Shared fault exposure during bushfires, smoke events, or lightning, increasing the probability of concurrent faults.
- Regulatory non-compliance risk if minimum phase-to-phase or phase-to-earth clearances are not maintained over time (e.g., sag, tower settlement).

3.2 Natural Environment Hazards

Natural hazards exist as external risk influences on the Project. Key natural hazards identified for the Project Area include bushfire, flooding and cyclones. The risks from natural hazards can be minimised through the recommendations provided in Table 6.

3.2.1 Bushfire

The Project is located within the Project Disturbance Footprint, which is partially mapped as a 'Medium Potential Bushfire Intensity' Bushfire Prone Area under the Planning Scheme. Bushfire therefore represents a relevant natural hazard for the Project during construction and operation.

Bushfire risks will be managed through the implementation of appropriate design and operational controls, as detailed in the Bushfire Management Plan (BMP), which will apply to relevant phases of the Project.

3.2.2 Flooding

The Project is approximately 1.6km from the Calliope River with the Project Disturbance Footprint passing directly over various local creeks (Lost Spring Creek, Maxwelton Creek, Duck Holes Creek, Doubtful Creek and Running Creek). Concept level flood modelling indicates that the Project Area will be impacted by a 1% Annual Exceedance Probability (AEP) flood at the local creeks. At various locations, OHTL monopoles and sections of the access road coincide with flooded sections of the local creeks in a 1% AEP flood.

Flooding presents a hazard to infrastructure through potential erosion around monopole foundations, loss of ground support, reduced bearing capacity, and damage to access tracks. This could affect long-term structural stability and access to maintenance. Flooding also presents a hazard to construction and maintenance personnel, including reduced site accessibility, increased risk of vehicle incidents on inundated or unstable access tracks. These risks are most relevant during the construction phase but may also affect operation and maintenance activities following significant rainfall events. The monopole numbers potentially affected by a 1% AEP flood event have been listed below, refer to Flood Assessment and Stormwater Management Plan (DA2 Planning Assessment Report Appendix K and DA3 Planning Assessment Report Appendix K) for further detail:

- NP 4
- NP 5
- NP 6
- NP 9
- NP 10
- NP 17
- NP 26
- NP 30
- NP 35
- NP 38
- NP 39.

3.2.3 Cyclone

In Queensland, tropical cyclones mostly form from lows within the monsoon trough and affect the northern areas of the state. While relatively uncommon, these systems are generally formed during summer months and affect coastal areas most.

3.2.4 Construction Activity Related Hazards

Construction activities for the Project introduce risks primarily related to vehicle and plant operations, waste management, hazardous substances, hot works, and site security. The hazards have been discussed in further detail within Table 7. These hazards are typical to a construction site and risks from these hazards can be minimised through the mitigation proposed within Section 4.0.

3.3 Summary of Hazard

A summary of major hazards has been listed within Table 5, Table 6 and Table 7.

Table 5 Existing Environment Hazards

Category	Hazard	Risk	Project Phase
Health and Safety / Environment	Existing private gas pipelines: • Damage to gas pipeline through construction activities. • Ignition of pre-existing gas leak through hot works or other sources of ignition. • Physical damage to gas pipelines due OHTL monopole collapse. • Electrical gradient in gas pipeline due to OHTL earthing.	• Direct physical damage to the pipe can cause a significant gas leak to the environment and extreme commercial ramifications of damage to pipeline. • Fire/explosion risk due if leaking gas Ignited. • Electrical shock to pipeline maintenance worker, potentially causing harm to construction personnel and residents.	• Construction • Commissioning • Operation • Decommissioning
Stakeholder Management / Environment	Existing private gas pipelines: • Long-term electromagnetic heating of gas pipeline coating and material. • Current leakage into gas pipeline due to lack of insulation and grounding. • Interaction between the pipeline cathodic protection of gas pipeline and OHTL earthing.	• Deterioration of pipeline coating and material causing early corrosion related failure. If the failure occurs in an unexpected manner, gas leaks could occur.	• Operation
Health and Safety / Stakeholder Management	Existing road: • Increased traffic on Dawson Highway. • Increase in heavy vehicle and light vehicle interactions. • Driver fatigue for construction workers after long shifts. • Changes in traffic conditions.	• Harm to construction personnel and residents. • Greater road wear. • More traffic incidents. • Damage to equipment and property.	• Construction • Commissioning • Decommissioning
Health and Safety / Environment	Existing rail corridor: • Interface between Project vehicles and the railway at the Duck Holes Road level crossing if personnel get lost and miss the entry location to the northern section of the Project Area • Interface between Project and railway communications infrastructure	• Locomotive interaction with personnel causing harm to construction personnel and residents. • Significant fire caused by ignition of rail cargo causing harm to construction personnel and residents. • Property damage. • Secondary impacts from rail incident on gas pipelines.	• Construction
Health and Safety	Existing services: • Interaction with existing transmission lines during the construction of the new 275 kV OHTL.	• Harm to construction personnel and residents.	• Construction • Commissioning • Decommissioning

Table 6 Natural Environment Hazards

Category	Hazard	Risk	Project Phase
Health and Safety / Environment	Bushfires: • Damage to stored equipment and materials due to bushfires. • Damage to the proposed OHTL in operation due to bushfires. • Damage to Switchyard and supporting infrastructure.	• Damage to surrounding infrastructure. • Structural failure of transmission line or loss of services. • Harm to construction personnel and residents. • Loss of property.	• Construction • Commissioning • Operation • Decommissioning
Health and Safety / Environment / Stakeholder Management	Floods: • Damage to proposed OHTL monopole foundations due to flooding. • Damage to access tracks due to flooding. • Inundation of laydown area and stored equipment/materials due to flooding. • Damage to Switchyard and supporting infrastructure.	• Damage to OHTL or loss of service. • Loss of property if laydown yard is flooded. • Delay in repairs and maintenance due to loss of access. • Loss of property.	• Construction • Commissioning • Operation • Decommissioning
Health and Safety / Environment / Stakeholder Management	Cyclone • Damage to the proposed OHTL due to cyclonic activity. • Damage to Switchyard and supporting infrastructure.	• Damage to OHTL. • Harm to construction personnel and residents. • Collapse of powerline causing arc flash. • Loss of property	• Construction • Operation

Table 7 Construction Activity Related Hazards

Category	Hazard	Risk	Project Phase
Health and Safety / Environment	Spread of animal or plant disease through movement of vehicles and mobile plant (e.g., soil-borne pathogens or weed seeds transported via tyres and machinery).	• Potential stock losses, biosecurity impacts, and subsequent commercial ramifications for surrounding agricultural properties. • Loss of vegetation or spread of invasive species. • Changes to irrigation requirements. • Possible health hazards to animals.	• Construction • Commissioning • Operation • Decommissioning

Category	Hazard	Risk	Project Phase
Health and Safety / Environment	Dust generation from unsealed access tracks and construction areas.	• Reduced visibility for workers or road users due to dust. • Respiratory irritation for residents and construction staff due to dust • Nuisance and disturbance to residential.	• Construction • Commissioning • Operation • Decommissioning
Health and Safety / Environment	Noise and vibration from construction machinery and heavy vehicle movements.	• Nuisance and disturbance to residential. • Disruption to livestock.	• Construction • Commissioning • Operation • Decommissioning
Environment	Construction waste and sewage management: • Construction waste (concrete, etc). • Improper storage or handling of sewage leading to accidental release from ablution units.	• Offensive odour. • Impact on visual amenity, e.g. temporary stockpile. • Cross contamination of hazardous materials with general waste polluting soil. • Pollution to watercourses. • Increase nutrients and risk of disease in event of accidental release.	• Construction • Commissioning • Operation • Decommissioning
Health and Safety / Environment	Dangerous goods/Hazardous substance: • Storage • Handling • Transportation.	• Loss of containment. • Pollution to stormwater and soil. • Potential fire from flammable goods. • Health impacts. • Escalate the risk of bushfire.	• Construction
Health and Safety / Environment	Hot work and machinery use.	• Risk of fire or explosion from ignition of flammable contaminants. • Sparks act as catalyst for bushfire, live electricity near bushfire. transmission line can escalate the risk.	• Construction • Commissioning • Operation • Decommissioning
Health and Safety / Environment / Stakeholder Management	Trespassers (for vandalism, theft, etc).	• Compromising infrastructure security. • Contact with live electricity causing harm.	• Operation

4.0 Mitigations

The applicability and timing of each mitigation measure will depend on the Project stage it relates to (construction, commissioning, operation or decommissioning). Each measure will be implemented by the responsible party for that phase, as outlined in the relevant management plans.

Proposed controls will be considered further and finalised during detailed design and through the construction risk assessment process. The controls will be based on existing Project safety management systems.

4.1 Existing Built Environment

4.1.1 Existing Private Infrastructure

Mitigation of the overall risks surrounding the gas pipeline interaction with the proposed OHTL will commence through coordination and governance using the following actions:

- Gas pipeline asset owners and the OCG have been engaged early in the design and construction process to ensure all requirements, constraints and protection measures are understood and incorporated. Engagement with these parties will continue through detailed design, construction and operations.
- Pipeline crossing agreements with each asset owner will be established prior to carrying out any works within or adjacent to their assets.
- Before You Dig Australia enquiries will be lodged and information received will be processed prior to excavations and construction around buried services.
- Access track alignment, vehicle loading limits, and construction methods will be coordinated with pipeline owners to ensure pipeline integrity is maintained.

The Project will undertake the following activities to accurately identify underground assets and integrate essential information provided by asset owners and local authorities into the design:

- Review of historical records, geotechnical investigations, and site inspection records to confirm the exact location, depth, and condition of all buried pipelines.
- Asset owner input and existing data will be incorporated into the detailed design to ensure safe separation distances and construction methodologies are utilised.
- Electromagnetic Interference (EMI) Assessment (refer to DA2 and DA3 Planning Assessment Reports Appendix J) will be incorporated into the design.
- Appropriate clearances and reinforced structures will be used where necessary to prevent physical damage to buried pipelines.
- Grounding and bonding systems will be designed to manage voltage rise, minimise induced voltages, and maintain compliance with relevant standards.

To manage induced voltages and Electromagnetic Field (EMF) interactions between the OHTL and buried pipelines, the Project will further investigate the following controls during detailed design:

- EMF levels will be monitored to ensure compliance with exposure guidelines and confirm that no adverse impacts occur to the gas pipeline cathodic protection system.
- Metallic infrastructure will be grounded to prevent hazardous induced voltages.
- Grounding and bonding systems will be installed to manage voltage rise, reduce corrosion or shock hazards.
- Bonding will be applied between the OHTL grounding system and the pipeline in high-risk areas, subject to asset-owner approval.
- Gradient control mats will be installed near pipeline crossings as required to reduce step and touch potentials.

- Grounding systems will be designed to not create elevated ground-potential rise conditions adjacent to the pipeline.

The final controls will be confirmed during detailed design in partnership with gas pipeline asset owners.

During construction and commissioning, the following measures will be implemented to monitor the pipeline to help mitigate the risks for the gas pipelines:

- Surveillance and gas-leak detection measures will be implemented in areas where pipeline impacts could occur as required.
- Weather conditions will be monitored for lightning risk and apply appropriate construction controls during high-risk periods.
- All construction works will comply with relevant codes of practice, including Safe Work Australia guidelines and Powerlink construction standards.
- Where possible, monitoring of voltages induced within the pipelines will be allowed for to monitor the impact of the OHTL on the pipelines.

Finally, to prevent physical damage to the pipe the following mitigation will be implemented:

- Clear signage and exclusion zones will be established around overhead line works and pipeline easements during construction.
- All personnel will be trained in electrical hazard awareness, pipeline safety requirements, and the correct procedures for working near buried gas assets.
- Safe lifting procedures will be implemented, and spotters will be utilised when working near critical underground infrastructure.
- Approved construction work plans will be followed, and all excavations will be reinstated appropriately after any underground assets are exposed.

The above mitigation measures have sought to demonstrate compliance with the Objectives of the Development Scheme. Objectives 1 to 6 are specifically targeted by the proposed mitigations as they aim to minimise the impact of the Project on the existing gas pipeline infrastructure.

Further discussion and assessment against the Objectives has been included in DA3 Planning Assessment Report. Within the Development Scheme, the Project comprises two monopoles and a short section of access track intersecting existing gas pipeline easements. Impacts to private infrastructure are localised and temporary, and are appropriately managed through detailed design controls, asset owner engagement and construction management measures.

4.1.2 Existing Public infrastructure

4.1.2.1 Roads

Vehicles used during construction will include graders, excavators, cranes, water trucks, heavy vehicles and other mobile plant required. Vehicles used during operations and maintenance will typically include light vehicles and utility vehicles accessing the easement and switchyard for inspections and routine maintenance. Personnel operating these vehicles will be trained and authorised. The vehicle-related mitigations apply primarily during the construction phase, with limited ongoing relevance during the operation phase when light-vehicle access for inspections occurs. A Traffic Impact Assessment (TIA) is to be carried out by the Proponent to understand the impacts on the local traffic to implement mitigations as necessary. There is an existing TIA for the surrounding road network which will be considered.

In addition to the mitigations drawn from the TIA, traffic will be controlled by the provision of adequate crossing points, demarcation, signage and speed limits. Positive communication and give way in accordance with the Traffic Management Plan will be undertaken, reducing risk of vehicular interactions. Access to the southern section of the Project Area will be via the Dawson Highway access and internal access tracks (DA1), and Duck Holes Road for the northern section. Access to the switchyard will be via Duck Holes Road and either the OHTL easement track or an adjacent track. As temporary road closures are not anticipated, traffic management will focus on safe two-way access using existing roads and constructed access tracks. This traffic management approach is specific to the

construction phase, as operational use of the access tracks is infrequent and controlled under standard OHTL maintenance procedures.

Furthermore, an assessment of the Project against the Planning Scheme Assessment Benchmarks and State Codes has been included in the DA2 Planning Assessment Report, Appendix N (Traffic Impact Assessment), Appendix O (State Code Assessment) and Appendix P (Planning Scheme Assessment) to demonstrate compliance relating to local and state-controlled roads.

To demonstrate the Projects compliance with Objectives 4 and 6 of the Development Scheme, an assessment against State Code 1: Development in a State Controlled Road Environment has been undertaken and has been included in the DA3 Planning Assessment Report Appendix E (State Code Assessment). This is to ensure that impact on the existing road environment is minimised and the Project is appropriately placed.

4.1.2.2 Rail

Key mitigation measure to reduce the likelihood of interactions with the rail line and locomotives is to ensure that OHTL is built outside of the rail corridor envelope as prescribed by Queensland Rail (QR) which is currently reflected in the design. Constructing the Project outside of the envelope essentially eliminates the risk of all rail associated hazards. However, engagement with QR early within the process will allow for a safe construction methodology to be developed and ensure adherence to mandatory exclusion zones to mitigate risks. The proposed switchyard options are located approximately 500m from the rail corridor and therefore do not introduce additional rail-related risks. Ongoing engagement with QR will continue through the development application and design development process for continual engagement and collaboration. These measures relate to the construction and commissioning phases, as no rail-adjacent work is required during operation.

To demonstrate the Projects compliance with Objectives 4 and 6 from the Development Scheme, an assessment against State Code 2: Development in a Railway Environment has been undertaken and has been included in the DA3 Planning Assessment Report Appendix E (State Code Assessment). This is to ensure that impact on the existing rail environment is minimised and the Project is appropriately placed.

There are no specific Planning Scheme Assessment Benchmarks relating to development in a railway environment, however, an assessment against State Code 2: Development in a Railway Environment has been undertaken and included in DA2 Planning Assessment Report Appendix O (State Code Assessment).

4.1.2.3 Transmission Lines

Mitigating measures to allow safe construction and operation methodologies around the existing Calvale to Wurdong 275 kV line and Powerlink's proposed Calvale to Calliope River 275 kV line include:

- Early engagement with Powerlink to satisfy the requirements of the *Electrical Safety Act 2002* and subordinate legislature, including adherence to Powerlink's Electrical Safety Rules (ESR) and Safe Access to High Voltage Electrical Apparatus (SAHVEA).
- Allowing for appropriate vertical separation by adjusting tower heights or adding dedicated crossing structures to ensure compliance with clearance requirements under worst-case sag and swing conditions.
- Design for conductor drop envelopes, ensuring the lower line remains outside the upper line's potential fall and arc-over zone.
- Lightning protection measures to reduce lightning-induced failures and minimise transferred surges to the lower circuit.
- Optimise thermal ratings and sag profiles through appropriate conductor selection, tensioning, and structural configuration to maintain adequate clearances during high-temperature operation.
- Apply electromagnetic induction mitigation, such as bonding, earthing, or shielding, where systems could be affected.
- Develop coordinated maintenance and switching procedures, ensuring either line can be safely de-energised or protected during works near the crossing.

- Enhance inspection and condition monitoring, including drones, helicopters, or LiDAR, to verify clearances and detect early signs of mechanical degradation.
- Implement bushfire and environmental risk controls, such as improved vegetation management, fire-resistant components, and emergency response coordination.
- Ensure compliance with local statutory and utility design standards, validating clearances, electrical withstand distances, and structural reliability at design and throughout asset life.
- Design, construction, and operation of the OHTL and switchyard in accordance with Powerlink guidelines.

These mitigation measures apply during the construction, commissioning and decommissioning (OHTL only) phases when works occur in proximity to live transmission assets, with no direct operational interface expected once the Project is commissioned.

4.2 Natural Environment

The Project Disturbance Footprint traverses' potential bushfire, cyclone and landslide prone regions. The design and implementation of the Project will consider the impacts of potential natural hazards and will manage these hazards to minimise impact to the health, safety and environment to so far as is reasonably practicable (SFAIRP). The environmental values that have the potential to be impacted throughout the Project lifecycle will be managed in accordance with the Project's Standard Environmental Controls Specification and relevant Australian Standards to ensure compliance with the legislative requirements, such as the *Environmental Protection Act 1994 (EP Act)*.

Within the Development Scheme, potential environmental impacts are confined to a small footprint associated with two monopoles and an access track. Given the limited scale of works, natural hazard risks are localised and are managed through standard design, construction and operational controls.

4.2.1 Bushfire

As a mitigation measure, the Project has prepared a BMP as per industry standard which will be applied throughout the Project lifecycle for the Project. The BMP includes guidelines for the following within the Project Disturbance Footprint:

- Ground patrols to assess vegetation clearance and the condition of transmission lines and access tracks.
- Vegetation management through Asset Protection Zones and Easements
- Weather monitoring
- Accessibility to firefighting water
- Access requirements for first response teams and heavy attack fire fighting vehicles.

Furthermore, an assessment of the Project against the Bushfire Hazard Code of the Planning Scheme has been included in the DA2 Planning Assessment Report Appendix Q (Bushfire Management Plan) to demonstrate compliance with the Planning Schemes Assessment Benchmarks relating to bushfire.

Although there are no specific bushfire performance criteria within the Development Scheme, the BMP has focused on how the Project will achieve compliance with Objective 6 of the Development Scheme. An assessment of this Objective has been included in DA3 Planning Assessment Report Appendix O (Bushfire Management Plan).

4.2.2 Flood and Cyclones

Conceptual design of the OHTL shows some poles as well as sections of the access track located within the 1% AEP flood zones for the local creeks. A Flood Assessment and Stormwater Management Plan (refer DA2 and DA3 Planning Assessment Report Appendix K) has been compiled to gain an understanding of the impact of flooding on the Project's infrastructure.

Flood risk mitigation will occur during the detailed design phase, including consideration of pole foundation siting to avoid concentrated overland flow areas where practicable. Access tracks will be

aligned and constructed to avoid impeding surface water flow velocities and volumes as far as reasonably practicable. All structures will be designed in accordance with relevant local standards.

Risks to the Project arising from cyclone activities can are predominantly associated to high winds and storm water surge. Designing to the local standards and the available historic data to accommodate for significant cyclonic events will allow the OHTL and switchyard to be resilient through the harsh weather conditions of the local area.

Furthermore, an assessment of the Project against the Rural Zone Code, Development Design Code and Flood Hazard Overlay Code of the Planning Scheme has been included in the DA2 Planning Assessment Report Appendix K (Flood and Stormwater Assessment) to demonstrate compliance with the Planning Schemes Assessment Benchmarks relating to flooding.

Although there are no flood specific performance criteria in the Development Scheme, the assessment has focused on how the Project will achieve compliance with Objective 6, 7 and 8 of Development Scheme and has been included in DA3 Planning Assessment Report Appendix K (Flood and Stormwater Assessment).

4.3 Construction Activity Related Hazards

4.3.1 Vehicle and Plant Equipment

Construction vehicles and plant will operate under the Project's Construction Environmental Management Plan (CEMP), which includes measures to minimise noise, vibration and dust in accordance with the *Environmental Protection Act 1994*. Machinery will be maintained so it remains in safe working condition, and equipment will be shut down when not in use to reduce emissions and unnecessary noise.

Fatigue and fitness-for-work requirements will be managed through the CEMP, including drug and alcohol testing, to meet obligations under the *Work Health and Safety Act 2011*. Speed limits will apply on unsealed, off-road access tracks, and vehicles will be fitted with compliant exhaust systems to reduce air emissions.

Dust suppression controls for construction traffic and work areas will be implemented through the CEMP for air quality. Vehicle movements during operations will be limited to periodic inspections, with minimal environmental impact.

4.3.2 Waste

Waste generated during construction including spoil, concrete, conductor drums, steel, vegetation, and general construction waste will be managed under the CEMP for waste management. These wastes will be recycled as much as possible, and all waste will be stored and removed appropriately.

Small quantities of hazardous (regulated) wastes such as hydrocarbons or hydrocarbon contaminated products (oily wastes and oil filters) may be produced, and these wastes will be disposed of by a licensed regulated waste transport contractor. The CEMP for waste storage should be developed in accordance with requirements for the storage, containment, disposal and spill response for potentially hazardous waste materials.

4.3.3 Dangerous Goods and Hazardous Substances

The Project will use fuels (predominantly diesel), lubricants, oils, minor quantities of solvents and acids, degreasers and domestic cleaning agents during construction, operation and decommissioning.

Transport of dangerous goods will only be undertaken by license transporters in accordance with the *Australian Code for the Transport of Dangerous Goods by Road & Rail* (ADG Code), including Hazchem placarding and spill containment requirements.

Hazardous materials will be managed under the Project's CEMP to ensure no contamination of land or water. All chemicals will be stored, handled and used according to provisions in their Safety Data Sheet (SDS) which will be readily accessible on site.

Storage, containment, disposal and spill response for potentially hazardous materials will be managed in accordance with *AS 1940:2017 (Storage and Handling of Flammable and Combustible Liquids)* and

AS 3780:2008 (Storage and Handling of Corrosive Substance). Spill management requirements will include:

- Assess spill (extent and potential to migrate offsite, fire hazard potential, type and volume)
- Isolate the spill (prevent further spillage, blocked drains and prevent access to the area)
- Notification of the spill
- Clean up and remediation
- Restock spill kit.

4.3.4 Hot Works

Activities which involve hot work have the potential to generate fires. The Project will ensure that a risk assessment process is in place in accordance with the Project's BMP to prevent outbreak of fire, including:

- Minimise the need for on-site hot works through prefabrication.
- Adopt low fire risk infrastructure design.
- Develop strategies in planning, investigation and acquisition phase.
- Limit hot work during extreme weather conditions where necessary.
- Availability of first response fire-fighting equipment and trained personnel.
- Timely delivery of operational and maintenance strategies including regular inspections and vegetation maintenance.

5.0 Conclusion and Recommendations

This EHHSA was undertaken to identify and evaluate potential hazards associated with the construction, commissioning, operation, and decommissioning of the Project. The purpose was to ensure that risks to personnel, the community, and the environment are understood early and mitigated through design, planning, and management strategies.

This assessment has confirmed that the proposed Project can be constructed and operated safely and comply with the Planning Scheme and Development Scheme provided that recommended mitigation measures are implemented as discussed within this EHHSA.

While several inherent risks were identified, including existing infrastructure, natural hazards and construction related hazards. All were assessed as manageable through the proposed mitigations. The detailed findings of the EHHSA are documented in the risk register, key recommendations include:

- Early and ongoing stakeholder engagement with Powerlink, Santos GLNG Pty Ltd, Australia Pacific LNG Gladstone Pipeline Limited, APA WGP Pty Ltd, Jemena Queensland Gas Pipeline, QR, OCG, GRC, and other local authorities to ensure safe construction methodologies and compliance with exclusion zones.
- Implementation of comprehensive safety management systems, including Construction Safety Management Plans and emergency response procedures for bushfire, flood, and cyclone scenarios.
- Design compliance with Australian Standards (AS7000, AS/NZS1170 series, AS1940, AS3780) and relevant legislation such as the *Work Health and Safety Act 2011 (QLD)* and *Environmental Protection Act 1994*.
- Continuous monitoring and communication with stakeholders throughout the Project lifecycle to identify emergent risks and maintain alignment with best practice safety protocols.

By applying these recommendations and maintaining proactive risk management, the Project can achieve its objectives while minimising impact on the Project personnel, the community, the environment and local built infrastructure.

Appendix M

Landscape and Visual Impact Assessment



Wooderson Solar Farm Overhead Transmission Line and Switchyard

Landscape and Visual Impact Assessment

26 March 2026

Document Register

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LatStudios acknowledge the Traditional Custodians of the lands and waters where we work, including the Gangulu, Bayali and Gureng Gureng People whom have connection to the LVIA Study Area.

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Table of Contents

Document Register i
Table of Tables iv
Table of Figures v
Glossary vi
Executive Summary 1
1. Introduction 5
1.1. Project description 6
2. Scope of assessment 8
2.1. Approach to the LVIA 8
3. Methodology 10
3.1. Relevant guidelines and standards 10
3.2. Influence of community perception on LVIA methodology 10
3.3. Desktop analysis 11
3.4. Field survey 11
3.5. Identification of potential Project impacts 12
3.6. Landscape impact assessment methodology 12
3.7. Lighting assessment 15
3.1. Visual impact assessment methodology 15
4. Potential Project impacts 20
4.1 Key sources of potential impact 20
5. Legislative context and standards 24
5.1 National planning and legislative context 24
5.2 State planning and legislative context 24
5.3 Regional planning and legislative context 26
5.4 Local planning and legislative context 26
5.5 Summary of relevant legislative context and standards 30
6. Existing environment 32
6.1 Regional landscape context 32
6.2. Description of the Project Area 34
7. Landscape assessment 36
7.1. Landscape character baseline 36
7.2. Landscape character assessment 36
7.3. Summary of landscape impact assessment 43
8. Visual assessment 46

8.1. Visual audiences and viewpoint selection 46
8.2. Viewpoint assessment 50
8.3. Summary of visual impact assessment 63
9. Construction and decommissioning assessment 66
9.1. Construction / installation impacts 66
9.2. Decommissioning impacts 67
9.3. Summary of construction, decommission and rehabilitation 67
10. Mitigation measures 68
11. Residual impacts 70
12. Response to planning requirements 71
13. Conclusions and recommendations 75
14. References 78
APPENDIX 1: LVIA PLANS I
APPENDIX 2: VIEWPOINTS AND VISUALISATIONS I

Table of Tables

TABLE 1: PROJECT SPECIFICATIONS 7
TABLE 2: LVIA APPROACH 8
TABLE 3: DETERMINING SIGNIFICANCE OF IMPACT 13
TABLE 4: DEFINING LANDSCAPE SENSITIVITY 14
TABLE 5: DEFINING THE MAGNITUDE OF CHANGE TO LANDSCAPE CHARACTER 14
TABLE 6: DEFINING VIEWPOINT SENSITIVITY 17
TABLE 7: DEFINING THE MAGNITUDE OF CHANGE TO VISUAL AMENITY 17
TABLE 8: DETERMINING LEVEL OF IMPACT ON VISUAL AMENITY 19
TABLE 9: POTENTIAL IMPACTS DURING CONSTRUCTION PHASE 20
TABLE 10: POTENTIAL IMPACTS DURING OPERATIONAL PHASE 22
TABLE 11: REVIEW OF KEY NATIONAL POLICY AND GUIDANCE RELEVANT TO LVIA 24
TABLE 12: REVIEW OF KEY STATE POLICY AND GUIDANCE RELEVANT TO LVIA 25
TABLE 13: REVIEW OF KEY REGIONAL POLICY AND GUIDANCE RELEVANT TO LVIA 26
TABLE 14: REVIEW OF KEY LOCAL POLICY AND GUIDANCE RELEVANT TO LVIA 26
TABLE 15: IBRA SUBREGION DESCRIPTIONS 33
TABLE 16: LIKELY IMPACT OF THE PROJECT ON LCT B: UNDULATING AND GRAZED UPLANDS 37
TABLE 17: LIKELY IMPACT OF THE PROJECT ON LCT C: LOWLAND RURAL PLAINS 39
TABLE 18: LIKELY IMPACT OF THE PROJECT ON LCT C: FORESTED LOWLANDS 41
TABLE 19: SUMMARY OF JUDGEMENT OF IMPACTS ON LANDSCAPE CHARACTER DURING OPERATION 44
TABLE 20: REPRESENTATIVE VIEWPOINTS SELECTION 46
TABLE 21: LIKELY VISUAL IMPACT OF THE PROJECT ARA ON VIEWPOINT 1 50
TABLE 22: LIKELY VISUAL IMPACT OF THE PROJECT ON VIEWPOINT 2 52
TABLE 23: LIKELY VISUAL IMPACT OF THE PROJECT ON VIEWPOINT 3 54
TABLE 24: LIKELY VISUAL IMPACT OF THE PROJECT ON VIEWPOINT 4 56
TABLE 25: LIKELY VISUAL IMPACT OF THE PROJECT ON VIEWPOINT 5 58
TABLE 26: LIKELY VISUAL IMPACT OF THE PROJECT ON VIEWPOINT 6 59
TABLE 27: LIKELY VISUAL IMPACT OF THE PROJECT ON VIEWPOINT 7 61
TABLE 28: SUMMARY OF VISUAL ASSESSMENT 63
TABLE 29: INHERENT AND POTENTIAL ADDITIONAL MITIGATION MEASURES 68
TABLE 30: LVIA RESPONSE TO IDENTIFIED POLICY ISSUES 71

Table of Figures

FIGURE 1 REGIONAL CONTEXT I

FIGURE 2A PROJECT AREA I

FIGURE 2B PROJECT AREA – DETAIL I

FIGURE 3 LVIA STUDY AREA I

FIGURE 4 LANDSCAPE PLANNING DESIGNATIONS I

FIGURE 5 LANDFORM AND HYDROLOGY CONTEXT I

FIGURE 6 LANDSCAPE CHARACTER TYPES I

FIGURE 7 KEY VISUAL RECEPTORS AND TOURIST DRIVES I

FIGURE 8 VIEWPOINT 1: NORTHWESTERLY VIEW FROM DAWSON HIGHWAY AT INTERSECTION OF ROCKFORD ROAD – EXISTING VIEW AND VISUALISATION (≈ 115° HFOV) I

FIGURE 9 VIEWPOINT 1: NORTHERLY VIEW FROM DAWSON HIGHWAY AT INTERSECTION OF ROCKFORD ROAD – EXISTING VIEW AND VISUALISATION (≈ 75° HFOV) I

FIGURE 10 VIEWPOINT 2A: EASTERLY VIEW FROM VOEWOOD PROPERTY GATE – EXISTING VIEW (≈ 65° HFOV) I

FIGURE 11 VIEWPOINT 2B: WESTERLY VIEW FROM DAWSON HIGHWAY NEAR VOEWOOD PROPERTY – EXISTING VIEW (≈ 170° HFOV) I

FIGURE 12 VIEWPOINT 3: WESTERLY VIEW FROM DAWSON HIGHWAY – EXISTING VIEW AND VISUALISATION (≈ 170° HFOV) I

FIGURE 13 VIEWPOINT 3: WESTERLY VIEW FROM DAWSON HIGHWAY – EXISTING VIEW AND VISUALISATION (NO. 1, 2 AND 3 ≈ 75° HFOV) 1 OF 3 I

FIGURE 14 VIEWPOINT 3: WESTERLY VIEW FROM DAWSON HIGHWAY – EXISTING VIEW AND VISUALISATION (NO. 1, 2 AND 3 ≈ 75° HFOV) 2 OF 3 I

FIGURE 15 VIEWPOINT 3: WESTERLY VIEW FROM DAWSON HIGHWAY – EXISTING VIEW AND VISUALISATION (NO. 1, 2 AND 3 ≈ 75° HFOV) 3 OF 3 I

FIGURE 16 VIEWPOINT 4: SOUTHWESTERLY VIEW FROM DUCK HOLES ROAD – EXISTING VIEW (≈ 170° HFOV AND ≈ 85° HFOV) I

FIGURE 17 VIEWPOINT 5: SOUTHERLY VIEW FROM FIG TREE TOAD – EXISTING VIEW (≈ 150° HFOV) I

FIGURE 18 VIEWPOINT 6: SOUTHEASTERLY VIEW FROM FIG TREE ROAD – EXISTING VIEW (≈ 115° HFOV) I

FIGURE 19 VIEWPOINT 7: EASTERLY VIEW FROM DAWSON HIGHWAY – EXISTING VIEW (≈ 150° HFOV) I

Glossary

Acronyms and key terms

AADT	Annual Average Daily Traffic
AHD	Australian Height Datum
BSC	Banana Shire Council
BSPS	*Banana Shire Planning Scheme 2021*
CICSDA	Callide Infrastructure Corridor State Development Area
CICSDA Development Scheme	*Callide Infrastructure Corridor State Development Area: Development Scheme 2012*
Client	AECOM Australia Pty Ltd
CQP	Central Queensland Power Pty Ltd, a joint venture between RES Australia Pty Ltd and Energy Estate Pty Ltd
DA2	Development Application 2
DA3	Development Application 3
DCCEEW	Department of Climate Change, Energy, the Environment and Water
ERIN	Queensland Government Environmental Resources Information Network
FNBGGGTB	First Nations Bailai, Gurang, Gooreng, Gooreng, Taribelang Bunda (Peoples)
GRC	Gladstone Regional Council
GRCPS	*Gladstone Regional Council Planning Scheme – Our Place Our Plan 2025*
ha	Hectare
HFoV	Horizontal Field of View
IBRA	Interim Biogeographic Regionalisation for Australia
km	Kilometre
kV	Kilovolt
LCA	Landscape Character Area (i.e. a geographically discrete area of a nominated LCT)
LCT	Landscape Character Type
LGA	Local Government Area
LVIA	Landscape and Visual Impact Assessment
LVIA Study Area	LVIA Study Area; comprising land within the potential viewshed of and forming the wider landscape context of the Project Area as shown on **Figure 3**
m	Metres
m AHD	Metres in Australian Height Datum
MW	Megawatt
NEM	National Electricity Market
OCG	Office of the Coordinator General

OHTL	Overhead Transmission Line
Project	Wooderson Solar Farm Overhead Transmission Line and Switchyard, as shown on **Figure 2a** and **Figure 2b**
Proponent	Wooderson Solar Development Co Pty Ltd
Project Area	Land within the Site ownership boundaries of 'the Project' as shown on **Figure 2a** and **Figure 2b**
Project Disturbance Footprint	Land defined as including permanent and temporary components for construction.
QLD	Queensland
switchyard	Option A (located to the north) and Option B (located to the south)
WSD	Wooderson Solar Development Co Pty Ltd (the Proponent) a wholly owned subsidiary of Central Queensland Power (CQP), a joint venture between RES Australia Pty Ltd (RES) and Energy Estate (CQP) Holdings Pty Ltd as trustee for Energy Estate (CQP) Holdings Trust (Energy Estate).

Glossary of Assessment Terms

Amenity	The pleasantness of a place as conveyed by desirable attributes including visual, noise, odour etc.
Bioregion/biogeographic region	Areas with the same broad landscape patterns including geology, climate, flora and fauna. They are the primary level of biodiversity classification in Queensland.
Character	A distinct, recognisable and consistent pattern of elements in the landscape that makes one landscape different from another, and often conveys a distinctive sense of place. This term does not imply a level of value or importance.
Conservation Park	An area dedicated under the *Nature Conservation Act 1992* (Qld). A conservation park is to be managed to: • conserve and present the area's cultural and natural resources and their values; and • provide for the permanent conservation of the area's natural condition to the greatest possible extent; and • provide opportunities for educational and recreational activities in a way consistent with the area's natural and cultural resources and values; and • ensure that any commercial use of the area's natural resources, including fishing and grazing, is ecologically sustainable.
Effect	The landscape or visual outcome of a proposed change. It may be the combined result of sensitivity together with the magnitude of the change.
Height	The maximum height of the relevant infrastructure (e.g. OHTL pole etc.)
Impact	The categorisation of effects. Legislative context should be considered in defining impacts and their significance.
Landscape	Landscape is an all–encompassing term that refers to areas of the earth's surface at various scales. It includes those landscapes that are: urban, rural, and natural; combining bio–physical elements with the cultural overlay of human use and values.

Landscape values	Areas protected under a regional plan and/or local government planning scheme, such as biodiversity networks, natural economic resource areas (including rural production), scenic amenity areas and landscape heritage areas. Also refer 'values' below.
Magnitude of change	The extent of change that will be experienced by receptors. This change can be adverse or beneficial. Factors that could be considered in assessing magnitude are: the proportion of the view / landscape affected; extent of the area over which the change occurs; the size and scale of the change; the rate and duration of the change; and the level of contrast and compatibility.
Mitigation	Measures to avoid, reduce and manage identified potential adverse impacts.
National Park	An area dedicated under the *Nature Conservation Act 1992* (Qld). A National Park is to be managed to: • provide, to the greatest possible extent, for the permanent preservation of the area's natural condition and the protection of the area's cultural resources and values; and • present the area's cultural and natural resources and their values; and • ensure that the only use of the area is nature-based and ecologically sustainable; and • provide opportunities for educational and recreational activities in a way consistent with the area's natural and cultural resources and values; and • provide opportunities for ecotourism in a way consistent with the area's natural and cultural resources and values.
Receptor	A place, route, viewer audience or interest group which may require assessment.
Scenic amenity	A measure of the relative contribution of each place in the landscape to the collective appreciation of open space as viewed from places that are important to the public.
Sensitivity	Susceptibility of a landscape or receptor to change without losing valued attributes.
State forest	Land reserved by the Department of Natural Resources and Mines for State forest purposes.
Values	Any aspect of landscape or views people consider to be important. Landscape and visual values may be reflected in local, state or federal planning regulations, other published documents or be established through community consultation and engagement, or as professionally assessed.
View	Any sight, prospect or field of vision as seen from a place, and may be wide or narrow, partial or full, pleasant or unattractive, distinctive or nondescript, and may include background, mid ground and/or foreground elements or features.
Viewpoint	The specific part of a wider view obtained from a viewpoint used for assessment purposes (typically up to around 75° but can be wider or narrower as required).
Viewshed	Areas visible from a particular location (may be modelled or field–validated).
Visual catchment	Areas visible from a combination of locations within a defined setting (may be modelled or field–validated).
Visual audience	Groups of visual receptors with common attributes and sensitivities to changes in views (e.g. residents, golfers, road travellers, walkers, shoppers, beach goers, farmers, recreational users).

Visual absorption capacity	Potential for a landscape or scene to absorb a particular change without a noticeable loss of valued attributes.
Visual amenity	The attractiveness of a scene or view.
Visual representation	Graphic representation of a proposal in context showing its likely appearance and scale.
Photomontages/ Visualisations	A visual representation of a proposal from a particular receptor viewpoint, on a photographic base. The methodology for the preparation of any photomontage and its accuracy should be defined.

Executive Summary

The Wooderson Solar Farm Overhead Transmission Line (OHTL) and Switchyard (the Project) will be delivered by Wooderson Solar Development Co Pty Ltd (WSD) (the Proponent). WSD is a wholly owned subsidiary of Central Queensland Power (CQP), a joint venture between RES Australia Pty Ltd (RES) and Energy Estate (CQP) Holdings Pty Ltd as trustee for Energy Estate (CQP) Holdings Trust (Energy Estate). The Project comprises of a 275 kilovolt (kV) OHTL, switchyard and associated infrastructure to connect the Wooderson Solar Farm (located approximately 40 kilometres (km) southwest of Gladstone) to the National Electricity Market (NEM) as part of Powerlink's 275 kV transmission network. The Project is located within the Gladstone Regional Council (GRC) Local Government Area (LGA) within the locality of Mount Alma.

Whilst the purpose of the Project is to connect the Wooderson Solar Farm to the grid and NEM, the solar farm, BESS and associated infrastructure will be assessed in a separate Development Application (DA) by the State Assessment and Referral Agency identified as Development Application 1 (DA1) and does not form part of this assessment. Therefore, the Wooderson Solar Farm's project infrastructure is not assessed within this Landscape and Visual Impact Assessment (LVIA).

LatStudios Pty Ltd (LatStudios) was commissioned by AECOM Australia Pty Ltd (the Client) on behalf of CQP to undertake a combined LVIA of the Project. As the OHTL extends across two planning instruments, the assessment provided within this report will support two separate DAs:

- Development Application 2 (DA2): Transmission Corridor and Switchyard within the GRC LGA to be assessed by GRC within referral to concurrence and advice agencies.
- Development Application 3 (DA3): Transmission Corridor within the Callide Infrastructure Corridor State Development Area (CICSDA) to be assessed by the Office of the Coordinator General (OCG).

The Project is proposed over 7 land parcels, totalling 2675.91 hectares (ha) (the Project Area) with approximately 11 km of 275 kV OHTL, contained within a 60 metre (m) wide easement. Within this area approximately 209.619 ha, is defined as including permanent and temporary components for construction (the Project Disturbance Footprint).

The Project will provide energy transmission via approximately 45 monopoles and a switchyard to connect the 450 megawatt (MW) Wooderson Solar Farm substation and photovoltaic solar modules into Powerlink's proposed Calvale to Calliope River Transmission Line.

The intent of this LVIA is to provide an assessment of the impacts of the proposed Project within a 10 km boundary of the Project Area (the LVIA Study Area) to satisfy the requirements set out by:

- GRC within the *Gladstone Regional Council Planning Scheme – Our Place Our Plan 2025* (GRCPS) (GRC, 2026), including recommendations within Part 8 of the GRCPS *Scenic Amenity Overlay Code*
- relevant policies of the Banana Shire Council (BSC) LGA *Banana Shire Planning Scheme 2021* (BSPS) (BSC, 2026). It is noted that the Project Area is not located in this LGA, however the southwestern part of the LVIA Study Area is located within the BSC and as visual impacts can cross LGA boundaries the BSPS has been broadly considered overall.
- the OCG within the *Callide Infrastructure Corridor State Development Area: Development Scheme 2012* (CICSDA Development Scheme) (DSDIP, 2012)

As the entirety of the Project Area falls within the GRC LGA, landscape elements that are considered to contribute to the character and amenity of the Project Area and wider LVIA Study Area were identified through the review of relevant legislation and planning policy documents specified by GRC.

The LVIA considers the requirements of the GRPS including recommendations within Part 8 of the *GRPS Scenic Amenity Overlay Code* (GRC, 2025). Relevant to the Project, the GRPS confirms that

"*The region's identified scenic amenity values are protected from inappropriate development"* and that "*Areas of high scenic and landscape values within the region are protected from inappropriate development or impacts upon their amenity, particularly in the areas of… Mount Alma…and riverine areas*."

The Part 8 Overlay Code of the GRPS Scenic Amenity Overlay Map relates to visual amenity within the *Planning Scheme Overlay – Scenic Amenities* (GRC, 2025). The purpose of the Scenic Amenity Overlay Code is "*to ensure that development in areas of high scenic amenity is sited and designed to minimise adverse impacts on those scenic amenity values.*" This includes elevated and vegetated landscapes associated with the Calliope Range to the west of the Project Area that are noted as having areas ranging from district (7.5) to regional significance (8, 9 and 10), with regards to its scenic values. The Project Area does not fall within areas identified as having district or regional scenic amenity values. However, areas of mapped scenic value are located within the LVIA Study Area and impacts on these areas are therefore considered.

As the southwestern part of the LVIA Study Area is located within BSC LGA, the provisions of the BSPS have also been considered. Key features of landscapes within the LVIA Study Area which relate to the GRCPS *Planning Scheme Overlay – Scenic Amenities Map* and BSPS include:

- Riverine areas, creeks, gullies, waterways, wetlands and bushland
- Rural landscape character
- Elevated and vegetated landscapes associated with the Calliope Range, escarpments and elevated areas
- Conservation parks and State forests including the Calliope Range State Forest located within the BSC.

Neither the GRCPS nor the BSPS include any specific recommendations relating to OHTL in connecting renewable energy projects, and neither planning schemes guidelines for OHTL apply to the landscape context of this Project.

As two of the Project's OHTL monopoles and cables are located within the CICSDA, the CICSDA Development Scheme *Schedule 1 – Consistent use table* has been considered. Based on this Schedule, the Project has been identified to fall within Column C, infrastructure that is considered *likely to compromise* the objectives of CICSDA. This seeks to ensure that the location of infrastructure (outside of gas transportation) that may intersect the CICSDA is minimised and rationalised, and that the physical characteristics of land are considered in determining the suitability and location of land uses. Further details to address the Column C consistent use specification are addressed within the DA3 report and are not considered further within the LVIA.

The physical character of the land within the CICSDA is a lowland rural plain used for grazing, which has a low level of scenic and landscape value with capacity to accommodate change. It is considered that the OHTL alignment and placement of the two OHTL monopoles are necessary to pass through the CICSDA in order to suitably connect the proposed Wooderson Solar Farm to the proposed Powerlink Calvale to Calliope River Transmission Line Reinforcement Project. In relation to impacts on views and visual amenity, siting of OHTL monopoles within the CICSDA are not uncommon and is consistent with the existing landscape character. For example, it is noted that an existing OHTL tower as part of the 275 kV Wurdong to Calvale transmission line is located approximately 2 km southwest of the Project Area within the CICSDA. Similar efforts to microsite the Project's OHTL monopoles on the rural plain will assist in integrating the infrastructure into the landscape.

Landscape character assessment is a tool for identifying what makes one place different from another. It identifies what makes a place distinctive, without necessarily assigning a value to it, in order to establish the existing character of the landscape and provide a framework for measuring the

impact of the Project on identified landscape values within the LVIA Study Area. A landscape character assessment has been undertaken for the Project which also includes consideration of whether identified Landscape Character Types (LCTs) contain areas identified as having high scenic amenity value.

The landscape character assessment has defined five LCTs within the LVIA Study Area, three of which are directly impacted by proposed Project infrastructure. The landscape character sensitivity ratings of these specific LCTs and their associated Landscape Character Areas (LCAs) are assessed as low. The landscape impact assessment has concluded that the greatest impact would be:

- Direct **Minor**, **Not Significant** impacts on LCT B (LCA B2: *Rockfield Undulating and Grazed Uplands*) due to the noticeable change the Project is anticipated to have on a very localised part of this LCT.
- Direct **Minor**, **Not Significant** impacts on LCT C (LCA C2: *North Mount Alma Lowland Rural Plains*) due to the noticeable impact of the proposed OHTL infrastructure within a rural area that features existing OHTL infrastructure. The Project will be directly noticeable as it crosses the Dawson Highway, but aside from this, the Project may be visible within the rural landscape in cleared areas and in relation to the existing grazed lowlands.
- Direct **Minor**, **Not Significant** impacts on LCT D (LCA D1: *Moura Forested Lowlands* and *LCA: D3 Doubtful Forested Lowlands*) due to barely noticeable impact with access tracks and general site disturbance proposed within a small part of the rural area. The Project may be visible within the rural landscape in cleared areas and in relation to the existing forested lowlands. The Project Area is included within areas of unmapped scenic amenity value.

These impacts will be **Not Significant** as they will only occur in a localised area and will not fundamentally change the character of the LCTs at a large scale or regional level.

The potential for views within up to 10 km of the Project Area was considered and seven public viewpoints were selected, located within 8 km of the Project Area, to represent the views of identified receptors including:

- Residents living on isolated rural properties in the farmland surrounding the Project Area
- Agricultural workers on rural properties
- Travellers, including residents, rural workers and tourists using major and minor roads within the LVIA Study Area.

It is noted that all seven viewpoints contain distant views toward elevated and vegetated landscapes of district and regional significance scenic value as defined in the GRCPS *Planning Scheme Overlay – Scenic Amenities Map*, and similarly, all views contain landscape features identified by the GRCPS and BSPS as containing unmapped scenic value found in landscape elements and characteristics.

The extent to which views across the rural plain are visible is influenced by the presence of vegetation. The visual impact assessment (assessment of impacts upon views) has concluded that there would not be any significant impacts on representative views and also concluded there would be:

- **Moderate, Not Significant** impacts on passing travellers, isolated rural residents and rural workers along the Dawson Highway (Viewpoint 1, 2a, 2b and 3) who may experience open to somewhat filtered views, and very close to moderate distant views toward the Project.
- **Minor, Not Significant** impacts on passing travellers, isolated rural residents and rural workers north of the Calliope River (Viewpoint 4 from Duck Holes Road) with moderately distant, partially filtered views toward the Project and on passing travellers and rural workers along the Dawson Highway (Viewpoint 7) who may experience distant, somewhat open views toward the Project..
- **Minor to Negligible, Not Significant** impacts on passing travellers, isolated rural residents and rural workers north of the Calliope River (Viewpoints 5 and 6 from Fig Tree Road) with

moderately distant, partially filtered views (Viewpoint 5) and distant, elevated and open views (Viewpoint 6) toward the Project.

Landscapes associated with regional and district scenic value include the Calliope Range within the LVIA Study Area, and the Boyne and Mount Alma Ranges located outside of the LVIA Study Area. The Project Area does not directly impact any of these ranges directly, with the Calliope Range (located within the LVIA Study Area) located at distance from the significant scenic area identified within the GRCPS *Planning Scheme Overlay – Scenic Amenity Map*. This distant indirect impact is considered to be ***Not Significant***.

It is acknowledged that screening views of OHTL monopoles of up to 50 m high is not possible, even if this were to be a desirable outcome. It is noted that monopoles as a thin single steel/concrete pole provide different visual amenity outcomes to other alternative OHTL pylon or multipole towers and are proposed to reduce visual impacts. However, opportunities to mitigate and enhance the integration of the OHTL infrastructure into the landscape have been described, including proposed mitigation measures that would mitigate impacts at a close distance along the Dawson Highway. The Project will introduce additional OHTL monopoles, powerlines and associated infrastructure into the landscape that will locally intensify the presence of electrical infrastructure within the landscape as well as requiring vegetation clearance within the associated Project Disturbance Footprint. It is acknowledged that mitigation outside the Project Area is not possible from all viewpoints, especially where there are elevated, unobscured and open views at a distance toward the Project.

In conclusion, this assessment has identified a ***Not Significant*** and at most ***Moderate*** visual impact arising from the Project. This is due to the introduction of additional large scale OHTL infrastructure into what is currently a relatively undeveloped natural and rural landscape, which however already features a number of OHTL, powerlines and meteorological mast (met mast) infrastructural elements. These potential views may be experienced by a moderate number of receptors within the LVIA Study Area, specifically passing motorists on the Dawson Highway as well as isolated rural residents, rural workers and travellers along other local roads. The assessment considers that the Project will not result in any significant impacts on the landscape character or general visual amenity across the LVIA Study Area.

As assessed, receptors within the LVIA Study Area are considered likely to experience a minor to negligible, up to moderate level of visual impacts and therefore, overall, the impact of the Project on the landscape and visual amenity values is considered ***Not Significant***.

1. Introduction

The Wooderson Solar Farm Overhead Transmission Line (OHTL) and Switchyard (the Project) will be delivered by Wooderson Solar Development Co Pty Ltd (WSD) (the Proponent). WSD is a wholly owned subsidiary of Central Queensland Power (CQP), a joint venture between RES Australia Pty Ltd (RES) and Energy Estate (CQP) Holdings Pty Ltd as trustee for Energy Estate (CQP) Holdings Trust (Energy Estate). The Proponent is seeking the development of the Project within the Gladstone Regional Council (GRC) Local Government Area (LGA) in Queensland and located partly within the Callide Infrastructure Corridor State Development Area (CICSDA). The Project will connect the proposed Wooderson Solar Farm, which is assessed in a separate development application (DA1) and does not form part of this assessment. The Project Area is approximately 2675.91 hectares (ha) and is situated approximately 47 kilometres (km) south-west of Gladstone and 33 km south-west of the urban centre of Calliope within the rural settlement of Mount Alma.

LatStudios Pty Ltd (LatStudios) was commissioned by AECOM to prepare a Landscape and Visual Impact Assessment (LVIA) for this Project on behalf of the Proponent. This LVIA is to support the lodgement of 2 separate development applications for a Material Change of Use (major electricity infrastructure) as follows:

- Development Application 2 (DA2): Transmission Corridor and Switchyard within the GRC LGA to be assessed by GRC with referral to concurrence and advice agencies.
- Development Application 3 (DA3): Transmission Corridor within the CICSDA to be assessed by the Office of the Coordinator-General (OCG).

The Project will provide energy transmission via OHTL monopoles and a switchyard to connect the 450 megawatt (MW) Wooderson Solar Farm and BESS to Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project.

The Project's OHTL transmission line is 11 km in length, contained within a 60 metre (m) wide easement, and in its operation will comprise of 45 monopole towers and a switchyard.

At the stage of this assessment, 2 options for the switchyard have been proposed in the western part of the Project Area adjoining to the existing 275 kilovolt (kV) Wurdong to Calvale transmission line:

- Option A: located to the north, near OHTL monopoles numbered 41, 42 and 43.
- Option B: located to the south, near OHTL monopoles numbered 44 and 45.

As both options are located within close proximity to one another and consist of the same infrastructure components, for the purposes of this LVIA, they have both been included and assessed as one component. This has been referred to as 'the switchyard'.

Whilst the purpose of the Project is to connect the Wooderson Solar Farm to the electricity grid, the solar farm, BESS and associated infrastructure is a part of a separate development application to SARA requiring distinct approval conditions and is excluded from this development application (as noted above). Therefore, the Wooderson Solar Farm does not form part of this assessment.

The intent of this LVIA is to provide an assessment of the impacts of the proposed Project to satisfy the requirements set out by GRC within the *Gladstone Regional Council Planning Scheme – Our Place Our Plan 2025* (GRCPS) (GRC, 2026), including recommendations within Part 8 of the GRCPS *Scenic Amenity Overlay Code*, and the requirements set out by the OCG relating to the requirements of the CICSDA within the *Callide Infrastructure Corridor State Development Area: Development Scheme 2012* (CICSDA Development Scheme) relating to the minimisation and rationalisation of infrastructure and the suitability of physical land characteristics (DSDIP, 2012).

Based on these requirements, the LVIA report provides an assessment of the anticipated landscape and visual effects and impacts of the Project during construction, operation and decommissioning and/or rehabilitation phases on the Project and its wider landscape context (**the LVIA Study Area**) as shown in **Figure 3**.

The intent of this LVIA is to determine the potential Project impacts upon existing identified landscape and visual amenity values. In summary, the objectives of this LVIA are to:

- Undertake a baseline assessment describing existing environmental values of the LVIA Study Area with respect to landscape character and visual amenity.
- Determine the existing landscape character types (LCTs) and degrees of visual sensitivity and magnitude of change that the LCTs will experience with the implementation of the Project.
- Describe the existing landscape (landscape receptors) and identify those people who experience and value views of the landscape (visual receptors).
- Identify and evaluate key project risks on landscape and/or visual values during daytime conditions.
- Describe any Project modifications or management techniques that can mitigate identified landscape and visual impacts.

1.1. Project description

The Project Area is located approximately 40 km south-west of Gladstone, 33 km south-west of Calliope and is situated in the locality of Mount Alma. The regional context of the Project Area is shown in **Figure 1**. Land use within the wider LVIA Study Area is predominantly agricultural land used for cattle grazing and the Project Area is generally characterised by cleared flat to gently undulating and open landscapes within low lying plains, containing areas of native *Eucalypt* spp. dominated open forest.

The Project will provide energy transmission via OHTL monopoles and a switchyard to connect the 450 MW Wooderson Solar Farm substation at the eastern end of the Project Area to Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project at the western end of the Project Area.

The OHTL transmission line is in total approximately 11 km in length, contained within a 60 m wide easement. The section of the Project Area located within CICSDA is approximately 840 m in length, and is comprised of 2 OHTL monopoles and cabling. The section of the Project Area located outside of CICSDA is approximately 10.16 km in length and is comprised of 43 OHTL monopoles.

The Project Area comprises the following key features of relevance to visual amenity:

- Approximately 45 monopoles with a maximum height of 50 m (steel or concrete) and associated 275 kV powerlines.
- Powerlink 275 kV switchyard up to a maximum height of 30 m.
- Associated infrastructure including internal access tracks and gates.

The proposed infrastructure dimensions have been listed below in **Table 1** and further detail is provided in **Section 4**. These specifications are subject to confirmation during detailed design.

Table 1: Project Specifications

Feature	Statistic
Number of monopoles within OHTL corridor	Approximately 45
Nominal monopole heights	Up to 50 m maximum
Proposed length of Transmission Line	11 km (of which 840 m is within CICSDA)
Colour and/or finish	Grey steel or concrete

The Project Area will be located on land across 8 lots (of which one is within CICSDA) as detailed in **Section 5: Legislative context and standards** below and as shown on **Figure 4 in Appendix 1.**

The Project Area is located within the rural zone of the GRCPS. Access to the Project Area is primarily via the Dawson Highway and the Project Area is expected to have a Disturbance Footprint of approximately 209.619 ha, (defined as including permanent and temporary components for construction) located within the LVIA Study Area, refer to **Figure 2a** and **Figure 2b**.

2. Scope of assessment

2.1. Approach to the LVIA

Landscape impacts include physical changes to the fabric of the landscape, as well as perceptual changes in the character of the landscape. They also include impacts on areas designated for their scenic or landscape qualities at a national, regional or local level, for example National Parks or important recreation areas. This aspect is considered in relation to relevant legislation as described in **Section 5: Legislative context and standards**).

Visual impacts relate to changes in views and the appearance of the Project in those views. The approach to this LVIA is set out in **Table 2**.

Table 2: LVIA Approach

Baseline Assessment	
Stage 1	**Review of landscape and visual legislative context:** A review of any landscape or scenic amenity designations applying to the Project Area and/or the wider LVIA Study Area at national, state, regional or local level (including local planning designations).
Stage 2	**Desktop landscape assessment:** A review of available information describing the landscape characteristics of the LVIA Study Area.
Stage 3	**Desktop visual assessment:** Identification of potential key visual receptor audiences (viewers) such as private residences, roads (including any nominated scenic routes), public parks and recreation areas (including any nominated scenic lookouts and recreation trails) and other properties (including farmland, institutions etc.). The assessment is also informed by Google Earth, Queensland Globe and other desktop-based mapping tools.
Stage 4	**Field survey:** Field survey (4 to 6 November 2024) to confirm baseline findings and obtain photographs of representative viewpoints in the field, including images to use as a base for the preparation of photomontages.
Preparation of the LVIA	
Stage 5	**Definition, description and illustration of the landscape and visual baseline:** Including Landscape Character Assessment (LCA) and landscape and visual sensitivity.
Stage 6	**Mapping and supporting illustrations:** Preparation of mapping to support the LVIA and compilation of site photography to illustrate the existing views obtained from selected representative viewpoints.
Stage 7	**Assessment of magnitude of change:** Identification of the magnitude of change on the landscape resource during the construction, operation, and decommissioning phase.
Stage 8	**Significance assessment:** Evaluation of the significance of the proposed change on the landscape and visual resource.

Stage 9	**Mitigation potential:** This comprises a consideration of the opportunity to minimise and mitigate Project impacts.
Stage 10	**Residual assessment:** Consideration of impacts of the Project assuming all recommended mitigation is implemented.

3. Methodology

3.1. Relevant guidelines and standards

The approach to the LVIA has been developed with reference to accepted guidelines from relevant Australia jurisdictions and elsewhere, including:

- AILA (Australian Institute of Landscape Architects) Queensland *Guidance Note for Landscape and Visual Assessment* (GNLVA) (AILA, 2018)
- *Environmental Impact Assessment Practice Note – Guidelines for Landscape Character and Visual Impact Assessment EIA-N04 Version 2.3 (practice note EIA-N04)* (Transport for New South Wales, 2023)
- *The Guidelines for Landscape and Visual Impact Assessment*, Second Edition (GLVIA2) (The Landscape Institute and the Institute of Environmental Management and Assessment (LI & IEMA), UK, Spon Press, 2002)
- *The Guidelines for Landscape and Visual Impact Assessment*, Third Edition (GLVIA3) (The Landscape Institute and the Institute of Environmental Management and Assessment (LI & IEMA), UK, Routledge, 2013)
- *Topic Paper 6: Techniques and Criteria for Judging Capacity and Sensitivity* (Scottish Natural Heritage and The Countryside Agency, UK, 2006).

3.2. Influence of community perception on LVIA methodology

While community perception of OHTLs is an important consideration in assessing the landscape and visual impact of the Project, research indicates that the sentiments of communities toward OHTLs are varied, complex and challenging.

Insights show that while a significant number of Australians (between 47% and 66% across various reports) support or feel positive toward the concept of energy transition, there is generally little or limited knowledge about large renewable infrastructure, technology, and about the energy transition that OHTLs provide within broader energy transition efforts (AEMO, 2025).

A survey conducted in 2023 by the Commonwealth Scientific and Industrial Research Organisation (CSIRO) of Australian attitudes to the renewable energy transition with over 6,700 participants indicated that more than 80% of Australians would tolerate living within 10 km of solar or wind farms. However, compared to other types of renewable energy infrastructure, acceptance of living near associated OHTLs was lower, with 23% of people rejecting it but 77% at least tolerating it. Australians saw less of a role for transmission lines in the energy transition compared to solar and windfarms (CSIRO, 2023).

Higher levels of concern were raised about the local impact of transmission lines compared to other technologies, particularly for residents of peri-urban and rural areas who naturally have stronger sentiments about such developments. Concerns about reducing visual attractiveness of local landscape and devaluing property were also higher for transmission lines compared to other infrastructure (CSIRO, 2023).

The perceived benefits of all technologies were quite similar, which suggests that one of the main impediments to higher levels of local acceptance for transmission lines is the concern about specific impacts, not a perceived lack of benefits.

As identified by Madigan (et al, 2023) other areas of public concern with OHTLs can be associated with the local community's attachment to place (length of time in the place), and place identity, that if

threatened by impending changes in the area, will influence their response to a project. Importantly, as each site has its own characteristic, context considerations will change for each project will be essential to evaluate, with adequate information and knowledge sharing, good governance to minimise risks and adequate engagement and consultation.

The consultation and engagement activities undertaken by the Proponent for the Project have included ongoing engagement with host-landholders, residents and the broader community through newsletters, newspaper advertisements, project updates, and responses to enquiries. Engagement activities, particularly to inform the Social Impact Assessment, have included stakeholder meetings, briefings, updates, consultation and community information sessions.

Targeted consultation has also been undertaken with government agencies, GRC, regulators and technical specialists to inform the Project design, Social Impact Assessment and Community Benefit Agreement.

From an early stage, the Proponent has engaged with the Traditional Owners for the lands including the Project Area, the First Nations Bailai, Gurang, Gooreng, Gooreng, Taribelang Bunda Peoples (FNBGGGTB Peoples). To date the Proponent has provided an overview of the Project, commenced discussions about Aboriginal cultural heritage issues, and explored a range of partnership opportunities with the FNBGGGTB Peoples. The Proponent and the FNBGGGTB Peoples have undertaken a joint site visit of the Project to identify cultural values during soil testing for an agricultural land assessment. The stakeholder engagement strategy will include a continued relationship and consultations with the FNBGGGTB Peoples. The Proponent considers that the formation of a strong and sustainable relationship with the FNBGGGTB Peoples is central to the Project's success.

3.3. Desktop analysis

Key information sources have been identified and reviewed as a component of the desktop analysis. These sources include:

- Relevant planning schemes, policies and guidelines from the State Government and local councils
- Publicly available information on recreation spaces and public visitor areas
- Digital satellite aerial imagery (obtained September 2025 from Google)
- Information available on Queensland Globe (State of Queensland, 2025) and Digital Atlas of Australia (Commonwealth of Australia, 2025)
- Cadastral data (showing roads, property boundaries and built areas)
- Queensland Interim Biogeographic Regionalisation of Australia (IBRA) bioregion data
- Existing infrastructure.

3.4. Field survey

A field visit to assess the impacts of the Project was carried out from 4 to 6 November 2024 by 2 qualified landscape architects and/or landscape planners both with experience in landscape photography. The weather during the field assessment was generally dry and sunny with moderate level of haze due to burn offs at nearby State forests, but still enabling sufficiently clear views toward the Project Area for the purposes of undertaking LVIA.

The field assessment was used to ground truth the findings of the desktop assessment and to undertake an onsite assessment of landscape character and visual amenity. Photographs were taken to:

- Portray landscape character
- Illustrate the influence of existing OHTL infrastructure and other infrastructure within the LVIA Study Area
- Inform the viewpoint assessment from representative viewpoints.

The field visit focused on those aspects of the landscape with potential to be of the greatest sensitivity to the Project and to gain an appreciation of those aspects of the Project infrastructure that is most likely to affect landscape character and visual amenity in the context of the existing electricity infrastructure present. Viewpoints were recorded while visiting the Project Area using an iPad with a GPS Kit HD App. The camera used also recorded a GPS location for each photograph.

3.5. Identification of potential Project impacts

A component of the LVIA includes a review of the Project infrastructure components to inform a description of infrastructure and exemplar imagery that is likely to be associated with the Project, such as the presence of the OHTL monopoles. These potential impacts are further discussed in **Section 4: Potential Project impacts**.

3.6. Landscape impact assessment methodology

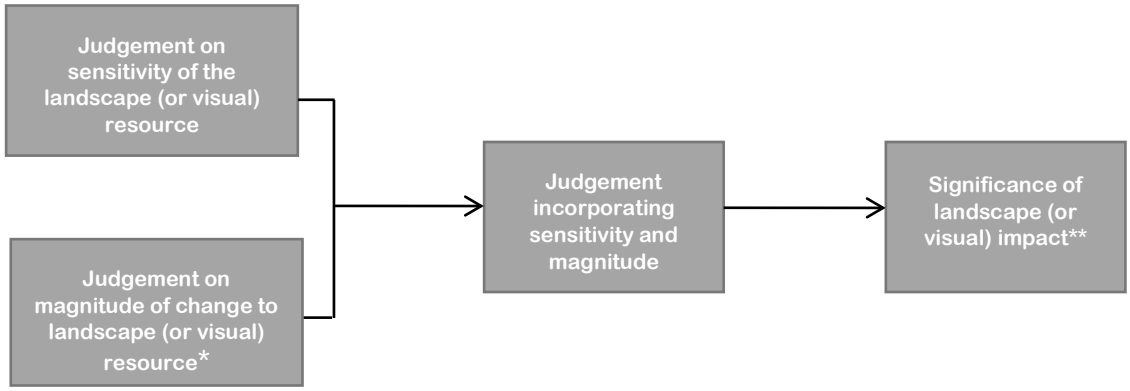
Landscape Character Assessment is a tool for identifying what makes one place different from another. It identifies what makes a place distinctive, without necessarily assigning a value to it. This approach has been used to establish the existing character of the landscape and to provide a framework for measuring the impact of the Project on landscape character. The Landscape Character Assessment also includes consideration of whether identified LCTs contain areas identified as having high scenic amenity value.

The LCTs have been defined by both high level desktop assessment and through fieldwork assessment. LCTs have been defined to provide a framework for describing these areas methodically. Where necessary, these have been further subdivided into Landscape Character Areas (LCAs), which are geographically distinct areas. The general character of the landscape is described in **Section 6: Existing environment**, whilst the identified LCTs are described in **Section 7: Landscape assessment**

The assessment of anticipated sensitivity (and consequent likely impact to) landscape character and amenity is based on the scale and layout of the Project and how this relates to the characteristics of the receiving landscape. Consideration is also given to designations or landscape policies (as identified, for example, in a local planning scheme) in determining the sensitivity of a landscape to change.

The significance of impact is determined by considering the sensitivity of the landscape receptor and the magnitude of change expected because of the proposed development, as shown in the process diagram in **Illustration 1**.

Illustration 1: Approach to evaluating the significance of landscape (or visual)



* Quantification of the magnitude of impacts is based on the scale or degree of change to the landscape resource, the nature of the impact and its duration.

** Overall landscape impact is determined by combining the sensitivity of the landscape resource with the magnitude of landscape change. Professional judgement is used to determine the overall significance of impact based on these two elements.

The overall significance of a potential impact is determined by considering the sensitivity of the landscape or visual receptor and the magnitude of change anticipated that is likely to occur due to the Project (**Table 3**).

Table 3: Determining significance of impact

Significance of impact		**Magnitude of change**			
		High (Dominant change)	**Medium** (Considerable change)	**Low** (Noticeable change)	**Negligible** (Barely perceptible change)
Sensitivity	**High**	Major	Moderate to Major	Moderate	Minor to Moderate
	Medium	Moderate to Major	Moderate	Minor to Moderate	Minor
	Low	Moderate	Minor to Moderate	Minor	Minor to Negligible
	Negligible	Minor to Moderate	Minor	Minor to Negligible	Negligible

'Major and 'Moderate to Major' significance of impact is considered a 'significant' impact.

Where magnitude of change is 'no impact' the significance is 'no impact'.

3.6.1. Judgement of landscape sensitivity

The sensitivity of a landscape is judged on the extent to which it can accept change of a particular type and scale without adverse effects to existing landscape character. Levels of sensitivity, shown in **Table 4,** vary according to the type of development and the nature of the landscape. Key aspects that have been considered when identifying the level of sensitivity associated with each landscape character type include:

- The landscape's inherent values (e.g. perceptual qualities, cultural importance, and any specific values that may apply such as landscape planning designations).

- The landscape's ability to absorb changes associated with the Project (e.g. the extent to which may fit or be absorbed into the landform, land use, pattern, scale or texture of the existing landscape).

Table 4: Defining landscape sensitivity

Sensitivity of landscape	Attributes of landscape sensitivity categories
High	A landscape protected by national designation and/or widely acknowledged for its quality and value or a landscape with distinctive character and low capacity to accommodate the type of change envisaged.
Medium	A moderately valued landscape, perhaps a regionally important landscape and/or protected by regional and/or state designation or on a scenic amenity overlay in a local planning scheme, and/or where its character, land use, pattern and scale have limited capacity to accommodate a degree of the type of change envisaged.
Low	A landscape valued to a limited extent, perhaps a locally important landscape or where its character, land use, pattern and scale is likely to have the capacity to accommodate the type of change envisaged.
Negligible	A landscape which is not valued for its scenic quality or where its character, existing land use, pattern and scale are tolerant of the type of change envisaged, and the landscape has capacity to accommodate change.

3.6.2. Magnitude of change to landscape character

The magnitude of change to landscape character depends on the nature, scale and duration of the change that is expected to occur. The magnitude of change also depends on the loss, change or addition of any feature to the existing landscape and is based upon that part of the landscape character type which is likely to be impacted to the greatest extent by the Project before the application of any mitigation.

Magnitude of change is described as negligible (barely perceptible change), low (noticeable change), medium (considerable change) or high (dominant change), as illustrated in **Table 5**. The descriptions of magnitude and sensitivity are illustrative as there is no defined boundary between levels of impacts.

Table 5: Defining the magnitude of change to landscape character

Magnitude of Change	Typical Examples
High	Dominant change: A clearly evident and frequent and/or continuous change in landscape characteristics affecting an extensive area, which is likely to fundamentally change the character of the landscape.
Medium	Considerable change: A considerable change in landscape characteristics, frequent or continuous and over a wide area or a clearly evident change, but over a restricted area.
Low	Noticeable change: A noticeable change in landscape characteristics over a wide area or a considerable change over a restricted area but will not fundamentally change the character of the landscape.
Negligible	Barely perceptible change: An imperceptible, barely or rarely perceptible change in landscape characteristics.
No impact	No change: No change in landscape characteristics.

3.6.3. Overall significance of impact on landscape character

An evaluation of overall potential impacts on landscape character is based on the sensitivity of the existing landscape to change and the magnitude of change that is likely to occur. No prescribed methods for assessment of significance of landscape impacts exist in Queensland. Therefore, in line with the GNLVA (AILA, 2018) (which is frequently cited in LVIA methodologies endorsed by LGAs across Queensland) professional judgement and experience are applied to identify the level of significance. Each landscape receptor is assessed on its own merits, as factors unique to each circumstance need to be considered. However, there are general principles which can be used as a guide to this process that provide transparency about how judgements have been made. The overall significance of change to landscape amenity is determined by using **Table 3**.

3.7. Lighting assessment

It is understood that minimal permanent Project lighting is proposed. At the perimeter of the Project, motion and/or manually activated surprise lighting may be installed. This would only be installed in certain locations to deter intruders, and would be used instead of permanent perimeter lighting. Lighting would also be provided where required for security and safety, for example at the switchyard in accordance with Powerlink guidelines. Any required lighting would also comply to the relevant Australian Standard. A lighting assessment to address Australian Standard / New Zealand Standard *4282:2023 – Control of the Obtrusive Effects of Outdoor Lighting* has not been completed as potential lighting is limited in extent and potential duration of use and is only proposed for the purposes of safety and security (which are excluded from the standard). However, where lighting is used, mitigation measures have been identified in **Section 10**.

3.1. Visual impact assessment methodology

3.1.1. Identification and description of visual receptor audiences and viewpoints

The visual assessment is based upon the identification, through desktop and fieldwork assessments, of potential views to the Project, particularly any major views or outlooks identified in legislation or planning documents during the desktop phase or through stakeholder and community consultation.

Visual receptor audiences are assessed and described in terms of the views which can be obtained from selected representative viewpoints within the LVIA Study Area. The specific viewpoints used for the assessment have been selected based upon the likelihood of these receptors to experience views toward the Project. Consistent with typical landscape and visual assessment practice, viewpoints on private properties have not been visited or assessed. Where appropriate, publicly accessible locations nearby have been selected to represent private views.

Potential representative visual audiences and receptors have been identified based on a range of parameters including:

- Proximity of the receptor: the most affected visual receptors are typically anticipated to be located within proximity to the Project Area (a nominal 10 km offset) unless located at an elevated vantage point
- Type of visual receptor and/or audience, for example:
    - A permanent resident of a dwelling or homestead
    - Drivers or passengers of vehicles passing through the assessment area
    - Members of the public accessing marked recreational areas (for example in National Parks, State forests, cycle ways, footpaths and public parks and sportsgrounds)
    - An industrial or commercial worker (excluding those employed as part of the Project).

These visual receptor audiences and representative viewpoints are discussed further in **Section 8.1: Visual audiences and viewpoint selection**.

3.1.2. Preparation of visualisations

Visualisations (sometimes referred to as photomontages) are artists' illustrations that aim to represent an observer's view of a proposed development. For the purposes of this assessment, visualisations have been compiled to appreciate the potential visual impact of the presence of the Project from a selection of the representative viewpoints, which are described in **Section 8.2: Viewpoint assessment** and illustrated in A3 format (in **Appendix 2**).

The methodology for the visualisation production has been based on the *Guidelines for Landscape and Visual Impact Assessment Second Edition* (LI & IEMA, 2022) and *Guidelines for Landscape and Visual Impact Assessment Third Edition* (LI & IEMA, 2013).

The photomontages have been generated using digital photographs stitched from images obtained while visiting the Project Area, GIS software, and 3D modelling software (Google Sketchup) to geo–locate, generate and render the Project infrastructure (OHTL monopoles and switchyard infrastructure). Existing points onsite and background terrain is used to reference the position and/or direction of the photography with the 3D model camera. The rendered outputs are then layered into the existing image where background and foreground of the imagery is separated to allow for the rendered information to be inserted (Adobe Photoshop). It should be noted that every reasonable effort has been made to ensure the images are representative and have not been manipulated to downplay the extent of impact. This has, for example, included ensuring that the rendering provides an adequate 'contrast' between the Project infrastructure and background elements (e.g. lighter rendering against a dark backdrop and vice versa). For those visualisations, where it is considered that the infrastructure blends into the existing view, a coloured 'wireframe' images have also been produced and are included in the report to highlight the location of Project infrastructure in the view.

To ensure the photomontages consistently present a view which is representative of the human eye, the field assessment photographs were taken at average human viewing height at 1.6 m. The photos were taken using a Canon EOS 6D Mark II body with a Sigma 50 mm f/1.4 DG JSM lens or, where deemed appropriate to the viewing location, they were taken using a Canon EOS 6D Mark II body with a Sigma 24 mm f/1.4 DG JSM lens with a 73.6 mm field of view. The Canon EOS 6D is a full sensor lens. Using a 50 mm lens it has an equivalent Field of View as a Standard Single Lens Reflex (SLR) using 35 mm film and 50 mm focal length, which is the standard (albeit technologically outdated) recommendation for obtaining photographs that are representative of the human field of vision (40 degrees). The 24 mm lens enables a wider field of view to be captured which aids accuracy in the preparation of visualisations and images can be cropped digitally to be representative of a 50 mm viewpoint.

Photo stitching software and Adobe Photoshop were used to piece together the adjoining images to produce the montage. Although the parameters of human vision when stationary is often quoted as falling between 45 and 60° (SNH, 2017), humans generally move their eyes, heads and bodies as necessary to experience a view. Therefore, a wider field of view has been used for the photomontages included in this assessment of up to 170°.

3.1.3. Judgement of visual sensitivity

The sensitivity of each viewpoint and the visual receptor audiences which it represents is dependent upon the:

- importance of the view, its existing scenic qualities, and the presence of other existing man–made elements in the view
- type of the visual receptor audience and their likely interest in the view (e.g. residents, visitors to important and/or valued landscapes or visitors to non–designated areas, motorists)
- volume of visual receptors and the duration of time that receptors spend experiencing the view.

The *Guidelines for Landscape and Visual Impact Assessment* (LI & IEMA, 2002) states "*changes affecting large numbers of people are generally more significant than those affecting a relatively small group of users*." Similarly, the Guidelines for Landscape and Visual Impact Assessment (LI & IEMA, 2013) states the visual receptors most susceptible to change include "… *residents at home…people, whether residents or visitors who are engaged in outdoor recreation, including use of public rights of way whose attention or interest is likely to be focused on the landscape and on particular views; …communities where views contribute to the landscape setting enjoyed by residents in the area*". This guidance is reflected in the method used to assess the sensitivity of the viewpoints to the Project e.g., views from a regionally important location where viewers' interest may be specifically focussed on the landscape.

Levels of sensitivity, shown in **Table 6**, vary according to the type of development and the visual receptor audience.

Table 6: Defining viewpoint sensitivity

Sensitivity of viewpoint	Attributes of viewpoint sensitivity categories
High	Large numbers of viewers or those with proprietary interest and prolonged viewing opportunities such as residents and users of attractive and/or well–used recreational facilities. Views from a regionally important location where viewer interest is specifically focussed on the landscape (e.g. a scenic lookout).
Medium	Medium numbers of residents (e.g. rural communities and townships) and moderate numbers of visitors with an interest in their environment (e.g. visitors to State forests, including bush walkers, horse riders, trail bikers). Larger numbers of travellers with an interest in their surroundings (e.g. local designated scenic routes). Views encompassing landscapes valued on account of their scenic amenity values (e.g. identified by a scenic overlay in a local planning scheme).
Low	Small numbers of rural residents, receptors with a passing interest in their surroundings or transient views (e.g. those travelling along principal roads and/or where scenic quality is already compromised). Viewers whose interest is not specifically focussed on the landscape (e.g. workers, commuters, truck drivers).
Negligible	Very occasional numbers of viewers with a passing interest in their surroundings (e.g. those travelling along minor roads, and views from the air).

3.1.4. Magnitude of change to visual amenity from representative viewpoints

The magnitude of change to views and visual amenity depends on the nature, scale and duration of the change that is expected to occur. The magnitude of change also depends on the loss, change or addition of any feature in the field of view of the receptor; or any change to the backdrop to, or outlook from, a viewpoint. The assessment assumes a worst–case infrastructure height, without mitigation. The level of impact on a view depends on the extent of visibility, degree of obstruction of existing features, degree of contrast with the existing view, angle of view, duration of view and distance from the Project.

Magnitude of change is described as negligible (barely perceptible change), low (noticeable change), medium (considerable change) or high (dominant change), as illustrated in **Table 7** below.

Table 7: Defining the magnitude of change to visual amenity

Magnitude of change	Typical examples
High	Dominant change: Major changes in view at close distances, affecting a substantial part of the view, continuously visible for a long duration, or obstructing a substantial part or important elements of view. Generally, short distances (typically 0 to 500 m) to the nearest Project infrastructure.
Medium	Considerable change: Clearly perceptible changes in views at intermediate distances, resulting in either a distinct new element in a significant part of the view, or a more wide-ranging, less concentrated change across a wider area. Generally, short to medium views (typically around 500 m to 1.5 km) to the nearest Project infrastructure.
Low	Noticeable change: Minor changes in views at long distances or visible for a short duration, and/or are expected to blend in with the existing view to a moderate extent. Generally, medium to long distance views (typically around 1.5 km to 5 km) to the nearest Project infrastructure
Negligible	Barely perceptible change: Change which is barely visible at a very long distance or visible for a very short duration, and/or is expected to blend with the existing view. Distant views (generally, > 5 km) to the nearest Project infrastructure.
No impact	No change: No visible change as a result of Project infrastructure.

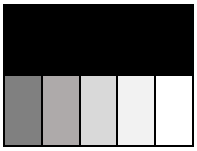
3.1.5. Overall significance of impact on visual amenity from representative viewpoints

The evaluation of overall potential impacts on visual amenity is based on the sensitivity of existing views to change and the magnitude of change that is likely to occur. No prescribed quantitative methods for assessment of significance of impacts on visual amenity exist within Queensland. Therefore, professional judgement and experience are applied in order to identify the level of significance based on the parameters set out in the GNLVA (AILA, 2018). Each viewpoint is assessed on its own merits, as factors unique to each circumstance need to be considered. However, there are general principles which can be used as a guide to this process. These provide transparency about how judgements have been made. The overall significance of impact to visual amenity and individual viewpoints is determined by using **Table 8**.

Table 8: Determining level of impact on visual amenity

Level of impact		Magnitude of change to visual amenity			
		High (Dominant change)	**Medium (Considerable change)**	**Low (Noticeable change)**	**Negligible (Barely perceptible change)**
Sensitivity of viewer	**High**	**Major**	**Moderate to Major**	**Moderate**	**Minor to Moderate**
	Medium	**Moderate to Major**	**Moderate**	**Minor to Moderate**	**Minor**
	Low	**Moderate**	**Minor to Moderate**	**Minor**	**Minor to Negligible**
	Negligible	**Minor to Moderate**	**Minor**	**Minor to Negligible**	**Negligible**

Where magnitude of change is 'No impact' the significance is 'No impact.'



Denotes a 'Significant' impact.

Denotes a 'Not Significant' impact.

Impacts which are graded as being 'moderate,' 'moderate to major' or 'major' are those which are given greatest weight, relative to other levels of visual impact, in decision making. They usually concern immediate landscapes around proposed development sites and close views seen by sensitive viewers. 'Minor to moderate' levels of impact are of progressively reducing importance. Impacts graded as 'minor' also constitute effects which warrant consideration, but individually carry little weight in the decision–making process.

Impacts on the visual resource have been described by representative views in the LVIA Study Area. Impacts can be short term (i.e. those occurring during installation and/or construction of a development) or long term (i.e. those lasting for the lifetime of the Project). In addition, they can be wide–spread (i.e. taking up a large proportional change in the view) or localised.

For the purposes of this assessment, subjective interpretation of the Project has been avoided. Rather, the focus has been directed on the significance of the impact (i.e. a transparent judgement on the sensitivity of the visual resource, combined with the anticipated magnitude of change to the view).

4. Potential Project impacts

4.1 Key sources of potential impact

This section describes the key components of the Project that are relevant to this LVIA.

Key components of the development activities anticipated for the construction, installation, operation, decommissioning and rehabilitation of the Project, which are relevant to the assessment of landscape and visual impacts are identified. In describing OHTL monopoles, it is necessary to understand the following components:

- Monopole site benching
- Concrete slab foundations
- Formation of monopole pads
- Steel and/or concrete monopoles
- OHTL cables
- Associated infrastructure including gates, grids, washdown bays and access tracks as required
- Construction compound and laydown areas.

4.1.1 Construction phase

The focus of the LVIA is the operational impact described in **Section 4.1.2: Operational phase** below. However, construction impacts have also been considered.

The construction phase of the Project is temporary and is estimated to commence in March 2029 with anticipated completion after 15 months. Construction timeframes will be dependent on securing Project approvals, timing and staging of construction of other assets including the solar farm and the proposed Calvale to Calliope River Transmission Line Reinforcement Project. Note that these timeframes are based on construction of the assets only. The OHTL will only commence export of electricity during commissioning of the solar farm.

Site components and activities that may potentially impact on the landscape (including landscape features, character and amenity) and views and visual amenity during construction are described in **Table 9.** It is noted that construction activities will generally be limited to daylight hours and will vary depending on the season. However, it is expected that most works will occur during standard construction hours of 7 am to 6 pm, Monday to Saturday. During certain construction activities, works may be required to be undertaken outside of standard hours (i.e. Sunday or night-time periods). In these instances, appropriate mitigation and management measures will be incorporated into the Construction Environmental Management Plan (CEMP).

Table 9: Potential impacts during construction phase

Construction activities and infrastructure	Indicative Project imagery
Enabling works Select vegetation clearing followed by the establishment of temporary constructions compound(s) and fencing and civil works (i.e. levelling, earthworks, temporary water storage and local vegetation clearance).	 Source: LatStudios

Construction compounds, laydown areas and lighting Temporary construction compound, laydown and stockpile areas will be located across the Project Disturbance Footprint and where possible in existing cleared areas. A range of options are being considered and it is anticipated that up to 3 construction compounds and up to 7 laydown areas may be required for the switchyard. These areas will be decommissioned post-construction. Construction compounds will typically include a storage area, offices and meeting room, ablution facilities, canteen and parking. Temporary after-dark construction lighting will be used onsite.	 Source: LatStudios
Unsealed access tracks Construction of access tracks to each high voltage OHTL monopole and associated infrastructure including gates, grids and locations. Where practicable, existing cleared tracks will be used and upgraded where needed to minimise vegetation clearing and fragmentation. New tracks will also be placed in cleared areas where required and clearing widths minimised.	 Source: LatStudios
Construction of Project infrastructure Construction of associated foundations and high voltage OHTL monopoles will comprise installation of gates, grids, clean down bays and access tracks; monopole site benching; foundation excavation and installation; establishment of brake and winch sites; and structure assembly and erection using a large mobile crane.	 Source: Cowell Electric
Construction (stringing) of high voltage OHTL Conductor and stringing of high voltage power lines will be carried out as either conventional or aerial stringing. Conventional stringing involves the clearing of 2 or more tracks, following which earth moving equipment (tractor, bulldozer or similar) will then pull steel draw wire across the ground in a slack state from one structure to another down the alignment. The draw wire is then manually raised and placed into the stringing pulleys attached to the cross arms ready for running conductor. Aerial stringing is the method of attaching draw wire or specialised rope to either a helicopter or drone which is then flown from one structure to another lowering the draw wire or rope directly into the stringing pulleys. Stringing will be completed in sections of varying length between termination structures, depending on constraints, terrain, and access. Reinstatement of all disturbed areas that will not accommodate permanent infrastructure, will be undertaken progressively during construction, where safe to do so. The short-term goal of reinstatement is the stabilisation of soils to provide a suitable matrix for vegetation establishment to aid in preventing erosion.	 Source: Australian Power Industry Partners

4.1.2 Operational phase

At the end of the Wooderson Solar Farm's operational life (currently anticipated to be up to 35 years), it is anticipated to be either upgraded (subject to additional planning approvals, as required) or decommissioned. The decommissioning of the solar farm would result in the Project's OHTL being no longer required so this would also be decommissioned. It is anticipated that the Project's switchyard would remain operational beyond this time as a Powerlink network asset. The potential impacts on the landscape (including landscape features, character and qualities) and visual amenity during operation are outlined in **Table 10.** Site lighting will be as required to maintain safety and security, with 2 potential lighting components of motion and/or manual surprise lighting as a deterrent near publicly accessible areas and safety and security lighting in relation to the switchyard. Where lighting is used, mitigation measures would be as described in **Section 10** below.

Table 10: Potential impacts during operational phase

Operational activities and infrastructure	
275 kV electricity transmission monopoles and associated overhead power lines The Project includes 275 kV monopole steel suspension or tension transmission lines (optical ground wire transmission line with associated conductors) supported by galvanised steel and/or concrete monopole transmission towers at up to 50 m in height and located approximately every 130 to 380 m depending on local topography. The OHTL design will be finalised during detailed design. The proposed OHTL alignment will undercross the existing 275 kV Wurdong to Calvale OHTL and proposed Calvale to Calliope River Transmission Line Reinforcement Project. During operation, maintenance staff will carry out scheduled inspections of the line, easement and access tracks depending on the risk of vegetation growth. These inspections (patrols) would be undertaken either by vehicle or helicopter. Following inspection, clearance of regrowth vegetation will be undertaken in accordance with an Operational Environmental Management Plan (OEMP).	 Source: Australian Power Industry Partners
Switchyard A new switchyard is proposed to be located at the western end of the OHTL for cut-in connection to Powerlink's proposed Calvale to Calliope River Transmission Line Reinforcement Project. The final location of this switchyard is awaiting confirmation from Powerlink, with two potential locations assessed for the purposes of this application being Option A and Option B. The switchyard will include a cleared level platform of approximately 170 m by 80 m for connection of Wooderson Solar Farm. There will also be space for potential future expansion contained within a security fence. It will include switchgear to isolate circuits in an emergency, as well as devices to monitor and communicate the performance or circuits.	 Source: Cowell Electric, 2025
Easement and Access Tracks The transmission line will be located within a 60 m wide easement and vegetation clearing will be required in accordance with Powerlink guidelines to maintain safe electrical clearances. Existing access tracks will be utilised in the first instance. New access tracks will be refined as the detailed design of the Project progresses.	

Ongoing maintenance of access tracks will be required to ensure that vehicle access to structure sites is available for inspections and structure maintenance. The work will aim to minimise disturbance to natural groundcover, and in consultation with the appropriate authority and landowner.	 Source: Cowell Electric

4.1.3 Decommissioning and rehabilitation phase

At the end of the Wooderson Solar Farm's operational life, it is anticipated to either be upgraded (subject to additional planning approvals, as required) or decommissioned. The decommissioning of the solar farm would result in the OHTL being no longer required and will also be decommissioned. It is anticipated that switchyard would remain operational as a Powerlink network asset.

Decommissioning the OHTL will be in agreement with the landholders, and would involve removing infrastructure, returning the Project Area to its pre-existing land use as far as practicable, and easements maybe surrendered to the property owner. Some infrastructure such as access tracks may be retained where agreed with and beneficial to the landowner.

Where feasible and practical all dismantled and decommissioned infrastructure and equipment will be recycled. It is anticipated that more material would be recyclable by the end of the operational life than is currently possible, as recycling industries establish. Structures and equipment that cannot be recycled would be disposed of at an approved waste management facility in accordance with all statutory requirements.

Vehicle movements and personnel requirements during the decommissioning phase are expected to be similar or less than the construction phase.

5. Legislative context and standards

This section summarises the key planning policies and guidance that have been identified that inform this LVIA and/or indicate the potential sensitivity of the landscape to change.

The emphasis of this section is to identify those aspects of landscape or visual amenity that require assessment under legislation, particularly the requirements of the GRCPS against which the Project will be assessed. Visual impacts can occur across LGA boundaries. Therefore, as the Banana Shire Regional Council falls within the western part of the LVIA Study Area, albeit outside of the Project Area, the provisions of the BSPS have also been considered below, although the development will not be assessed against the BSPS.

The provisions of relevant guidelines and planning schemes at the local, state, regional and national level applicable to landscape and scenic amenity are summarised in **Table 11** to

Table 14.

5.1 National planning and legislative context

Assessment guidance for this LVIA has referred to national assessment standards, where applicable. The provisions of these national policy relevant to landscape and scenic amenity values are presented in **Table 11**.

Table 11: Review of key national policy and guidance relevant to LVIA

AS4970-2025: Protection of Trees on Development Sites
AS4970-2025: Protection of Trees on Development Sites (Standards Australia, 2025) provides guidance on the principles for protecting trees on land subject to development. Where development is to occur, the Standard provides guidance on how to decide which trees are appropriate for retention, and on the means of protecting those trees during construction work. This standard informs the Project mitigation measures.
4282:2023 – Control of the Obtrusive Effects of Outdoor Lighting
AS/NZS 4282:2023 Control of the obtrusive effects of outdoor lighting (Standards Australia, 2023) sets out guidelines for the control of the obtrusive effects of outdoor lighting and gives recommended limits for the relevant lighting parameters to contain these effects within tolerable levels. It refers to the potential effects of lighting systems on receptors including nearby residents and users of adjacent roads. It does not apply to road lighting or lighting systems that are of a cyclic or flashing nature. Lighting is not anticipated during construction, and minimal safety and security lighting will be employed at the perimeter as a deterrent, and at the switchyard for safety. It is therefore considered that this standard does not directly apply to the Project. However, the best practice measures outlined in the standard inform Project mitigation opportunities.

5.2 State planning and legislative context

At the State level, major energy infrastructure is considered within the *State Planning Policy 2017 (*Queensland Government, DILGP, 2017) and the CICSDA Development Scheme. The relevant provisions of these guidelines in relation to landscape and visual considerations are summarised in Table 12**.**

Table 12: Review of key State policy and guidance relevant to LVIA

State Planning Policy 2017
The *State Planning Policy 2017* (SPP) contains state interest policies for energy, water supply and liveable communities (Queensland Government, DILGP, 2017). The SPP state interest policies for major energy infrastructure recognises that: *(3) The development of major electricity infrastructure and bulk water supply infrastructure avoids or otherwise minimises adverse impacts on surrounding land uses and the natural environment.* The SPP state interest policy for liveable communities recognises: *3 (b) maintain or enhance important cultural landscapes and areas of high scenic amenity, including important views and vistas that contribute to natural and visual amenity.*
Callide Infrastructure Corridor State Development Area: Development Scheme
The CICSDA (SDIP, 2025) is a multi-user corridor that can accommodate up to eight underground gas pipelines. It runs between the Calliope Range and the western boundary of the Gladstone SDA in Central Queensland and was designed primarily for pipelines to transport coal seam gas to the liquefied natural gas plants on Curtis Island. The corridor is approximately 44 km long, and is generally 200 m wide with an instance where it is 840 m wide where the Project Area is located, and currently contains three active coal seam gas pipelines owned by Santos, APA and APLNG. The Project Area crosses 840 m of the CICSDA. **Objectives of the *Callide Infrastructure Corridor State Development Area: Development Scheme* (CICSDA Development Scheme) (DSDIP, 2012) include**: (2) Ensures the integrity and functionality of the CICSDA is maintained and protected from land uses and activities that may be incompatible with, or adversely affect, the continued use of the State development area for co-located underground pipelines (principally for the transportation of gas) of regional, state and national significance. (3) Protection of the CICSDA to ensure the land resource is effectively utilised and uses are appropriately sited such that infrastructure, and distances between infrastructure, does not consume land unnecessarily or compromise future use and ensures the long-term viability of infrastructure within the CICSDA. (4) Ensure the impacts of land use minimises operational impediments on existing infrastructure and surrounding uses and provides orderly development of infrastructure within the CICSDA. (5) Ensures that locations for infrastructure, other than gas transportation infrastructure, to intersect the CICSDA are minimised and rationalised. (6) Ensure the physical characteristics of land are considered in determining the suitability and location of land uses. The *Scheme 1 – Consistent Use table* confirms the following consistent uses of the CICSDA: **Column A:** Uses that are considered *highly likely to meet* the objectives of the CICSDA: animal husbandry and gas transportation infrastructure **Column B:** Uses that *may meet* the objectives of the CICSDA service infrastructure (which includes water distribution or reticulation, sewerage and stormwater drainage or telecommunications) **Column C:** Uses that are considered *likely to compromise* the objectives of the CICSDA: All other use not specified in Columns A and B. As the Project's infrastructure does not relate to Column A or B, Column C is relevant to the Project Area. Further details to address the Column C consistent use specification sit outside of this LVIA as Column C does not specifically consider issues relevant to consideration of landscape and visual impacts these are further discussed in the Planning Assessment Report.

5.3 Regional planning and legislative context

At a regional level, the Project Area falls within the *Central Queensland Regional Plan 2013* (CQRP) (Queensland Government, 2013). It is noted that the CQRP has been confirmed as being appropriately integrated into the GRCPS and BSPS. A review of key regional policy and guidance relevant to this LVIA from the CQRP is provided in **Table 13.**

Table 13: Review of key regional policy and guidance relevant to LVIA

Central Queensland Regional Plan 2013
The CQRP notes that electrical infrastructure is a priority outcome for the region, with opportunities to reinforce electricity generation and transmission/distribution systems where and when they are needed to service anticipated population and industry growth. The CQRP recognises that areas of high scenic or natural amenity are the region's most significant drawcard so managing potential tourism sector impacts on environmental values is necessary to ensure a long term sustainable tourism industry in the region, while also recognising that the region encompasses a variety of regional landscapes, including urban and rural holdings, agricultural production, resource and mine sites, and protected areas. There are no other specific references to protection rural amenity, rural character, visual amenity or landscape character or associated Desired Regional Outcomes (DROs).

5.4 Local planning and legislative context

Table 14: Review of key local policy and guidance relevant to LVIA

Gladstone Regional Council Planning Scheme – Our Place Our Plan 2025
The current *Gladstone Regional Planning Scheme - Our Place Our Plan 2025 Version 2.1* approved in December 2025 superseded the former *Gladstone Regional Planning Scheme - Our Place Our Plan 2017 Version 2* which commenced on the 3 July 2017 and included Major Amendment 1 and updates to align with the *Planning Act 2016*. Key provisions, relevant to the assessment, are described below.
Part 3 – Strategic framework
3.2 Strategic intent **3.7 Our environment and heritage** **3.7.1 Strategic outcomes** notes the following relevant outcomes: (2) Natural places including areas with national and state environmental significance are protected through appropriate planning and development practices. (3) Natural places and valuable features of our natural environment are linked through regional and local environmental corridors… (4) The region's identified scenic amenity values are protected from inappropriate development. (5) The environmental values and quality of the region's waters and waterways are protected. (10) Places of cultural heritage are conserved so that the unique cultural and historical identity and diversity of the Gladstone region can be appreciated and interpreted. (11) Development on or adjoining local heritage places preserves their heritage significance and complements their character. **3.7.2 Elements** sets out factors relating to sustainable management of the natural environment and resources. Relevant provisions include:

- Development minimises and mitigates environmental impacts on the region's natural environment and resources.
- Areas of high scenic and landscape values within the region are protected from inappropriate development or impacts upon their amenity, particularly in the areas of Mount Larcom, Tablelands, Boyne Valley, Boynedale, **Mount Alma**, southern localities such as Lowmead and Captain Creek and much of the natural coastal and riverine areas. (Our emphasis).

The entirety of the Project Area falls within the rural zone, as identified on GRC's online mapping site.

4.2.22 Rural zone code

The purpose of the rural zone code is to:

(b) Provide opportunities for non–rural uses that are compatible with agricultural and rural activities, and the landscape character of the rural area where they do not compromise the long–term use of the land for rural purposes

The purpose of the zone will be achieved through the following overall outcomes:

(i) Natural features such as creeks, gullies, waterways, wetlands and bushland are retained, managed and separated from adjacent development where possible.

(j) Rural land uses incorporate sustainable practices to prevent soil erosion, protect the quality of land resources and water catchments, and maintain habitat values of waterways and native timber and forest areas

Performance outcomes (PO)	Acceptable outcomes (AO)
Built form PO3 (if involving building work) Buildings are designed and located so as not to adversely impact the rural character and amenity of the locality.	**AO3.1** Buildings, other than a roadside stall, are setback a minimum of: (a) 10 m from the front and side boundaries for allotments greater than 2 ha.
Amenity PO7 Development does not adversely impact on the amenity of the surrounding rural or residential land uses or rural landscape character.	**AO7** Plant and air–conditioning equipment, storage areas and processing activities are screened from view of the road or adjoining residential uses.
Land Use P10 Development: (a) is consistent with the rural character of the locality (b) supports the primary rural function of the zone; and (c) protects rural, natural and scenic values of the locality.	No acceptable outcome is nominated.
Design and amenity PO14 Development does not unduly impact on the existing amenity and character of the locality having regard to: (a) the scale, siting and design of buildings and structures (b) visibility from roads and other public view points, screening vegetation and landscaping (c) the natural landform and avoidance of visual scarring.	No acceptable outcome is nominated.

Part 8 – Overlays

8.2 Overlay codes

8.2.11 Scenic Amenity

The planning scheme has a Scenic Amenity Overlay Map relating to visual amenity - *Planning Scheme Overlay – Scenic Amenities* (Gladstone Regional Council, n.d). **The Project Area does not contain any areas identified on the Scenic Amenities overlay map**. However, landscapes within the broader LVIA Study Area are identified as having scenic amenity value on the overlay mapping. This includes elevated and vegetated landscapes associated with the Calliope Range to the west of the Project Area that are noted as having areas ranging from district (7.5) to regional significance (8, 9 and 10) with regards to its scenic values (refer **Figure 4**). There are two ranges, the Boyne and Mount Alma Ranges located beyond the LVIA Study Area to the south and north respectively, which also have areas ranging for a district (7.5) to regional significance (8, 9 and 10). The provisions of the overlay code are included below to indicate factors that need to be considered within areas of high scenic amenity but do not apply directly to the Project Area.

8.2.11.2 Purpose

The purpose of the Scenic amenity overlay code is "*to ensure that development in areas of high scenic amenity is sited and designed to minimise adverse impacts on those scenic amenity values*."

8.2.11.3 Assessment benchmarks

Table 8.2.11.3.1—Accepted development subject to requirements and assessable development contains the following relevant overall outcomes:

Performance outcomes (PO)	**Acceptable outcomes (AO)**
Siting of development	
PO1 Any buildings or structures are sited to minimise the impact on the natural landscape and topographical features.	**AO1** Any buildings or structures are not located on ridgelines.
PO2 Development is visually integrated with the landscape elements to maintain or enhance the landscape and scenic amenity values.	No acceptable outcome is nominated. Note—The scenic amenity values of and visible from the land must be assessed and confirmed in a Scenic Amenity Assessment report prepared by a suitably qualified and experienced person. The report is to address strategies and design responses in order to demonstrate compliance with this performance criterion.
PO3 The building design: a) minimises visual impact and prevents buildings from dominating the natural landscape b) is compatible with the natural characteristics of the area, and c) avoids skyline intrusion.	No acceptable outcome is nominated.
PO4 Building colours and materials blend in with the natural landscape to soften the visual impact of buildings.	**AO4.1** Buildings utilize external finishes and colours that are of a low to moderate Light Reflectance Value (50% LRV or lower). **AO4.2** Development includes variations in wall and roof lines so as to minimise the appearance of building bulk. No external face of the building in a single continuous plane has a surface area of more than 100 square metres.

Visibility of development	
PO7 Development visible from identified significant viewer locations does not adversely impact upon significant views and landscape and scenic amenity values.	No acceptable outcome is nominated.

Banana Shire Planning Scheme 2021

In June 2021, Banana Shire Council resolved to adopt the new BSPS, which has been prepared in accordance with the *Planning Act 2016* (Queensland) (Banana Shire Council, 2026).

Part 2 – Strategic Framework

2.2 Strategic intent

Notes that "*The rural character of agricultural land, mining resources and natural areas is protected and maintained for their production, landscape and environmental values. Development enhances the rural sector and economy while ensuring that existing amenity, economic, landscape and environmental values are not compromised*."

In addition, it is the intent that "*Visually prominent landscapes retain their environmental, aesthetic and amenity values*."

2.4 Rural Areas

The Shire's rural areas support a diverse rural sector; cropping, grazing, intensive animal and horticultural industries; mining and resources activity and environmental and conservation areas. The resultant rural landscape is an intrinsic part of the Shire's character and is important in defining the urban areas of the Shire.

2.4.1 Strategic Outcomes notes the following relevant outcomes:

(9) Opportunities to develop renewable energy and allied industries are supported where:
- (a) It provides a secure green energy future such as wind, solar or other alternative power;
- (b) Long–term economic growth and employment benefits are demonstrated;
- (c) Significant natural and cultural areas are avoided; and
- (d) Impacts on sensitive uses are managed.

2.6 Natural Systems and hazards

Notes that "*the Banana Shire contains areas of national, state and local environmental significance that include Expedition, Isla Gorge, Kroombit Tops and Precipice National Parks, conservation parks and State forests, the forested Banana, Callide/Calliope, Dawson, Gilbert, Lynd and Murphy Ranges, lakes, wetlands, sub–artesian waters and the Dawson, Dee and Don River catchments. Protection and management of the natural environment, its biological diversity, ecological integrity, and natural assets is paramount in preserving both the natural and economic benefits. Effective management protects against the impacts of land degradation and pest invasion and provide long term benefits for the Shire's current and future populations. Communities conserve and prudently use areas valued for landscape and scenic amenity to meet their present needs without compromising the ability of future generations to meet their needs*."

2.6.1 Strategic Outcomes notes the following relevant outcomes:

(1) The natural environment and its assets, connectivity, ecological processes and biodiversity values are conserved, enhanced, restored and protected from incompatible development to avoid or otherwise minimise significant adverse impacts on their values.

(2) Development within or adjacent to an area of environmental significance minimises disturbance to the natural landform, ecology and wildlife habitats and contributes to ecosystem health, liveability and prosperity.

(3) Water resources such as those associated with the main river systems of the Dawson, Dee and Don Rivers and sub-artesian resources are managed and protected. Natural drainage, groundwater and landscape features are protected or enhanced.

Part 5 – Zones

Policy / Objective	Purpose / intent
As per BSPS 2021 Zoning Map, the part of the LVIA Study Area that falls within Banana Shire is predominantly zoned as Rural, whilst some areas of Environmental Management and Conservation and other land uses also occur.	**5.10.2 Rural Zone Code** The purpose of the Rural Zone Code includes: (b) provide for other uses and activities that are compatible with: (i) existing and future rural uses and activities; and (ii) the character and environmental features of the Zone; (c) maintain the capacity of rural land for rural uses and activities by protecting and managing significant natural resources and processes. The purpose of the Code will be achieved through the following overall outcomes: (b) development is sensitive and responsive to the rural character and scenic amenity and maintains vegetation cover in significant areas.
Rural Zone Code Table 5.10.3	
Performance Outcomes – Renewable energy facility	
Performance outcomes	**Performance outcomes** (Note: Acceptable Outcomes are not presented)
General – Built form	
PO1	Development maintains the rural character of the locality.
Banana Shire Landscape and Visual Impact Assessment Policy 2022	
This policy was adopted in April 2022 (Banana Shire Council, 2022). The purpose of this policy is to ensure that appropriate regard is given to the identification and mitigation of impacts from extensive developments on the landscape character and visual amenity of surrounding properties. The policy outlines a methodology for assessing landscape and visual impacts of large-scale greenfield projects informed by the Guidelines for Landscape and Visual Impact Assessment, Third Edition (GLVIA3) (The Landscape Institute and the Institute of Environmental Management and Assessment, UK, Routledge (Landscape Institute, 2013) and the AILA Queensland Guidance Note for Landscape and Visual Assessment (GNLVA) (Australian Institute of Landscape Architects, 2018). It is noted that both of these documents have informed the methodology of this LVIA.	

5.5 Summary of relevant legislative context and standards

A small section of the Project Area is located within CICSDA. This section is approximately 1 km in length and is comprised of 2 monopoles (with one additional monopole on the periphery of the area) and associated cabling.

As determined by the CICSDA Development Scheme *Schedule 1 – Consistent use table*, the Project Area's use:

- Does not fall within Column A, uses that are considered *highly likely to meet* the objectives of the CICSDA Development Scheme for animal husbandry or gas transportation infrastructure
- Does not fall within Column B, uses that *may meet* the objectives of the CICSDA for service infrastructure (water distribution or reticulation, sewerage and stormwater drainage or telecommunications)

- Falls within Column C, uses that are considered *likely to compromise* the objectives of CICSDA Development Scheme as all other uses not specified.

As the Project's infrastructure does not relate to Column A or B, Column C is relevant to the Project Area. Further details to address the Column C consistent use specification are addressed outside of this LVIA as these are planning considerations not directly relevant to landscape and visual amenity and have been discussed within the Planning Assessment Report.

The Project Area falls entirely within the GRC LGA, as shown in **Figure 1**. The GRCPS indicates that the Project Area is located within the Rural Zone as shown in **Figure 4**. The GRCPS contains a *Scenic Amenity Overlay Code* which intends to *"ensure that development in areas of high scenic amenity is sited and designed to minimise adverse impacts on those scenic amenity values*." The policy is intended to be applied to specific scenic landscape features and amenity considered to be sensitive to the visual impacts of development and contains advice for minimising development impacts on scenic landscape features and guidance for the preparation of visual impact assessment reports. Specific areas within the region have been identified to contain scenic amenity values ranging from district and regional significance.

None of the Project Area is identified to contain any areas of district or regional significance within the GRCPS *Planning Scheme Overlay – Scenic Amenities Map*. The broader LVIA Study Area contains areas of district and regional significance, range from 7.5 to 10 as shown in **Figure 4.** These areas of scenic amenity are elevated and vegetated landscapes associated with the Calliope Range to the west of the Project Area that are noted as having both district (7.5) and regional significance (8, 9 and 10). There are 2 ranges, the Boyne and Mount Alma Ranges, located beyond the LVIA Study Area to the south and north respectively, which also have areas ranging for a district (7.5) to regional significance (8, 9 and 10).

In addition, the GRCPS has identified elements of potential scenic value within the rural zone and LVIA Study Area which includes the following:

- natural features such as creeks, gullies, waterways, wetlands and bushland
- rural landscape character and amenity
- views, including from roads and residential areas.

The GRCPS also generally notes to avoid skyline intrusion and to avoid development on ridgelines. This LVIA has therefore considered whether these elements and features are found within the Project Area or across the wider LVIA Study Area.

The far western areas of the LVIA Study Area falls within the BSC, although not part of the Project Area are located within the LGA. As visual impacts can extend across LGA boundaries the BSPS was considered in recommendations and how these may relate to the Project Area. The BSPS includes the strategic intent that "*The rural character of agricultural land, mining resources and natural areas is protected and maintained for their production, landscape and environmental values. Development enhances the rural sector and economy while ensuring that existing amenity, economic, landscape and environmental values are not compromised*." and that "*Visually prominent landscapes retain their environmental, aesthetic and amenity values*."

Both the GRCPS and BSPS do not include any specific recommendations relating to OHTL's role in connecting renewable energy projects, and both planning schemes' guidelines relating to OHTL do not broadly relate to the nature of the Project Area.

Section 12: Response to planning requirements provides an assessment of the Project against the relevant policies concerning landscape and visual amenity at a state and LGA level.

6. Existing environment

6.1 Regional landscape context

The Project Area and its wider landscape context are illustrated in **Figure 1, Figure 2a, Figure 2b** and **Figure 3** included in **Appendix 1**.

6.1.1. Settlement and infrastructure

The Project Area is situated in a predominantly rural area comprising isolated farmsteads, cleared areas used for grazing, and surrounded by forested and natural landscapes typically situated on elevated landscapes which includes the Calliope Range.

The region includes the 2 rural settlements of Mount Alma and Dumgree, however, is relatively undeveloped, typically supporting large rural land holdings with isolated farmsteads.

The populations of these rural localities are largely remote and the likely number of residents and/or viewers in the locality (State Suburbs and Localities) is as follows (ABS, 2021):

- Mount Alma – 59 people
- Dumgree – 63 people

Larger settlements outside the LVIA Study Area have not been included in the assessment as the Project Area is considered unlikely to be visible from these more distant locations. The closest town to the Project Area is Calliope which is located approximately 30 km north-east of the Project Area and lies outside of the LVIA Study Area on the Dawson Highway.

Roads in and around the LVIA Study Area provide access and provide opportunities for travellers to view landscapes across the region. These roads are typically local. However, the Dawson Highway traverses east to west through the LVIA Study Area. The Dawson Highway connects Gladstone and Biloela to western areas of Queensland. Annual Average Daily Traffic (AADT) for the Dawson Highway is 4,601 (19.58% of which are heavy vehicles) for the section between Gladstone and Biloela (Queensland Government, 2025).

Other key local roads include Duck Holes Road, Fig Tree Road and Mount Alma Road. There are no identified scenic or tourist routes within the LVIA Study Area.

As shown on **Figure 2a** and **Figure 2b**, several smaller local roads are present within the LVIA Study Area, some of which border or are within the Project Area.

The *Bicentennial National Trail*, a long-distance multi-use route for hikers, cyclists and horse riders, traverses the LVIA Study Area, following Fig Tree Road, Duck Holes Road and the Dawson Highway (All Trails, 2025).

The Moura System Railway traverses the LVIA Study Area, generally following the alignment of the Dawson Highway and is part of the Aurizon Network Pty Ltd rail network (Aurizon, 2017). This freight railway services the industrial and rural communities of the Dawson and Callide Valleys in Central Queensland, and does not provide passenger services.

There is generally little built infrastructure within the Project Area and LVIA Study Area, with the exception of 2 existing OHTLs. The 132 kV Gladstone South to Callide Power Station OHTL is located south of the Project Area, and the 275 kV Calvae to Wurdong OHTL crosses the western part of the Project Area.

6.1.2. Interim Biogeographic Regionalisation for Australia

The IBRA is a biogeographic regionalisation of Australia developed by the Australian Government's Department of Sustainability, Environment, Water, Population and Communities (now the Department of Climate Change, Energy, the Environment and Water [DCCEEW]) and represents a landscape–based approach to classifying the land surface of Australia. The IBRA data consists of two datasets: IBRA bioregions, which are a larger scale regional classification of homogenous ecosystems; and subregions, which are more localised.

Whilst bioregions have been defined mainly for the purposes of ecosystem planning and monitoring, the nominal attributes that make up IBRA are climate, lithology and/or geology, landform, vegetation, flora and fauna, and land use, which are themes typically used to define landscape character at a high level. IBRA 7.0 was released in 2012, which delineates 89 biogeographic regions and 419 sub regions, each reflecting a unifying set of major environmental influences which shape the occurrence of flora and fauna and their interaction with the physical environment across Australia. The bioregion information enables a high–level desktop understanding of the different landscape settings of the LVIA Study Area. The descriptions for the sub–regions that accompany IBRA 7.0 are not currently published. However, upon request, the Queensland Government Environmental Resources Information Network (ERIN) were able to supply descriptions of each of the subregions in the LVIA Study Area for the IBRA 5.1 dataset.

As defined by IBRA 7.1 (DCCEEW, 2025), the LVIA Study Area is located within the Brigalow Belt South (BBS) bioregion, the Mount Morgan Ranges (BBS04) subregion.

Descriptions for the subregion is provided in **Table 15** (ERIN, 2012).

Table 15: IBRA subregion descriptions

IBRA subregion name, code and total area (ha)	Description
Mount Morgan Ranges BBS04 1,293,528 ha	Mount Morgan Ranges is a rugged to hilly province formed on the Palaeozoic rocks of the coastal ranges from inland of Rockhampton extending south to the Eidsvold area. The dominant rocks are volcanics, with areas of igneous rocks and small areas of folded metasediments. The steeper areas are dominated by narrow-leaved ironbark (*Eucalyptus crebra*) woodlands with red bloodwood (*Corymbia erythrophloia*), spotted gum (*C. citriodora*) and rosewood (*Acacia rhodoxylon*). Silver-leaved ironbark (*Eucalyptus melanophloia*) forms a woodland on erosional lower slopes and gum-topped box (*E. moluccana*) forms a woodland on colluvial slopes. Forest red gum (*Eucalyptus tereticornis*) and Moreton Bay ash (*Corymbia tessellaris*) occur on alluvial soils.

Note: these descriptions were provided directly to a LatStudios staff member by the Queensland Government Environmental Resources Information Network (personal correspondence).

6.1.3. Soils, vegetation and rural land use

Existing land use within the LVIA Study Area is predominantly rural, characterised by grazing on native vegetation with smaller occurrences of production forestry, other minimal use, cropping and plantation forestry (DAFF, 2024).

To facilitate these land uses, historical clearing within lower lying parts of the LVIA Study Area suitable for agricultural land uses has occurred. As such, remnant vegetation is limited to smaller areas of eucalyptus dominated habitats, whilst large areas have regrown since initial clearing.

Steeper elevated and forested parts of the LVIA Study Area support nature conservation and other minimal uses. These areas support large areas of remnant eucalyptus dominated vegetation, as well as smaller areas of closed forests.

There are no National Parks within the LVIA Study Area. The closest National Park, Kroombit Tops National Park, is located 13.6 km south of the Project Area outside of the LVIA Study Area. It is noted that Kroombit Tops National Park includes a 4WD track and lookout, however, as these are located outside of the LVIA Study Area significant views are not anticipated to be possible so they have not been considered within this LVIA.

There is one State forest within the LVIA Study Area, the Calliope Range State Forest, and three State forests outside of the LVIA Study Area including Don River State Forest, Maxwelton State Forest and Dan Dan State Fores which are managed under the *Forestry Act 1959* (Queensland). As there is limited publicly available information on these areas, it is assumed that access for recreation is limited and few viewers would be present.

Soils across the LVIA Study Area are broadly chromosol alluvial plains and gentle rises associated with the Calliope River and minor watercourses, along with granitic tenosols, sedimentary dermosols and volcanic soils of rudosols and sodosols located in the elevated areas close to the western, southern and northern boundaries of the LVIA Study Area (State of Queensland, 2025).

6.1.4. Geology, landform and hydrology

As illustrated on **Figure 5,** landform within the LVIA Study Area is varied, and broadly characterised by gently undulating to steep, generally forested landscapes associated with the Calliope Range surrounded the lower lying, flat to gently undulating plains associated with the Calliope River and its tributaries. Mountains located within the broader LVIA Study Area include:

- Blackfellow Mountain (562 m Australian Height Datum [AHD])
- Fig Tree Hill (299 m AHD)
- Mount Grim (229 m AHD)
- Mount Harper (238 m AHD)
- Mount Redshirt (597 m AHD)
- Rocky Point Mountain (563 m AHD)
- Round Mountain (478 m AHD)
- The Mole Hill (203 m AHD).

The LVIA Study Area and the Project Area falls within the Calliope drainage basin and Calliope River drainage basin sub–area. The major watercourse within the LVIA Study Area is the Calliope River. This river is fed by several larger creeks, some of which intersect the Project Area including Running Creek, Doubtful Creek, Duck Holes Creek, Lost Spring Creek, Maxwelton Creek and their numerous tributaries. Other major creeks within the broader LVIA Study Area includes Branch Creek, Harper Creek, Toms Creek and Oaky Creek.

The LVIA Study Area consists of a complex and highly varied surface geology with alluvial flood plains consisting of clay, sand, silt and gravel typically associated with major watercourses such as the Calliope River. The Calliope Range is an elevated landscape within the LVIA Study Area consisting of granite, volcanic sandstone, mudstone and rare basaltic pillow lava.

6.2. Description of the Project Area

The Project Area is shown on **Figure 2a** and **Figure 2b**. The Project will be situated within the bounds of the Project Area, which is comprised of freehold allotments, Dawson Highway Road Reserve, Duck Holes Road Reserve and 2 unnamed road reserves.

As illustrated on **Figure 5**, the Project Area comprises gentle rises, which are found across the broader central and eastern parts of the LVIA Study Area, and feature flat to gently inclined plains and rises associated with the Calliope River and its tributaries.

The *Bicentennial National Trail*, a long-distance multi-use route for hikers, cyclists and horse riders, passes through the Project Area on the Dawson Highway (All Trails, 2025).

There are no mountains located within the Project Area, although the mountains in the wider LVIA Study Area as described above create a backdrop to the Project Area.

The Project Area contains a surface geology of alluvial flood plains with large areas of deeply weathered grey granodiorite.

Minor ephemeral creeks within the Project Area include Running Creek, Doubtful Creek, Duck Holes Creek, Lost Spring Creek, Maxwelton Creek and their numerous tributaries which flow toward the Calliope River.

Historical clearing of vegetation within the Project Area and current vegetation cover corresponds strongly with the topography of the Project Area. More elevated parts of the Project Area support remnant eucalypt woodlands, open forests and rainforest and scrub. Lower lying areas and more gently rolling areas are extensively cleared or support regrowth vegetation and smaller pockets of remnant acacia dominated open forests, woodlands and shrublands.

There are limited built structures within the Project Area, and are primarily rural fences, associated access roads and farming infrastructure. The existing 275 kV Calvale to Wurdong OHTL passes through the Project Area. Examples of typical existing infrastructure within the Project Area are provided in **Illustration 2**.

The Moura System Railway Line passes 59 m to the north of the western end of the Project Area.

The western part of the Project Area is located to the north of the Dawson Highway, before crossing the Dawson Highway, before the Project extends south of the Dawson Highway in the eastern part of the Project Area. Aside from this instance, it is noted that the Project Area only crosses private access tracks. Duck Holes Road is an additional public road within the LVIA Study Area and is located immediately to the north of the Project Area.

The broader Project Area (outside of the Dawson Highway) is not readily accessible to the public and is currently used for cattle grazing. Outside of the Disturbance Footprint, the land will continue to be used for rural purposes including grazing livestock.

A small section of the CICSDA with its underground gas pipelines passes through the Project Area. The physical character of this section CICSDA is rural, is used for grazing, is comprised of low grasses and regrowth vegetation and includes some privately used access tracks.

Illustration 2: Existing features of the Project Area





7. Landscape assessment

7.1. Landscape character baseline

Five LCTs have been identified within the LVIA Study Area. These LCTs are further broken down into geographically distinct areas, LCAs, which can be identified in various locations within the LVIA Study Area. These are identified in **Figure 6** (refer **Appendix 1**):

- LCT A: Forested Ranges and Mountains
- LCT B: Undulating and Grazed Uplands
- LCT C: Lowland Rural Plains
- LCT D: Forested Lowlands
- LCT E: Vegetated Major Watercourses.

7.2. Landscape character assessment

The majority of the Project Area falls within LCT C with some areas of LCT B and LCT D present. Both LCT C and LCT B are directly impacted by proposed Project infrastructure, and LCT D has a small part impacted by the Project's access tracks. A summary of the potential impact of the Project Area on these LCTs and their associated LCAs within the LVIA Study Area is provided in **Section 7.2.2** and **Section 7.2.1.**

With regards to scenic values within the LVIA Study Area, LCT A contains areas of mapped scenic amenity as defined in the GRCPS *Planning Scheme Overlay – Scenic Amenities Map (*Gladstone Regional Council, n.d). These areas are typically associated with the Calliope Range. LCT B and LCT C do not contain mapped areas identified as having regional or district scenic amenity value within the GRCPS*,* the LCTs are associated with a strong rural landscape character that is noted in both the GRCPS and BSPS. No areas of mapped scenic amenity (as identified by the GRCPS) associated with LCT D fall within the Project Area, and LCT D contains small areas of MSES high ecological significance wetlands, noting wetlands have been identified as containing areas of scenic amenity by the GRCPS.

LCT A is not anticipated to experience any direct impacts due to the Project, and any impacts on the landscape character of this LCT would be indirect and limited due to the distance of this LCT from the Project. Whilst LCT A does contain landscapes identified as having mapped regional and district scenic value in the GRCPS, due to the distance of this LCT from the Project Area it is considered that indirect impacts on the character of this LCT will not be experienced from valued landscapes, and therefore, impacts would be negligible. Similarly, LCT E is anticipated to only experience indirect impacts over a small area arising from visual impacts on landscape character. Therefore, LCT B, LCT C and LCT D are assessed in more detail in **Table 16**, **Table 17** and **Table 18.**

7.2.1. Landscape Character Type B

Table 16: Likely impact of the Project on LCT B: Undulating and Grazed Uplands

Type B: Undulating and Grazed Uplands	
Landscape Baseline Assessment	
Location and boundaries	This LCT is predominantly located in lower lying areas of the LVIA Study Area with gradual undulations and topography gradually sloping toward forested ranges nearby. Occurrences of this LCT are found in the central LVIA Study Area, and in proximity to forested ranges in the north, west and southeast of the LVIA Study Area. There are 5 LCAs of this LCT in the LVIA Study Area: • LCA B1: Harper Undulating and Grazed Uplands • LCA B2: Rockfield Undulating and Grazed Uplands • LCA B3: Budjeri Undulating and Grazed Uplands • LCA B4: Thompsons Undulating and Grazed Uplands • LCA B5: Redshirt Undulating and Grazed Uplands Of these, only LCA B2: *Rockfield Undulating and Grazed Uplands* is impacted by the Project and assessed in detail.
Typical character images:	
     	
Key characteristics	• The majority of the geology within LCT B is granitoid rock, along with a smaller section of mixed volcanic and sedimentary rock in the north of the LVIA Study Area. • Dominant soil types found within LCT B are typically chromosols, dermosols and sodosols. • Landform is flat to generally undulating, incised by several creeks or located over floodplains. • Vegetation within this LCT is characterised by *Eucalyptus sp.* on dry woodlands to open woodlands on sandplains or depositional plains. • Contains rural localities with Mount Alma and Dumgree that support limited scattered isolated rural residential homesteads. • The vegetation within this typically grasses, clumped or sparse trees to vegetated blocks or shelterbelts. • This LCT is typically flat with gentle to more gradual undulations.

Existing modifications to and infrastructure elements in the LCT	• Infrastructure within this LCT includes: ○ the major road corridor of the Dawson Highway and the Moura System Railway within B2 and B4 ○ two existing transmission lines (275 kV and 132 kV) which traverse sections of B1 and B2, as well as other low voltage overhead powerlines ○ underground pipelines of the CICSDA pass through LCA B1 and LCA B2. • Development relating to renewable energy projects is taking place in this LCT. • Existing built elements predominantly consist of local and rural road infrastructure and scattered rural dwellings. • Clearing of vegetation typically aligns to the transmission line and road alignments, areas that are dominated by grazing on native vegetation.
Landscape character sensitivity assessment	• Areas within LCA B1 have been identified as containing areas of mapped areas of scenic amenity within the GRCPS. However, this LCA is not impacted by the Project. • Areas of unmapped areas of scenic amenity within the GRCPS are found within this LCT. This includes landscape characteristics within the region identified to be valued within the GRCPS that include: ○ riverine areas, creeks, gullies, waterways and bushland ○ rural landscape character • A low degree of perceived naturalness with evidence of human uses and modification of the landscape. • Traversed by the *Bicentennial National Trail*. • Parts of this LCT are visually closed, with sparse clumping of mature trees which have generally been left following vegetation thinning and clearing for agricultural purposes. • While this LCT includes areas of landscape value identified by the GRCPS, this landscape character is highly modified by human clearing and existing large scale energy infrastructure.
Landscape character sensitivity	• Up to ***Low.***
Landscape Evaluation	
Magnitude of change assessment	• A small section of the Project, which includes 5 OHTL monopoles and the switchyard may directly impact LCA B2, providing a noticeable change in character. The Project will not fundamentally change the character of the landscape due to the presence of existing large scale OHTL infrastructure located within this landscape.
Magnitude of change	• ***Low (direct).***
Significance of impact	• ***Minor*** and therefore ***Not Significant.***

7.2.2. Landscape Character Type C

Table 17: Likely impact of the Project on LCT C: Lowland Rural plains

Type C: Lowland Rural plains	
Landscape Baseline Assessment	
Location and boundaries	This landscape is located across the LVIA Study Area and includes flat to gently inclined plains adjacent to major watercourses and creeks. There are 3 LCAs of this type in the LVIA Study Area: • LCA C1: West Mount Alma Lowland Rural Plains • LCA C2: North Mount Alma Lowland Rural Plains • LCA C3: Fig Tree Road Lowland Rural Plains *LCA C1: West Mount Alma Lowland Rural Plains* is found within the Project Area and is only assessed in detail.
Typical character images:	
     	
Key characteristics	• Surface geology varies throughout this LCT and corresponds generally with the underlying solid geology and is dominated by granite, mudstone and limestone sedimentary rock. • Located within the Project Area, specifically LCA C1: *West Mount Alma Lowland Rural Plains.* • Soils vary considerably throughout this LCT, with lower lying areas dominated by sodosols and more elevated locations of this LCT which typically contain rudosols. • Landform is generally flat to gently sloping and is typically between 40 m and 130 m AHD, with higher elevations occurring in areas where plains extend into creek valleys. • Land use throughout this LCT is primarily dominated by grazing on native pastures. • Irrigated areas are generally situated immediately adjacent to or in close proximity to the Calliope River or its tributaries. • This LCT contains the lower parts of ephemeral and permanent waterways that are tributaries of major watercourses such as the Calliope River. Riparian vegetation has generally been cleared and is limited to a relatively narrow channel along the watercourse.

Type C: Lowland Rural plains	
	• There has been significant vegetation clearing within this LCT to facilitate rural land uses, with remnant vegetation limited to *Eucalypt* spp. open woodlands on floodplains, and isolated pockets of acacia-dominated shrublands. • Some limited regrowth vegetation and other stands of vegetation are present along road corridors. • Contains rural localities within Mount Alma that support limited scattered isolated rural residential homesteads. • Broad open views are generally possible across this LCT and are generally unimpeded, due to its flat to gently sloping topography and extensive historic clearing that has occurred in the landscape. However, there are localised areas where vegetation and/or subtle variations in topography obstructs views, such as along creek and road corridors.
Existing modifications to and infrastructure elements in the LCT	• Infrastructure within this LCT includes: o two existing transmission lines (275 kV and 132 kV) that pass through LCA C1, LCA C2 and LCA C3 o the major road corridor of the Dawson Highway passes through LCA C1 o the Moura System Railway passes through LCA C1 o underground pipelines of the CICSDA pass through LCA C1 and LCA C2. • Historical clearing for grazing is a key modification that has shaped (and indeed led to the establishment of) this LCT.
Landscape character sensitivity assessment	• Generally there is a low degree of perceived naturalness, with the exception of areas containing remnant vegetation, such as areas adjacent to major watercourses. • Highly rural, with the exception of areas in proximity to major roads. • This LCT contains landscape elements noted as contributing to amenity in the GRCPS, including: o creeks, gullies, waterways and bushland o rural landscape character • Traversed by the *Bicentennial National Trail*. • It is considered that the existing OHTL within this character type reduce the sensitivity of the landscape. • Overall, it is considered that whilst this LCT contains some areas acknowledged for their scenic qualities (which are formalised by local planning scheme provisions), much of this landscape is highly modified and devoid of highly unique or distinguishing landscape features. Whilst it is acknowledged that this is a large scale landscape, based on the above values coupled with the open, flat and expansive nature of the landscape, the presence of existing OHTL reduces the sensitivity of the landscape.
Landscape character sensitivity	• ***Low***
Landscape Evaluation	
Magnitude of change assessment	• LCA C1 is typically associated with the low-lying areas surrounding the Calliope River that fall within the Project Area. • Project infrastructure includes steel and/or concrete monopole OHTL towers and monopole pad benching are located within LCA C1 and are therefore anticipated to directly impact this LCT. • Within LCA C1, the magnitude of change is anticipated to be barely perceptible due to the following factors: o Existing OHTL infrastructure is currently located within LCA C1 and C2.

Type C: Lowland Rural plains	
	○ The introduction of additional OHTL infrastructure within LCA C1 within what is currently a relatively intact landscape consisting of a strong rural character is not unusual or new for the existing landscape. ○ Potential changes to the landscape from the introduction of additional OHTL is over a relatively restricted area within LCA C1. • Whilst it is anticipated that the direct influence of the Project infrastructure would represent an evident change in a relatively restricted area, the existing OHTL occurs within this LCT to generally reduce the sensitivity of LCA C1. The Project will present a noticeable change as it crosses the Dawson Highway, but aside from this, impacts are limited to a relatively small area of LCA C1 that is already impacted by existing OHTL infrastructure.
Magnitude of change	• ***Low.***
Significance of impact	• ***Minor*** and therefore ***Not Significant.***

7.2.3. Landscape Character Type D

Table 18: Likely impact of the Project on LCT C: Forested Lowlands

Type D: Forested Lowlands	
Landscape Baseline Assessment	
Location and boundaries	This LCT is predominantly located in low lying areas of the LVIA Study Area with occurrences in central catchment areas associated with watercourses and remnant vegetation. There are 5 LCAs of this LCT in the LVIA Study Area: • LCA D1: Moura Forested Lowlands • LCA D2: Toms Forested Lowlands • LCA D3: Doubtful Forested Lowlands • LCA D4: Alma Forested Lowlands • LCA D5: Station Forested Lowlands Of these, *LCA D1: Moura Forested Lowlands* and *LCA D3: Doubtful Forested Lowlands* are potentially impacted by the Project Area and assessed in detail.
Typical character images:	
  	

Type D: Forested Lowlands	
  	
Key characteristics	• The geology within LCT D is the Galloway Plains igneous complex. • Dominant soil types found within LCT D are typically chromosol. • Landform is generally undulating, incised by several creeks or located over floodplains. • Vegetation within this LCT is characterised by woodlands of *Corymbia sp*. and *Eucalyptus sp.* • The vegetation within this typically forested LCT is comparably much denser than other LCTs within the context of the LVIA Study Area and has a more natural aesthetic than many other rural areas nearby.
Existing modifications to and infrastructure elements in the LCT	• There is some infrastructure within this LCT including major road corridors such as the Dawson Highway within D1 and D3, the Moura System Railway passes through D1 and D3, and existing 275 kV and 132 kV transmission lines which traverse sections of D2, D4, D5. • Existing built elements predominantly consist of local and rural road infrastructure and scattered rural dwellings. • Clearing of vegetation typically aligns to the transmission line and road alignments, areas that are dominated by grazing on native vegetation.
Landscape character sensitivity assessment	• Landscape characteristics within the region identified to be valued within the GRCPS include: ○ riverine areas, creeks, gullies, waterways, wetlands and bushland ○ rural landscape character • Generally, a moderate degree of perceived naturalness, remoteness and inaccessibility, with little evidence of human uses and modification of the landscape. • Parts of this LCT are visually enclosed due to the presence of vegetation. • LCA D2 contains areas of MSES Wetlands of high ecological significance which may be considered to have some scenic qualities. • This LCT includes areas of landscape value identified by the GRCPS, specifically containing bushland, creeks, gullies, wetlands and areas of rural character of significance which contribute to the character and scenic amenity of the region, the overall inherent sensitivity is considered to be up to ***Medium***.
Landscape character sensitivity	• ***Medium***
Landscape Evaluation	
Magnitude of change assessment	• A small portion of the Project Disturbance Footprint, predominately associated with the presence of access tracks directly impacts LCA D1 and D3. This would create a barely noticeable change in character within a highly natural landscape but over a highly restricted and localised area within the LCA.

Type D: Forested Lowlands	
Magnitude of change	• ***Negligible.***
Significance of impact	• ***Minor*** and therefore ***Not Significant.***

7.3. Summary of landscape impact assessment

Whilst there are areas identified as containing district and regional scenic value by the GRCPS *Planning Scheme Overlay – Scenic Amenities Map*, within the LVIA Study Area these areas are typically associated with LCT A: Forested Ranges and Mountains and small areas of *LCT B: Undulating and Grazed Uplands* that are not directly impacted by the Project. Any landscape impacts caused by the Project Area on these areas will be indirect and negligible. *LCT D: Forested Lowlands* does not include any mapped areas of scenic value.

Areas of potential scenic value are identified within LCT A, as they contain elevated and vegetated landscapes, National Parks and State forests. The Project does not directly impact this LCT or identified areas of unmapped or mapped scenic value and any possible impacts will be indirect.

The GRCPS identifies riverine areas, creeks, gullies, waterways, wetlands, bushland and landscapes with rural character as highly valued by the community for their scenic amenity and their strong contribution to character, identity and sense of place and defines these as unmapped scenic amenity areas. Some of these attributes have been identified within both *LCT C: Lowland Rural Plains* and *LCT D: Forested Lowlands*.

The BSPS does not have any scenic amenity overlay mapping, however areas of potential scenic value have also been identified within LCT A, as they contain elevated and vegetated landscapes, National Parks and State forests. The Project does not directly impact this LCT or identified areas of unmapped or mapped scenic value and any possible impacts will be indirect.

Scenic landscape elements within the LVIA Study Area identified within the GRCPS (See **Section 5: Legislative context and standards**) have been considered within the assessment of sensitivity ratings in the landscape character assessment, where applicable.

Based on the landscape character assessment described in **Section 7.2: Landscape character assessment** as shown on **Figure 6**, a summary of the baseline analysis and overall likely landscape impact anticipated during the operation of the Project is provided for each LCT (and relevant associated LCAs) in **Table 19.**

Table 19: Summary of judgement of impacts on landscape character during operation

Landscape Character Type/Areas (LCT/LCA)		Landscape Sensitivity	Magnitude of change	Potential Landscape Impact	Significance of Impact
LCT A: Forested Ranges and Mountains	**No direct impacts on LCT A – indirect impacts only (Not Significant)**				
LCT B: Undulating and Grazed Uplands	LCA B1	Low	No Impact	No Impact	**No Impact**
	LCA B2: Rockfield Undulating and Grazed Uplands	Low	Low	Minor	**Not Significant**
	LCA B3-10	Low	No Impact	No Impact	**No Impact**
LCT C: Lowland Rural Plains	LCA C1	Low	No Impact	No Impact	**No Impact**
	LCA C2: North Mount Alma Lowland Rural Plains	Low	Low	Minor	**Not Significant**
	LCA C3-9	Low	No Impact	No Impact	**No Impact**
LCT D: Forested Lowlands	LCA D1: Moura Forested Lowlands	Medium	Negligible	Minor	**Not Significant**
	LCA D2	Medium	No Impact	No Impact	**No Impact**
	LCA D3: Doubtful Forested Lowlands	Medium	Negligible	Minor	**Not Significant**
	LCA D4-5	Medium	No Impact	No Impact	**No Impact**
LCT E: Vegetated Major Watercourses	**No direct impacts on LCT E – indirect impacts only (Not Significant)**				

The Project Area contains landscapes within *LCT B: Undulating and Grazed Uplands* (LCA B2), *LCT C: Lowland Rural Plains* (LCA C2) and *LCT D: Forested Lowlands* (LCA D1 and D3).

LCT B includes flat to undulating native pastures and grazing land that has been cleared for agricultural uses. A part of this LCT have mapped areas of scenic amenity within the GRCPS associated with the Calliope Range, with unmapped scenic amenity relating to a strong sense of rural character and creeks and tributaries associated with the Calliope River.

LCT C is dominated by native pastures and grazing land that has been cleared for agricultural uses with small occurrences of irrigated cropping and intensive animal husbandry. Parts of this LCT include creeks and tributaries associated with the Calliope River and consist of a generally strong rural character, which are identified as containing scenic landscape features within the GRCPS.

LCT D is gently undulating with several creeks or located over floodplains, and is typically forested with a much more natural aesthetic than many other rural aeras nearby. While this LCT does not include mapped areas of scenic amenity within the GRCPS, it contains unmapped scenic amenity relating to a strong sense of rural landscape character and natural features such as riverine areas, creeks, gullies, waterways and bushland.

The landscape impact assessment has concluded that there would be:

- Direct **Minor**, **Not Significant** impacts on LCT B (LCA B2: *Rockfield Undulating and Grazed Uplands*) due to the noticeable change the Project is anticipated to have on a very localised part of this LCT. The Project Area is not included within areas of unmapped scenic amenity value.

- Direct **Minor**, **Not Significant** impacts on LCT C (LCA C2: *North Mount Alma Lowland Rural Plains*) due to the noticeable impact of the proposed OHTL infrastructure within a rural area that features existing OHTL infrastructure. The Project will be directly noticeable as it crosses the Dawson Highway, but aside from this, changes within the Project Area may be visible within the rural landscape in cleared areas and in relation to the existing grazed lowlands. The Project Area is not included within areas of unmapped scenic amenity value.
- Direct **Minor**, **Not Significant** impacts on LCT D (LCA D1: *Moura Forested Lowlands* and *LCA: D3 Doubtful Forested Lowlands*) due to barely noticeable impact with access tracks and general site disturbance proposed within a small part of the rural area. The Project may be visible within the rural landscape in cleared areas and in relation to the existing forested lowlands. The Project Area is included within areas of unmapped scenic amenity value associated with its bushland.
- No significant impacts have been identified on LCTs A or E.

No nationally significant landscapes would be directly affected by the Project, and any impacts on National Parks recognised for their scenic landscape values and natural settings would be limited to indirect effects associated with the influence of the Project on the setting of these landscapes. Landscapes within the LVIA Study Area that are associated with regional and district scenic value are typically associated with the Calliope Ranges. The Project does not directly impact and is located at distance from the significant scenic area identified within the GRCPS *Planning Scheme Overlay – Scenic Amenity Map*. These distant indirect impacts are considered to be ***Not Significant***.

8. Visual assessment

8.1. Visual audiences and viewpoint selection

The visual baseline has been assessed and is described in terms of potential for views to be obtained by selected visual audiences within the LVIA Study Area. It is considered that the viewers (visual receptors) who have the potential to experience views of the Project are likely to include:

- Residents living in isolated rural residential properties surrounding the Project Area, including the rural localities of Mount Alma and Dumgree.
- Agricultural workers in the countryside including farmers.
- Travellers using major and minor roads within the LVIA Study Area, including motorists on Dawson Highway, as well as other local roads.
- Tourists passing through the LVIA Study Area by vehicle.

Based on an analysis of the types of visual audiences and visual receptors likely to be affected by the Project, and the findings of the field investigation, 7 viewpoints have been selected for detailed assessment. The location of representative viewpoints are shown on **Figure 7** and the views obtained (including the extent of the Horizontal Field of View [HoV] and other technical parameters for each) are shown on **Figure 8** to **existing view** (≈ 115° HFoV)

Figure 19 (**Appendix 2**) and summarised in **Table 20.**

These viewpoints are considered to be representative of the receptors noted above with the potential to be impacted by the Project. These viewpoints are proposed to include representation of greatest impacts of the Project because they capture locations where the most receptors are likely to be present and are taken, wherever possible, from areas with relatively open views towards the Project Area.

Table 20: Representative viewpoints selection

Code	Description	Visual Audience
VP1	Viewpoint 1: Northwesterly view from Dawson Highway at intersection of Rockford Road	Represents typical prolonged views to the Project Area experienced by isolated rural residents and nearby rural workers. Also representative of transient view of motorists along the Dawson Highway.
VP2a	Viewpoint 2a: Easterly view from Voewood Property gate – existing view (≈ 65° HFoV)	Represents typical prolonged views to the Project Area experienced by isolated rural residents and rural workers of Voewood Property (associated with Project). Also representative of transient view of motorists along the Dawson Highway.
VP2b	Viewpoint 2b: Westerly view from Dawson Highway near Voewood Property – existing view (≈ 170° HFoV)	Represents typical prolonged views to the Project Area experienced by isolated rural residents and rural workers of Voewood Property (associated with Project). Also representative of transient view of motorists along the Dawson Highway, in a section of the Project Area where the OHTL corridor crosses the Dawson Highway.
VP3	Viewpoint 3: Westerly view from Dawson Highway – existing view and visualisation (≈ 170° HFoV)	Represents typical transient views to the Project Area experienced by westbound motorists on the Dawson Highway.
VP4	Viewpoint 4: Southwesterly view from Duck Holes Road – existing view (≈ 170° HFoV and ≈ 85° HFoV)	Represents typical transient views west towards the Project Area experienced by local motorists on Duck Holes Road.

Code	Description	Visual Audience
VP5	Viewpoint 5: Southerly view from Fig Tree Toad – existing view (≈ 150° HFoV)	Represents typical transient views to the Project Area experienced by motorists and rural workers on Fig Tree Road. Also representative of prolonged views experienced by nearby isolated rural residents from their dwellings and properties on Fig Tree Road.
VP6	Viewpoint 6: Southeasterly view from Fig Tree Road – existing view (≈ 115° HFoV)	Represents typical transient views to the Project Area experienced by motorists and rural workers on Fig Tree Road. Also representative of prolonged views experienced by nearby isolated rural residents from their dwellings and properties on Fig Tree Road.
VP7	Viewpoint 7: Easterly view from Dawson Highway – existing view (≈ 150° HFoV)	Represents typical transient views to the Project Area experienced by motorists on the Dawson Highway.

8.1.1. Residential viewers in rural residential areas and settlements

Key settlements, towns and areas supporting rural residential living within the LVIA Study Area are described in **Section 6.1.1: Settlement and infrastructure**. Key visual impacts within the LVIA Study Area on these locations are anticipated to be associated with views obtained by those dispersed rural residential receptors located closest to the Project Area, who may be able to see the Project from their land. These typically comprise residents of large lot rural living properties and larger farmsteads and isolated rural residential properties within Mount Alma and Dumgree, especially views obtained from elevated areas.

Mount Alma typically contains a small number of scattered rural dwellings, most being situated between 5 km and 10 km from the Project Area, with one rural dwelling associated with the Project - Voewood - located 1 km from the Project Area. Possible views will be dependent on topography, vegetation, and infrastructure where present. Views from key locations within Mount Alma are assessed in:

- **Section 8.2.1: Viewpoint 1: Northwesterly view from Dawson Highway at intersection of Rockford Road**
- **Section 8.2.2: Viewpoint 2a: Easterly view from Voewood Property gate** – existing view (≈ 65° HFoV)
- **Section 8.2.2: Viewpoint 2b: Westerly view from Dawson Highway near Voewood Property** – existing view (≈ 170° HFoV)
- **Section 8.2.5: Viewpoint 5: Southerly view from Fig Tree Toad** – existing view (≈ 150° HFoV)
- **Section 8.2.6:** Viewpoint 6: Southeasterly view from Fig Tree Road – existing view (≈ 115° HFoV)

Views from Dumgree were not assessed in detail due to the generally restricted nature of views from these rural localities due to either the distance from the Project Area or presence of screening vegetation and topography.

8.1.2. Workers

A significant portion of the LVIA Study Area is a working rural landscape with agriculture and grazing lands. Rural workers would experience views of the OHTL monopoles and associated infrastructure as they go about their daily activities. The extent of the view would change in accordance with the topography and locality and would also be influenced by the presence of vegetation.

No specific viewpoints have been selected to assess the working landscape because views from the rural properties (described above) and local roads (described below) are considered to be representative of views of workers on rural properties.

8.1.3. Recreational viewers

Consideration has been made for potential recreational visitors to experience views to the Project Area from local attractions and recreational areas within the LVIA Study Area. However, there are no identified recreational areas within the LVIA Study Area, so few recreational viewers are anticipated to be present.

Whilst State forests and National Parks would typically contain recreational viewers, especially those protected areas that are recognised for their scenic amenity values, the only State forests and National Parks located within the LVIA Study Area is the Calliope Range State Forest. This State forest does not appear to be generally visited by recreational visitors due a lack of amenities and limited information on access, but is anticipated to be visited by self-sufficient local recreational visitors who appreciate these more remote qualities.

Located just outside of the LVIA Study Area, the Maxwelton State Forest, Don River State Forest, Kroombit Tops National Park and Dan National Park do not contain any access or recreational facilities and general information regarding these areas is quite limited. As such, views are not anticipated to be experienced by recreational visitors and are not considered further.

8.1.4. General road users

The main roads within the LVIA Study Area are described in **Section 6.1.1: Settlement and infrastructure** and illustrated on **Figure 3.** Visibility of the Project Area from these roads is variable relating to the presence of elevated topography and significant roadside shelterbelts in places. Typically, views are transient, but it is considered that the views of the Project Area when travelling east or west along the Dawson Highway would be possible with opportunities for filtering of views due to localised vegetation and topographical changes.

The Annual Average Daily Traffic (AADT) along the Dawson Highway at Mount Alma is 4,601, where the vast majority of road users would typically be local rural residents and rural workers. It is acknowledged that these road users would have a moderate to high interest in their surroundings. The following viewpoints assess the impact on users of the Dawson Highway:

- **Section 8.2.1: Viewpoint 1: Northwesterly view from Dawson Highway at intersection of Rockford Road**
- **Section 8.2.2: Viewpoint 2a: Easterly view from Voewood Property gate** – existing view (≈ 65° HFoV)
- **Section 8.2.2: Viewpoint 2b: Westerly view from Dawson Highway near Voewood Property** – existing view (≈ 170° HFoV)
- **Section 8.2.3: Viewpoint 3: Westerly view from Dawson Highway** – existing view and visualisation (≈ 170° HFoV)
- **Section 8.2.7: Viewpoint 7: Easterly view from Dawson Highway** – existing view (≈ 150° HFoV)

As noted in **Section 6.1.1: Settlement and infrastructure there are** local roads within proximity to the Project Area. While the impacts on some of the rural road users are assessed through the assessment of residential viewers on rural homesteads, the following additional viewpoints have been taken on local roads:

- **Section 8.2.4: Viewpoint 4: Southwesterly view from Duck Holes Road – existing view (≈ 170° HFoV and ≈ 85° HFoV)**
- **Section 8.2.5: Viewpoint 5: Southerly view from Fig Tree Toad** – existing view (≈ 150° HFoV)

- **Section 8.2.6: Viewpoint 6: Southeasterly view from Fig Tree Road – existing view (≈ 115° HFoV)**

Figure 7 Key Visual Receptors and Tourist Drives (in **Appendix 1**) shows the locations of key visual receptors and tourist drives in the area, though it is noted that there are no tourist routes passing within the LVIA Study Area. In this case, representative views from recreational viewers toward the Project Area are not anticipated and have not been considered further in the assessment.

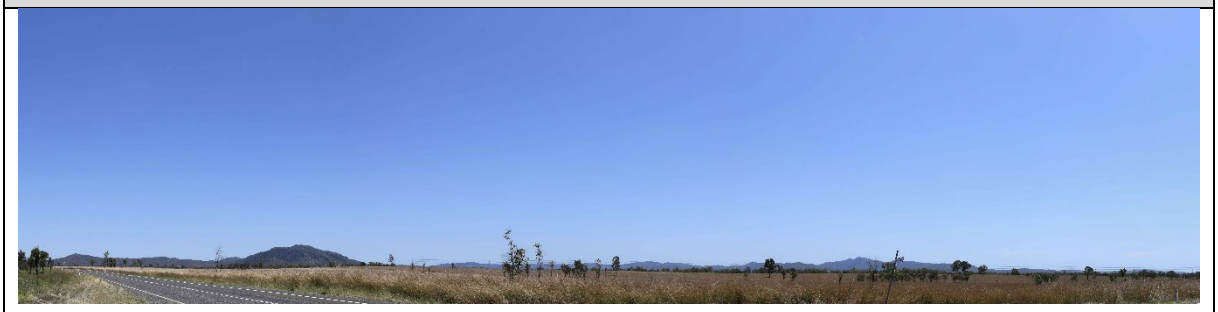
8.2. Viewpoint assessment

Using the field surveys and the method for assessing the significance of visual impacts described in **Section 3.1: Visual impact assessment methodology,** a summary of the baseline analysis and overall likely visual impact anticipated during the operation of the Project is provided for each viewpoint in **Table 21** to **Table 27.** As proposed lighting is only for the purposes of safety and security and would be the minimum required for such purposes lighting has not been assessed.

8.2.1. Viewpoint 1

Table 21: Likely visual impact of the Project Ara on Viewpoint 1

Viewpoint 1: Northwesterly view from Dawson Highway at intersection of Rockford Road	
Visual Baseline Assessment	
 **Existing view from Viewpoint 1: Northwesterly view from Dawson Highway at intersection of Rockford Road** Refer to **Figure** 8 and **Figure 9** in **Appendix 2** for appropriate scaled image and wider panoramic view.	
Location and description	• GPS Location: 24°6'4.758" S 150°48'14.802" E • Elevation: 75.0 m • Northwesterly view from Dawson Highway, providing moderately distant, open and transient views toward the Project. • Nearest proposed Project infrastructure within the Project Area is an OHTL monopoles approximately 1.5 km north-west of this viewpoint. • Represents typical views experienced by travellers moving along the Dawson Highway, including rural workers, rural residents and travellers. • This view exhibits a strong rural character that extends across the visible plains. This viewpoint is located in *LCT C: Lowland Rural Plains*, is largely comprised of open grazing land associated with agricultural land uses. Views also include *LCT E: Major Watercourses (*Calliope River) and distant views toward *LCT A: Forested Mountains and Ranges.* • Existing infrastructure within this view includes the 275 kV Calvale to Wurdong OHTL, powerlines and general road infrastructure associated with the Dawson Highway.
Key visual sensitivities	• Key visual receptors include: o a moderate number of travellers along the Dawson Highway including rural workers, local rural residents and travellers o a small number of nearby isolated rural residents who may experience similar views from their properties o rural workers on nearby properties who are considered to have a general interest in their surroundings. • As this viewpoint comprises open and clear views toward a landscape of rural character, with an elevated forested area within the background. The

Viewpoint 1: Northwesterly view from Dawson Highway at intersection of Rockford Road	
	presence of the existing 275 kV Calvale to Wurdong OHTL and highway infrastructure somewhat reduces the sensitivity of this view. • This viewpoint with the inclusion of the Calliope and Mount Alma Ranges contains clear yet distant views to elevated and vegetated landscapes of district and regional significance scenic value (7.5-10) as defined in GRCPS *Scenic Amenity Overlay Code*. It is noted that the Calliope Range is located within the LVIA Study Area, and Mount Alma Range is located outside of the LVIA Study Area. • This view also contains views to landscape elements and characteristics described in the GRCPS and BSPS including: o bushland and waterways o rural landscape character. • A moderate number of receptors experience this view and this stretch of the Dawson Highway, which is not a designated scenic route. This view provides both transient views to a moderate number of travellers along the Dawson Highway and prolonged viewing opportunities for a small number of isolated rural residents and rural workers. This outlook contains a strong rural character and landscape and visual characteristics identified by the GRCPS and BSPS.
Visual sensitivity	• ***Medium.***
Visual Evaluation	
 **Visualisation from Viewpoint 1: Northwesterly view from Dawson Highway at intersection of Rockford Road** Refer to **Figure** 8 and **Figure 9** in **Appendix 2** for appropriate scaled image and wider panoramic visualisation.	
Magnitude of change assessment	• The nearest Project infrastructure is an OHTL monopole located approximately 1.5 km north-west of this viewpoint and therefore views from this location are considered to be moderately distant. • The rural character of views toward both the Calliope and Mount Alma Ranges are already affected by the presence of the existing 275 kV Calvale to Wurdong OHTL and powerlines. • The Project is anticipated to result in a noticeable change and moderate distance, open and transient views toward the Project Area will be possible from flat sections of the Dawson Highway, where no to minimal vegetation is present in close proximity to the highway. • Vegetation located in close proximity to the Project Area may filter potential views of the switchyard and the OHTL monopoles, and additionally, these structures are anticipated to blend somewhat to the ranges in the background of the view. • Whilst views from the Dawson Highway are open and transient, views toward the Project are anticipated to be noticeable in a landscape where existing OHTL are present.

Viewpoint 1: Northwesterly view from Dawson Highway at intersection of Rockford Road	
Magnitude of change	• ***Medium.***
Significance of impact	• ***Moderate*** and ***Not Significant.***

8.2.2. Viewpoint 2

Table 22: Likely visual impact of the Project on Viewpoint 2

Viewpoint 2a: Easterly view from Voewood Property gate – existing view (≈ 65° HFoV)	
Visual Baseline Assessment	
 **Existing view from Viewpoint 2a: Easterly view from Voewood Property gate** – existing view (≈ 65° HFoV) Refer to **Figure 10** in **Appendix 2** for appropriate scaled image and wider panoramic view.  **Existing view from Viewpoint 2b: Westerly view from Dawson Highway near Voewood Property** – existing view (≈ 170° HFoV) Refer to **Figure 11** in **Appendix 2** for appropriate scaled image and wider panoramic view.	
Location and description	• GPS Location (2a): 24°5’41.532” S 150°49’36.618” E • GPS Location (2b): 24°5’41.532” S 150°49’36.618” E • Elevation (2a): 81.2 m • Elevation (2b): 66.1 m • Easterly views from the Voewood Property Gate (2a) and westerly views from the Dawson Highway near the Voewood Property (2b). • These views provide close, open views (2a) and very close, somewhat filtered views (2b) to the Project’s OHTL monopoles. It is noted that 2a is located 215 m south of the Dawson Highway, and 2b is located within the Project’s Disturbance Footprint. • Nearest proposed Project infrastructure within the Project Area comprises OHTL monopoles approximately 580 m east (2a) and 145 m east (2b and out of view) of this viewpoint. • Represents typical views experienced by travellers along the Dawson Highway, nearby isolated rural residential receptors and rural workers. • The view represents a strong rural character consistent with *LCT C: Lowland Rural Plains* with views out to *LCT D: Forested Lowlands* and the Mount Alma Range (2a) and distant views toward *LCT A: Forested Ranges* which includes the Calliope Range (2b). • Existing infrastructure evident within these views in addition to general road infrastructure associated with the Dawson Highway in both views includes

Viewpoint 2a: Easterly view from Voewood Property gate – existing view (≈ 65° HFoV)	
	(2a) ancillary farming infrastructure and the Moura system railway line and (2b) large scale towers located on the Calliope Range.
Key visual sensitivities	• Key visual receptors include: ○ a moderate number of travellers along the Dawson Highway including rural workers, local rural residents and tourists. ○ a very small number of isolated rural residents who would experience prolonged, very close to close views from this area and are considered to have a high level of interest in their surroundings ○ rural workers on nearby properties who are considered to have a general interest in their surroundings. • Each view contains filtered yet distant views to the Mount Alma Range (2a) and the Calliope Range (2b) which are both recognised as elevated and vegetated landscapes of district and regional significance scenic value (7.5-10) as defined in GRCPS *Scenic Amenity Overlay Code.* • This view also contains views to landscape elements and characteristics identified by the GRCPS and BSPS including: ○ bushland ○ rural landscape character. • While it is noted that prolonged viewing opportunities for a very small number of isolated rural residential residents and rural workers may be possible from this view, as these views are connected with the Voewood Property (which is associated with the Project), they are considered to be of negligible sensitivity. Therefore, this view is included to be representative of transient views obtained along the Dawson Highway. Both Viewpoint 2a and 2b provides transient views to a moderate number of travellers along this section of the Dawson Highway, which is not a scenic route. • Existing infrastructure including towers is visible from the Dawson Highway. The Project will introduce additional OHTL infrastructure into landscape that already contains large scale infrastructural components of existing towers.
Visual sensitivity	• ***Medium***
Visual Evaluation	
Magnitude of change assessment	• The nearest Project infrastructure is located approximately 580 m east (2a) and 145 m east (2b and out of view) of this viewpoint, and therefore views from these locations are considered to be close and very close respectively. • A visualisation for this Viewpoint was not prepared due to the views being somewhat filtered and therefore Viewpoint 1 was considered a better representative view from the Dawson Highway. • The Project is anticipated to result in a considerable change due to: ○ very close and close transient and open and somewhat filtered views toward the Project Area will be possible from sections along the Dawson Highway ○ the Project will be visible across the flat plains, with occasional vegetation partially screening views from the viewpoint location. • Whilst views experienced by receptors along this particular stretch of the Dawson Highway are likely to be mostly transient, open and somewhat open views across a very close and close distances will be perceptible from this viewpoint location as the infrastructure will present a considerable change. • While existing large scale infrastructural elements are visible from these viewpoints, the Project will add additional electricity transmission infrastructure into the rural landscape.

Viewpoint 2a: Easterly view from Voewood Property gate – existing view (≈ 65° HFoV)	
Magnitude of change	• ***Medium.***
Significance of impact	• ***Moderate*** and ***Not Significant.***

8.2.3. Viewpoint 3

Table 23: Likely visual impact of the Project on Viewpoint 3

Viewpoint 3: Westerly view from Dawson Highway – existing view and visualisation (≈ 170° HFoV)	
Visual Baseline Assessment	
 **Existing view from Viewpoint 3: Westerly view from Dawson Highway** – existing view and visualisation (≈ 170° HFoV) Refer to **Figure 12** and **Figure 13** in **Appendix 2** for appropriate scaled image and wider panoramic view.	
Location and description	• GPS Location: 24°5'39.78" S 150°49'47.478" E • Elevation: 66.4 m • Westerly view from the Dawson Highway, providing a combination of open and filtered, very close transient views, toward the western part of the Project Area. • Nearest proposed Project infrastructure within the Project Area is the OHTL approximately 175 m west of this viewpoint. • Represents typical views experienced by travellers along the Dawson Highway, nearby isolated rural residential receptors and rural workers. • This viewpoint encapsulates strong rural character extends across the visible plains. This viewpoint is located in *LCT C: Lowland Rural Plains*, background views of *LCT A: Forested Mountains and Ranges.* • Existing infrastructure evident within the view includes a tower located on top of the Calliope Range, powerlines and infrastructure associated with the Moura system railway line.
Key visual sensitivities	• Key visual receptors include: ○ a moderate number of travellers along the Dawson Highway including rural workers, local rural residents and travellers ○ rural workers on nearby properties who are considered to have a general interest in their surroundings. • This view includes somewhat filtered yet distant views toward the Calliope Ranges which are recognised as elevated and vegetated landscapes of district and regional significance scenic value (7.5-10) as defined in GRCPS *Scenic Amenity Overlay Code.* • This view also contains views to landscape elements and characteristics identified by the GRCPS and BSPS including: ○ bushland ○ rural landscape character. • This viewpoint provides transient views for a moderate number of travellers along this section of the Dawson Highway, which is not a scenic route.

<table>
<tr><th colspan="2">Viewpoint 3: Westerly view from Dawson Highway – existing view and visualisation (≈ 170° HFoV)</th></tr>
<tr><td></td><td>Prolonged viewpoint opportunities for a small number of isolated rural residential residents and rural workers are also possible.
• Whilst this view does contain existing infrastructure across some towers and the Moura railway line infrastructure, these are barely perceptible and somewhat reduces the sensitivity of the view.</td></tr>
<tr><td>Visual sensitivity</td><td>• Medium.</td></tr>
<tr><td colspan="2">Visual Evaluation</td></tr>
<tr><td colspan="2"> 
Visualisation of Viewpoint 3: Westerly view from Dawson Highway – existing view and visualisation (≈ 170° HFoV)
Refer to Figure 12 and Figure 13 in Appendix 2 for appropriate scaled image and wider panoramic view.</td></tr>
<tr><td>Magnitude of change assessment</td><td>• The nearest Project infrastructure is located approximately 175 m west of this viewpoint and therefore views from this location are considered to be very close.
• The Project is anticipated to result in a considerable change due to the following factors:
○ very close to moderately distant, transient, open and/or partially obscured views toward the western section of the Project that are experienced by travellers on the Dawson Highway. From this view, cabling between two very close OHTL monopoles located at 305 m and 270 m from this viewpoint respectively will cross the Dawson Highway. Additionally, the western section of the Project as it joins the switchyard will be visible within the distance.
○ as the Project Area will cross the Dawson Highway within this view, the visibility of the Project will be very clear. Vegetation in close proximity to the Dawson Highway may somewhat filter the OHTL monopole 305 m away from this view, however due to the size of the OHTL monopole at this very close distance, it will be predominantly visible.
• Whilst the Project will add additional large scale electricity transmission infrastructure within the view, the Project is not unusual within the broader landscape as existing towers, powerlines and railway infrastructure are broadly visible within the rural landscape.</td></tr>
<tr><td>Magnitude of change</td><td>• Medium.</td></tr>
<tr><td>Significance of impact</td><td>• Moderate and Not Significant.</td></tr>
</table>

8.2.4. Viewpoint 4

Table 24: Likely visual impact of the Project on Viewpoint 4

Visual Baseline Assessment	
 **Existing view from Viewpoint 4: Southwesterly view from Duck Holes Road** Refer to **Figure 16** in **Appendix 2** for appropriate scaled image and wider panoramic view.	
Location and description	• GPS Location: 24°5'24.828" S 150°49'52.902" E • Elevation: 79.3 m • Southwesterly view from Duck Holes Road, providing very close mostly open views toward the Project Area. It is noted that this view is located within the Project's Disturbance Footprint. • Nearest proposed Project infrastructure within the Project Area is an OHTL monopole located approximately 270 m west of this viewpoint. • Represents typical views experienced by nearby isolated rural residents, rural workers and travellers along Duck Holes Road. • The view represents a strong rural character consistent with in *LCT C: Lowland Rural Plains,* largely comprised of open grazing land associated with agricultural land uses, with distant views toward *LCT A: Forested Mountains and Ranges,* which includes the Calliope Range. • Existing infrastructure evident within this view includes a met mast tower on top of the Calliope Range and railway infrastructure associated with the Moura system railway line.
Key visual sensitivities	• Key visual receptors include: ○ travellers on Duck Holes Road who may experience very close views toward the Project Area ○ rural workers who are considered to have a moderate interest in their surroundings. • This view includes somewhat filtered yet distant views toward the Calliope Ranges, which are recognised as elevated and vegetated landscapes of district and regional significance scenic value (7.5-10) as defined in GRCPS *Scenic Amenity Overlay Code.* • This view is located 270 m from the CICSDA. In addressing physical characteristics required in the CICSDA Development Scheme, the lowland rural plain within this section of CICSDA have a generally flat profile, a low degree of naturalness or scenic value due to clearing, grasses and regrowth vegetation and the landscape is broadly used for grazing activities. • This view also contains views to landscape elements and characteristics identified by the GRCPS and BSPS including: ○ bushland ○ rural landscape character. • While the Calliope Range is acknowledged as having scenic values within the GRCPS, only a small number of travellers on Duck Hole Road and rural workers may experience this view.

Visual sensitivity	• ***Low***
Visual Evaluation	
Magnitude of change assessment	• The nearest Project infrastructure is located approximately 270 m west of this viewpoint and therefore views from this location are considered to be very close. • A visualisation for this Viewpoint was not considered due to low number of receptors who may access this view. • The Project is anticipated to result in a considerable change due to the following factors: o very close to moderately distant, transient, open and somewhat open views toward the western section of the Project Area will be experienced by travellers on Duck Holes Road. From this view, a number of OHTL monopoles and the switchyard within the western section of the Project Area will be visible o the Project will be clearly visible across the open plain, with screening of the Project Area by the vegetation shelterbelts within the western part of the view. o Upgrades to Duck Holes Road are anticipated to be required as part of the project, and views toward the Project are likely to be possible from the upgraded roadway. • Two OHTL monopoles within the CICSDA will be located within this view. It is noted that the physical character of this view will not be broadly affected with the inclusion of these OHTL addition due to generally cleared nature of the vegetation which has already occurred within this landscape character. While it is not possible to minimise the OHTLs in their size or structural requirements, each tower will be micro-sited to accommodate structural requirements in relation to the underground gas pipeline infrastructure. • The proximity of isolated rural residential receptors to the Project may experience prolonged views toward the Project Area, however views may be screened by localised topography from some locations. • Whilst the Project will add additional large scale energy infrastructure within the view, the Project is not unusual within the broader landscape as existing towers and railway infrastructure is visible within the rural landscape.
Magnitude of change	• ***Low***
Significance of impact	• ***Minor*** *and* ***Not Significant.***