

Ian Colvin
Senior Ecologist
ReconEco Pty Ltd
PO Box 5313
East Lismore NSW 2480

Date: 15/06/2023

To:
Peter Hughes
Senior Project Manager | Senior Manager Construction Procurement and Assurance
NSW Public Works | Department of Regional NSW
Via email: peter.hughes@pwa.nsw.gov.au
Copy to Fiona Gainsford: fiona@gainsford.com.au

Proposed new Fire Control Centre – Narrabri: Baseline Biodiversity Assessment

Peter,

This letter summarises the result of an assessment of biodiversity matters relating to the proposed new Fire Control Centre at Lot 8 DP1212638 Newell Highway Narrabri. It is understood the project footprint (as per the plans supplied at **Attachment A**) is ~ 0.87 ha and several isolated trees may require removal for helicopter safety.

The scope of works for the assessment comprised:

- Desktop assessment: a search within 5km of the site using the BioNet atlas for conformed records of threatened species
- Field assessment: inspection vegetation at the site with regard to tree identification and determining whether grassland comprises native vegetation
- Assess statutory requirements with regard to triggering the Biodiversity Offsets Scheme (BOS) established in the *Biodiversity Conservation Act 2016* (BC Act).

The site is not on the Biodiversity Values Map nor within an area of outstanding biodiversity value as per the BC Act. Under the BC Act, the minimum lot size (MLS) of a site determines the area clearing threshold. The site is not allocated a MLS in the Narrabri Local Environmental Plan 2012. In these instances the MLS is the size of the site itself. The site is ~2 ha in area, therefore up to 0.5 ha of native vegetation may be cleared before the BOS is triggered.

A field inspection was completed on 15th April 2023, all vegetation within the site was inspected and ground cover vegetation assessed with regard to the presence of native species. Results of the field and statutory assessment follow.

Desktop assessment

BioNet results (refer **Attachment B**) confirmed records of four threatened flora and 25 threatened flora species within 5km of the site; several species are also listed under the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Vegetation assessment

Vegetation

The project footprint comprises highly disturbed cleared land which includes bare soil/ hardstand areas used for truck parking, and stockpile areas for gravel and mulch. Grassland is maintained by slashing, with the exception of wet areas around depressions and a constructed drain. Six naturally occurring trees occur (refer **Table 1** and vegetation plan at **Attachment C**), in addition to 3 x planted Creek Bottlebrush (*Callistemon viminalis*) along the southern boundary. Along the eastern boundary several shrubs occur on the fenceline (Western Boobialla *Myoporum montanum*, Hakea Wattle *Acacia hakeoides*). On the basis of the proposal (and due to helicopter requirements) three mature trees and two immature trees would be impacted (refer **Table 1**).

Table 1. Native trees within the site

Species	Dbh (cm)	Height (m)	Comments	Impacted?
Narrow-leaved Grey Box (Tree #1) <i>Eucalyptus pillagensis</i> *	35	18	Inactive Crow/Magpie nest	YES
Narrow-leaved Grey Box (Tree #2) <i>Eucalyptus pillagensis</i> *	45	18	Twin trunk; with Western Boobialla	YES
Narrow-leaved Grey Box (Tree #3) <i>Eucalyptus pillagensis</i> *	100	16	With Kurrajong; several hollows present	YES
Narrow-leaved Grey Box (Tree #4) <i>Eucalyptus pillagensis</i> *	100	18	Hollow present; 2 x large trunk scars (potential cultural heritage values); inactive Crow/Magpie nest	NO
Western Boobialla <i>Myoporum montanum</i>	3	2	Small multi-stemmed shrub at base of Tree #2	YES
Kurrajong <i>Brachychiton acerifolius</i>	5	4	Small tree at base of Tree #3	YES

*Trees could not be confidently assigned to *E. microcarpa* or the closely related *E. pillagensis* (also referred to as *E. woollsiana*). *E. pillagensis* is a narrow-leaved form of *E. macrocarpa*. Several trees at the site were in flower and buds and fruit were evident, however none of the subject trees had any juvenile growth, which is the means of distinguishing between the two species. As the EUCLID database notes "Not all specimens of *E. microcarpa* and *E. woollsiana* will be easily identified and, without juvenile leaves, may be impossible to assign to one name or the other". Due to specimens at the site generally having leaf widths of 1.5 - 2 cm and substantial local BioNet records, an identification of *E. pillagensis* has been cautiously applied.

Grassland is entirely dominated by an infestation of the weed species Sabi Grass* (*Urochloa mosambicensis*), with other species very infrequent, including African Lovegrass* (*Eragrostis curvula*), Pale Setaria* (*Setaria pumila*), Paspalum * (*P. dilatatum*), Rhodes Grass* (*Chloris gayana*), Mayne's Pest (*Glandularia aristigera*) and the native species Couch (*Cynodon dactylon*) and Spring Grass (*Eriochloa procerus*). Several consolidated patches of Couch occur where gravel and waste ground has been colonized.

*denotes non-native species

Within and surrounding a constructed drain and in several depressions, wetland species occur including Nardoo (*Marsilea drummondii*), Cyperus (*Cyperus bifax*, *Cyperus eragrostis**), Flat Sedge (*Eleocharis plana*), and the native grasses Beetle Grass (*Diplachne* sp.), Weeping Lovegrass (*Eragrostis parviflora*) and Spring Grass. Although weed species occur these areas are considered representative of native vegetation, albeit in a disturbed state.

Photos of vegetation are provided at **Attachment D**.

Native vegetation was recorded as follows:

- All 'wetland' areas were surveyed by GPS with the two main patches being 0.06 ha and 0.025 ha. An additional small area of 10m² was recorded. In total wetland native vegetation totals 0.086 ha, which was rounded to 0.09 ha to account for inaccuracies.
- Patches of pure Couch were paced out and an area estimate applied. In total these areas totaled ~ 70m².
- Slashed grassland was surveyed using the 'Assessing native groundcover' guideline (Local Land Services, undated), whereby 5 sample points were located within the impact area and 10 quadrats of 1m x 1m were randomly placed (total of 50 quadrats). Within each quadrats the proportion of groundcover and native vegetation was estimated. Results of the assessment indicated that within the impact area native species comprise <10% of the groundcover (actual result of 8.58% native species).

The BAM assessor resources webpage notes the following approach to determining how to assess exotic groundcover in heavily disturbed landscapes with regard to area clearing thresholds as per the Biodiversity Offsets Scheme (BOS):

1. where there is greater than 75% native vegetation in the ground cover then treat the vegetation as 100% native and assess the area to be cleared accordingly.
2. where the proportion of exotic to native vegetation in the ground cover is between 15-75% - the calculation of native vegetation extent is adjusted by multiplying the proportion (%) of native cover by the total area to be cleared.
3. where there is less than 15% native ground cover all vegetation can be considered exotic and the area clearing threshold will not be exceeded.

On the basis of the grassland assessment (vegetation type 'c'), < 15% native ground cover occurs within the project footprint, therefore all grassy groundcover vegetation is considered exotic (ie. non-native). While areas of native groundcover will be impacted (vegetation types a and b), these are small in area (< 0.1 ha) and in combination with removal of the 3 x isolated Grey Box the clearing threshold of 0.5 ha would not be exceeded. On this basis, the project would not trigger the BOS and a Biodiversity Development Assessment Report (BDAR) would not be required for the project application.

Threatened flora

The site is highly degraded, modified and disturbed; no threatened flora were recorded, nor are likely to occur.

Threatened communities

While the site has been historically cleared, the four Inland Grey Box present could be considered to represent a highly fragmented and degraded form of the threatened ecological community (TEC) 'Inland Grey Box Woodland In the Riverina, NSW South Western Slopes, Cobar Penepine, Nandewar and Brigalow Belt South Bioregions'. This community is evident further west of the site along the Newell Highway where a mixed woodland including Inland Grey Box (*E. microcarpa* and/or *E. pillagensis*) occurs with Blinbill Box (*E. populnea*) and River Red Gum (*E. camaldulensis*).

Due to the highly degraded nature of the site (and almost complete absence of native vegetation), the TEC is considered only to apply to the individual mature eucalypts (where for example some limited native species characteristic of the TEC occur eg. *Elnadia nutans*, *Enchylaena tomentosa*, in addition to the two immature trees – Kurrajong, Western Boobialla). These species are absent from all other areas of the site.

Degraded grassland at the site with no woody vegetation is excluded on the basis of being non-native vegetation which is not characteristic of Inland Grey Box Woodland TEC.

This TEC is also listed at a federal level (EPBC Act) as the community 'Grey Box (*Eucalyptus microcarpa*) Grassy Woodlands and Derived Native Grasslands of South-Eastern Australia', where it is subject to condition thresholds. Vegetation at the site does not meet these thresholds.

Habitat values

Two of the Grey Box contain hollows which may be utilised for nesting or denning and two inactive stick nests were observed. Opportunistic searches did not record any Koala scats. Trees at the site would be used as opportunistic foraging habitat for a range of common bird species. Slashed grassland is of very low habitat value. The proposal would not result in any significant reduction of fauna habitat values in the locality in a local context due to the removal of five isolated trees.

Impacts

The proposal would require the removal of five isolated trees – 3 x Inland Grey Box (one of which contains hollows) and two shrubs (refer Table 1), disturbed areas of native vegetation around drainlines/depressions, a single planted Creek Bottlebrush and non-native grassland over a footprint of ~ 0.87 ha. The balance of the site would not be impacted and tree #4 would be retained. Isolated shrubs of wattle and Boobialla along the eastern fenceline would be retained.

Assessment Pathway - Biodiversity Conservation Act 2016

A proposal has potential to trigger the BOS if:

- Impacts occur to an area of outstanding biodiversity value (AoBV)
- Impacts occur on an area mapped on the Biodiversity Values Map
- The amount of native vegetation being cleared exceeds the relevant area threshold, or
- A test of significance (ToS) under s7.3 of the BC Act determines that a significant impact would occur to threatened species, communities or their habitats.

The site is not an AoBV, nor does it occur on the Biodiversity Values Map.

As noted, the project would not trigger the BOS with regard to exceeding the native vegetation clearing threshold due to the majority of the project footprint being non-native vegetation, with vegetation impacted (as described above) not exceeding 0.5 ha in area.

A ToS has been completed (refer **Attachment E**) with regard to:

- Impacts to the TEC 'Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions', as 3 of the 4 Grey Box on the site would be removed.
- Threatened fauna which may utilise the site for habitat requirements, particularly with regard to the loss of a single hollow-bearing tree.

The ToS concluded that the proposal would be unlikely to significantly impact any of the threatened entities assessed. To mitigate the loss of the hollow-bearing tree, it is recommended that a nest box is installed within the single tree to be retained (tree #4).

I trust this information meets your needs; if you require any further information please get in touch.

Regards,



Ian Colvin
Senior Ecologist
Accredited Biodiversity Assessor (BAAS18055)
m: 0401 447 552
e: ian@reconeco.com.au

Attachment A – Building Plan

Attachment B – BioNet database results

Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (° rounded to 0.1°; ^ rounded to 0.01°. Copyright © State of NSW through the Department of Planning, Industry and Environment. Search criteria : Licensed Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Plants in selected area [North: -30.30 West: 149.71 East: 149.81 South: -30.40] returned a total of 7 records of 4 species.

Report generated on 15/06/2023 12:08 PM

Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records
Plantae	Flora	Brassicaceae	1816	<i>Lepidium aschersonii</i>		Spiny Peppercress	V	V	2
Plantae	Flora	Brassicaceae	1824	<i>Lepidium monophlooides</i>		Winged Peppercress	E1	E	1
Plantae	Flora	Fabaceae (Faboidae)	3048	<i>Swainsona murrayana</i>		Slender Darling Pea	V	V	2
Plantae	Flora	Poaceae	4895	<i>Dichanthium setosum</i>		Bluegrass	V	V	2

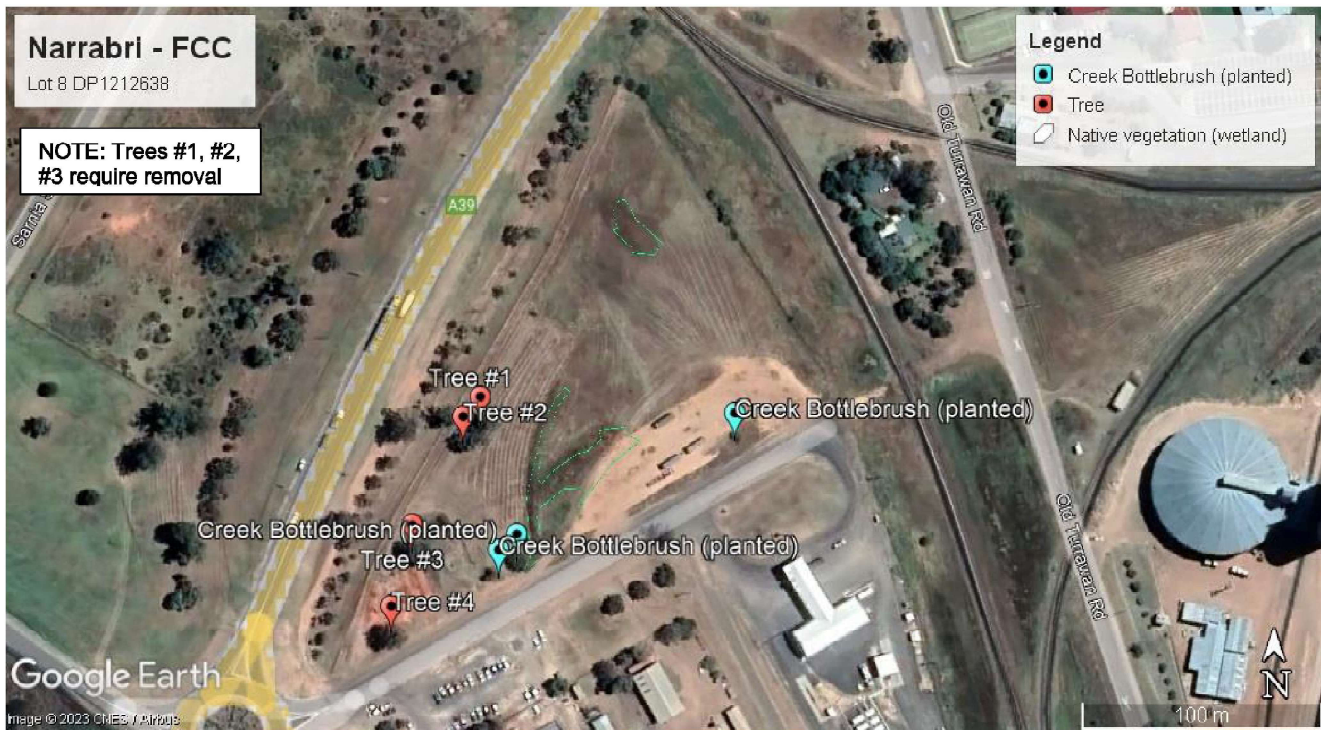
Data from the BioNet Atlas website, which holds records from a number of custodians. The data are only indicative and cannot be considered a comprehensive inventory, and contain errors and omissions. Species listed under the Sensitive Species Data Policy may have their locations denatured (° rounded to 0.1°; ^ rounded to 0.01°). Copyright © State of NSW through the Department of Planning, Industry and Environment. Search criteria : Licensed Report of all Valid Records of Threatened (listed on BC Act 2016) or Commonwealth listed Animals in selected area [North: -30.30 West: 149.71 East: 149.81 South: -30.40] returned a total of 96 records of 25 species.

Report generated on 15/06/2023 12:09 PM

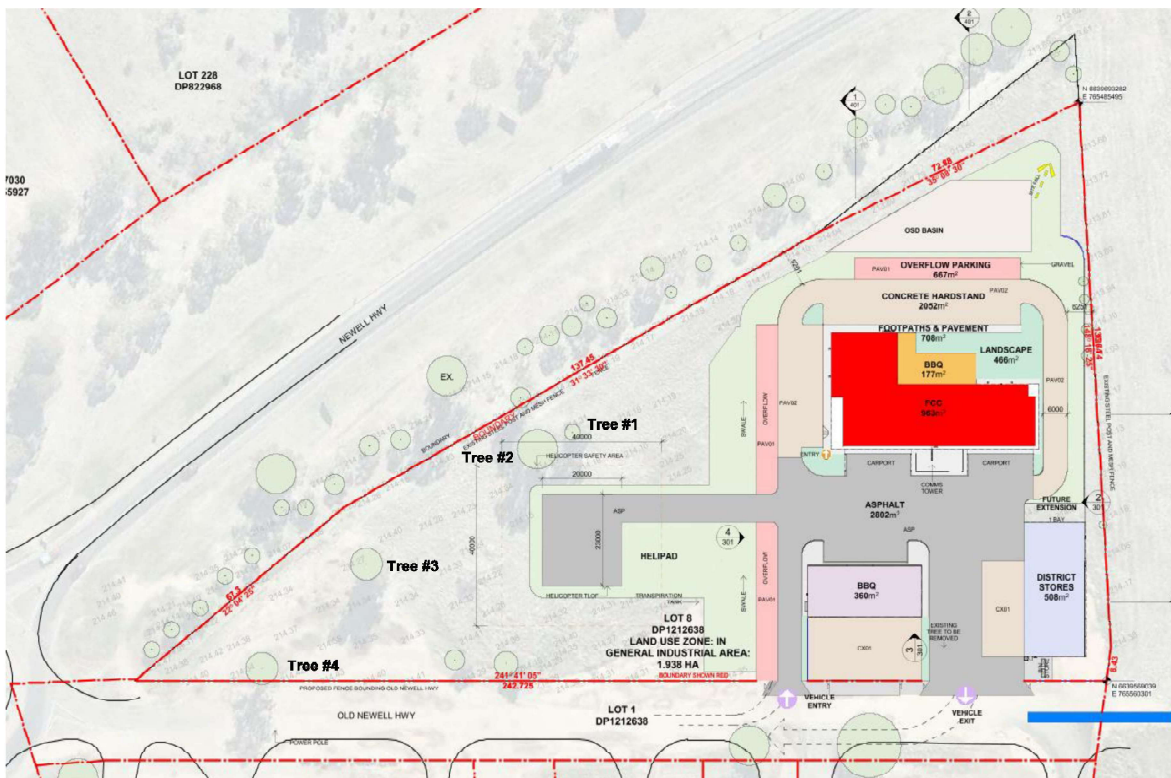
Kingdom	Class	Family	Species Code	Scientific Name	Exotic	Common Name	NSW status	Comm. status	Records
Animalia	Reptilia	Scincidae	2042	<i>Anomalopus mackayi</i>		Five-clawed Worm-skink	E1,P	V	1
Animalia	Reptilia	Elapidae	2673	<i>Hemiaspis damelii</i>		Grey Snake	E1,P	E	1
Animalia	Aves	Anseranatidae	0199	<i>Anseranas semipalmata</i>		Magpie Goose	V,P		27
Animalia	Aves	Anatidae	0216	<i>Oxyura australis</i>		Blue-billed Duck	V,P		2
Animalia	Aves	Anatidae	0214	<i>Stictonetta naevosa</i>		Freckled Duck	V,P		1
Animalia	Aves	Apodidae	0334	<i>Hirundapus caudacutus</i>		White-throated Needletail	P	V,C,J,K	2
Animalia	Aves	Ciconiidae	0183	<i>Ephippiorhynchus asiaticus</i>		Black-necked Stork	E1,P		4
Animalia	Aves	Accipitridae	0218	<i>Circus assimilis</i>		Spotted Harrier	V,P		1
Animalia	Aves	Accipitridae	0226	<i>Haliaeetus leucogaster</i>		White-bellied Sea-Eagle	V,P		1
Animalia	Aves	Accipitridae	0225	<i>Hieraetus morphnoides</i>		Little Eagle	V,P		4
Animalia	Aves	Accipitridae	0230	<i>Lophoictinia isura</i>		Square-tailed Kite	V,P,P,3		3
Animalia	Aves	Falconidae	0238	<i>Falco subniger</i>		Black Falcon	V,P		3
Animalia	Aves	Burhinidae	0174	<i>Burhinus grallarius</i>		Bush Stone-curlew	E1,P		1
Animalia	Aves	Rostratulidae	0170	<i>Rostratula australis</i>		Australian Painted Snipe	E1,P	E	3
Animalia	Aves	Psittaciidae	0260	<i>Glossopsitta pusilla</i>		Little Lorikeet	V,P		2
Animalia	Aves	Psittaciidae	0277	<i>Polytelis swainsonii</i>		Superb Parrot	V,P,P,3	V	2
Animalia	Aves	Strigidae	0246	<i>Ninox connivens</i>		Barking Owl	V,P,P,3		3
Animalia	Aves	Tytonidae	0252	<i>Tyto longimembris</i>		Eastern Grass Owl	V,P,P,3		2
Animalia	Aves	Acanthizidae	0504	<i>Cithonocola sagittata</i>		Speckled Warbler	V,P		1
Animalia	Aves	Pomatosulomidae	8388	<i>Pomatosomus temporalis</i>		Grey-crowned Babbler (eastern subspecies)	V,P		21

Animalia	Aves	Neositidae	0549	<i>Daphoenositta chrysoptera</i>	Varied Sittella	V,P		2
Animalia	Mammalia	Phascolarctidae	1162	<i>Phascolarctos cinereus</i>	Koala	E1,P	E	2
Animalia	Mammalia	Pteropodidae	1280	<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V,P	V	2
Animalia	Mammalia	Emballonuridae	1321	<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	V,P		4
Animalia	Mammalia	Molossidae	1329	<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tailed Bat	V,P		1

Attachment C – Vegetation Plan



- Green polygons depict native vegetation within drainlines and depressions
- All trees with red markers comprise the TEC 'Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions'.



Attachment D – Photographs



Plate 1. South-east of site (view to east) showing hardstand and disturbed areas used for truck parking



Plate 2. Slashed exotic grassland within the proposal area (east of site)



Plate 3. Stockpiled mulch and hardstand area in west of site. Tree # 3 (circled in red) is proposed for removal; planted Creek Bottlebrush are circled in blue



Plate 4. Constructed drain and wet area (unslashed) with native sedges and grasses



Plate 5. Trees #1 & 2 to be removed (circled) view from northern boundary to south



Plate 6. Trees #4 in west of site with trunk scarring

Attachment E – Test of Significance (BC Act)

The threatened species test of significance (ToS) is used to determine if a development or activity is likely to significantly affect threatened species or ecological communities, or their habitats. The ToS is applied as part of the Biodiversity Offsets Scheme (BOS) entry requirements and is set out in s.7.3 of the *Biodiversity Conservation Act 2016*.

A ToS has been completed for the TEC 'Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Penepplain, Nandewar and Brigalow Belt South Bioregions' and several threatened fauna species based on a potential occurrence assessment based on results of the BioNet search results at **Appendix B**, as below in **Table E.1**. Species profiles are provided in **Table E.2**.

Table E.1 Potential occurrence assessment

Scientific Name	Common Name	Habitat requirements and potential occurrence
<i>Anomalopus mackayi</i>	Five-clawed Worm-skink	<i>Found close to or on the lower slopes of slight rises in grassy White Box woodland on moist black soils, and River Red Gum-Coolibah-Bimble Box woodland on deep cracking loose clay soils. May also occur in grassland areas and open paddocks with scattered trees. Lives in permanent deep tunnel-like burrows and deep soil cracks, coming close to the surface under fallen timber and litter, especially partially buried logs.</i> Habitat unsuitable – degraded and lacks litter and ground cover complexity.
<i>Hemiaspis damelii</i>	Grey Snake	<i>Found on margins of ephemeral wetlands within River Red Gum (Eucalyptus camaldulensis) and Black Box (E. largiflorens) vegetation communities and Tangled Lignum (Duma florulenta) swamps. The species shelters in soil cracks, rocks, logs, flood debris, and abandoned burrows within these habitats.</i> Habitat unsuitable – degraded and lacks litter and ground cover complexity.
<i>Anseranas semipalmata</i>	Magpie Goose	<i>Shallow wetlands (<1 m deep), large swamps and dams with dense growth of rushes or sedge.</i> Habitat absent.
<i>Oxyura australis</i>	Blue-billed Duck	<i>Prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation.</i> Habitat absent.
<i>Stictonetta naevosa</i>	Freckled Duck	<i>Permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree.</i> Habitat absent.
<i>Hirundapus caudacutus</i>	White-throated Needletail	<i>Almost exclusively aerial (above 1000m) but may have a preference for wooded areas.</i> Potential foraging habitat unaffected.
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	<i>Shallow, permanent, freshwater terrestrial wetlands, and surrounding marginal vegetation, including swamps, floodplains, watercourses and billabongs, freshwater meadows, wet heathland, farm dams and shallow floodwaters, as well as extending into adjacent grasslands, paddocks and open savannah woodlands.</i> Habitat absent – wetland habitat too small and degraded to be suitable.
<i>Circus assimilis</i>	Spotted Harrier	<i>Grassy open woodland, inland riparian woodland, grassland and shrub steppe.</i> Habitat absent – site highly disturbed.
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	<i>Occurs near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and at, or in the</i>

Scientific Name	Common Name	Habitat requirements and potential occurrence
		vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. Habitat absent.
<i>Hieraaetus morphnoides</i>	Little Eagle	Open eucalypt forest, woodland or open woodland. She oak or acacia woodlands and riparian woodlands of interior NSW are also used. Habitat absent – site is degraded and too small in area and to provide suitable prey resources. <i>Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses.</i> Habitat absent – site is degraded and too small in area and to provide suitable prey resources.
<i>Lophoictinia isura</i>	Square-tailed Kite	
<i>Falco subniger</i>	Black Falcon	Solitary, active aggressive falcon of open plains and sparse woodland and shrubland, sometimes coastal open areas. Habitat absent – site is degraded and too small in area and to provide suitable prey resources.
<i>Burhinus grallarius</i>	Bush Stone-curlew	Open forests and woodlands with a sparse grassy ground-layer and fallen timber. Habitat unsuitable – degraded and lacks litter and ground cover complexity.
<i>Rostratula australis</i>	Australian Painted Snipe	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Habitat absent.
<i>Glossopsitta pusilla</i>	Little Lorikeet	Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Potential foraging and nesting habitat present – ToS required.
<i>Polytelis swainsonii</i>	Superb Parrot	Inhabit Box-Gum, Box-Cypress-pine and Boree woodlands and River Red Gum forest. Feed in trees and understorey shrubs and on the ground and their diet consists mainly of grass seeds and herbaceous plants. Potential foraging and nesting habitat present – ToS required.
<i>Ninox connivens</i>	Barking Owl	Inhabits woodland and open forest, including fragmented remnants. Two or three eggs are laid in hollows of large, old trees. Habitat absent – site is degraded and too small in area and to provide suitable prey resources. Hollow trees are not of suitable size for breeding
<i>Tyto longimembris</i>	Eastern Grass Owl	Areas of tall grass, including tussocks in swampy areas, grassy plains, swampy heath, cane grass, sedges on flood plains. Habitat unsuitable – degraded and disturbed.
<i>Chthonicola sagittata</i>	Speckled Warbler	A wide range of Eucalyptus dominated communities that have a grassy understorey, often on rocky ridges or in gullies. Habitat absent/degraded.
<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler	Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Potential foraging habitat present – ToS required.

Scientific Name	Common Name	Habitat requirements and potential occurrence
<i>Daphoenositta chrysoptera</i>	Varied Sittella	<i>Inhabits eucalypt forests and woodlands, especially rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland.</i> Habitat absent/degraded.
<i>Phascolarctos cinereus</i>	Koala	<i>Inhabits eucalypt forest and woodland. The suitability of forest and woodland communities is influenced by the size and species of trees present, soil nutrients, climate, rainfall and the size and disturbance history of the habitat patches.</i> Potential feed trees occur – ToS required.
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	<i>Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.</i> Potential foraging trees occur – ToS required.
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheathtail-bat	<i>Forages in most habitats across its very wide range, with and without trees. Roosts singly or in groups of up to six, in tree hollows and buildings.</i> Potential foraging and roosting habitat present – ToS required.
<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tailed Bat	<i>Occurs in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in man-made structures.</i> Potential foraging and roosting habitat present – ToS required.

Table E.2 Threatened species profiles

Common Name	Habitat and Ecology * #	Threats * #
Little Lorikeet	<ul style="list-style-type: none"> Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species. Feeds mostly on nectar and pollen, occasionally on native fruits such as mistletoe, and only rarely in orchards Gregarious, travelling and feeding in small flocks (<10), though often with other lorikeets. Flocks numbering hundreds are still occasionally observed and may have been the norm in past centuries. Roosts in treetops, often distant from feeding areas. Nests in proximity to feeding areas if possible, most typically selecting hollows in the limb or trunk of smooth-barked Eucalypts. Entrance is small (3 cm) and usually high above the ground (2–15 m). These nest sites are often used repeatedly for decades, suggesting that preferred sites are limited. Riparian trees often chosen, including species like Allocasuarina. Nesting season extends from May to September. In years when flowering is prolific, Little Lorikeet pairs can breed twice, producing 3–4 young per attempt. However, the survival rate of fledglings is unknown. 	<ul style="list-style-type: none"> Given that large old Eucalyptus trees on fertile soils produce more nectar, the extensive clearing of woodlands for agriculture has significantly decreased food for the lorikeet, thus reducing survival and reproduction. Small scale clearing, such as during roadworks and fence construction, continues to destroy habitat and it will be decades before revegetated areas supply adequate forage sites. The loss of old hollow bearing trees has reduced nest sites, and increased competition with other native and exotic species that need large hollows with small entrances to avoid predation. Felling of hollow trees for firewood collection or other human demands increases this competition. Competition with the introduced Honeybee for both nectar and hollows exacerbates these resource limitations. Infestation of habitat by invasive weeds. Inappropriate fire regimes. Aggressive exclusion from forest and woodland habitat by over abundant Noisy Miners. Climate change impacts including reduction in resources due to drought. Degradation of woodland habitat and vegetation structure due to overgrazing.
Superb Parrot	<ul style="list-style-type: none"> Inhabit Box-Gum, Box-Cypress-pine and Boree woodlands and River Red Gum forest. In the Riverina superb parrots nest in the hollows of large trees (dead or alive) mainly in tall riparian River Red Gum forest or woodland. On the South West Slopes and Southern Tablelands nest trees can be in open Box-Gum woodland or isolated living or dead paddock trees. Species known to be used are Blakely's Red Gum, Yellow Box, Apple Box and Red Box. Superb Parrots nest in tree hollows with an entrance diameter of 6 cm or wider, and that are at least 3.5 m above the ground Nest in small colonies, often with more than one nest in a single tree. Breed between September and January, with nesting typically from October to late December. May forage up to 10 km from nesting sites, primarily in grassy box woodland. Feed in trees and understorey shrubs and on the ground and their diet consists mainly of grass seeds and herbaceous plants. Also eaten are fruits, berries, nectar, buds, flowers, insects and grain. 	<ul style="list-style-type: none"> Loss of living and dead hollow-bearing trees. Loss of breeding and foraging habitat. Loss of breeding and foraging habitat. Poor regeneration of nesting trees and food resources. Loss of habitat from private native forestry activities. Feeding on grain spills and subsequently being struck by vehicles. Loss of hollows to feral bees and native and exotic hollow-nesting birds. Illegal trapping which can also result in the destruction of hollows. Illegal shooting of birds in orchards. Lack of knowledge of population trends in the Superb Parrot. Lack of knowledge of key flight paths and corridors of the Superb Parrot. Loss of habitat trees from fire damage during hazard reduction and stubble burns. Lack of knowledge about the breeding ecology and breeding success of this species. Competition with Noisy Miners for breeding and foraging habitat and resources.
Grey-crowned Babbler	<ul style="list-style-type: none"> Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Woodlands on fertile soils in coastal regions. 	<ul style="list-style-type: none"> Loss, degradation and fragmentation of woodland habitat on high fertility soils. Excessive total grazing pressure and loss of coarse woody debris is resulting in degradation and loss of important habitat components.

Common Name	Habitat and Ecology * #	Threats * #
	<ul style="list-style-type: none"> • Flight is laborious so birds prefer to hop to the top of a tree and glide down to the next one. Birds are generally unable to cross large open areas. • Live in family groups that consist of a breeding pair and young from previous breeding seasons. A group may consist of up to fifteen birds. All members of the family group remain close to each other when foraging. A soft 'chuck' call is made by all birds as a way of keeping in contact with other group members. • Feed on invertebrates, either by foraging on the trunks and branches of eucalypts and other woodland trees or on the ground, digging and probing amongst litter and tussock grasses. • Build and maintain several conspicuous, dome-shaped stick nests about the size of a football. A nest is used as a dormitory for roosting each night. Nests are usually located in shrubs or sapling eucalypts, although they may be built in the outermost leaves of low branches of large eucalypts. Nests are maintained year round, and old nests are often dismantled to build new ones. • Breed between July and February. Usually two to three eggs are laid and incubated by the female. During incubation, the adult male and several helpers in the group may feed the female as she sits on the nest. Young birds are fed by all other members of the group. • Territories range from one to fifty hectares (usually around ten hectares) and are defended all year. Territorial disputes with neighbouring groups are frequent and may last up to several hours, with much calling, chasing and occasional fighting. 	<ul style="list-style-type: none"> • Infestation of habitat by invasive weeds including exotic perennial grasses. These weeds are very aggressive and form dense grass swards covering inter-tussock spaces preventing access to leaf and stick litter where babblers commonly forage for invertebrates. • Inappropriate fire regimes - excessive fires lead to loss of tree and shrub regeneration and absence of fire may lead to the grass sward being too dense and therefore unsuitable for foraging by babblers. • Aggressive exclusion from forest and woodland habitat by over abundant Noisy Miners. • Climate change impacts including reduction in resources due to drought. • Nest predation by species such as ravens and butcherbirds may be an issue in some regions where populations are small and fragmented.
Koala	<ul style="list-style-type: none"> • Inhabit eucalypt woodlands and forests. • Feed on the foliage of more than 70 eucalypt species and 30 non-eucalypt species, but in any one area will select preferred browse species. • Inactive for most of the day, feeding and moving mostly at night. • Spend most of their time in trees, but will descend and traverse open ground to move between trees. • Home range size varies with quality of habitat, ranging from less than two ha to several hundred hectares in size. • Generally solitary, but have complex social hierarchies based on a dominant male with a territory overlapping several females and sub-ordinate males on the periphery. • Females breed at two years of age and produce one young per year. 	<ul style="list-style-type: none"> • Loss, modification and fragmentation of habitat • Vehicle strike • Predation by roaming or domestic dogs • Intense prescribed burns or wildfires that scorch or burn the tree canopy • Koala disease • Heat stress through drought and heatwaves • Inadequate support for fauna rehabilitation and emergency response • Small population size or geographically isolated populations. • Poor understanding of population distribution and trend • Poor understanding of animal movements and use of habitat • Poor understanding of social and economic value of koalas to community
Grey-headed Flying-fox	<ul style="list-style-type: none"> • Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. • Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy. 	<ul style="list-style-type: none"> • Loss of roosting and foraging sites. • Electrocution on powerlines, entanglement in netting and on barbed-wire. • Heat stress. • Conflict with humans. • Incomplete knowledge of abundance and distribution across the species' range • Illegal shooting.

Common Name	Habitat and Ecology * #	Threats * #
	<ul style="list-style-type: none"> Individual camps may have tens of thousands of animals and are used for mating, and for giving birth and rearing young. Annual mating commences in January and conception occurs in April or May; a single young is born in October or November. Site fidelity to camps is high; some camps have been used for over a century. Can travel up to 50 km from the camp to forage; commuting distances are more often <20 km. Feed on the nectar and pollen of native trees, in particular Eucalyptus, Melaleuca and Banksia, and fruits of rainforest trees and vines. Also forage in cultivated gardens and fruit crops. 	
Yellow-bellied Sheath-tail-bat	<ul style="list-style-type: none"> Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. When foraging for insects, flies high and fast over the forest canopy, but lower in more open country. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory. Breeding has been recorded from December to mid-March, when a single young is born. Seasonal movements are unknown; there is speculation about a migration to southern Australia in late summer and autumn. 	<ul style="list-style-type: none"> Disturbance to roosting and summer breeding sites. Foraging habitats are being cleared for residential and agricultural developments, including clearing by residents within rural subdivisions. Loss of hollow-bearing trees; clearing and fragmentation of forest and woodland habitat. Pesticides and herbicides may reduce the availability of insects, or result in the accumulation of toxic residues in individuals' fat stores.
Eastern Coastal Free-tailed Bat	<ul style="list-style-type: none"> Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in man-made structures. Usually solitary but also recorded roosting communally, probably insectivorous. 	<ul style="list-style-type: none"> Loss of hollow-bearing trees. Loss of foraging habitat. Application of pesticides in or adjacent to foraging areas. Artificial light sources spilling onto foraging and/or roosting habitat Large scale wildfire or hazard reduction burns on foraging and/or roosting habitat

Sources:

* NSW Government Office of Environment and Heritage (OEH), 2022. Threatened species profiles. Accessed from <https://www.environment.nsw.gov.au/threatenedspeciesapp/>

Test of significance for determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats.

The following entities are assessed:

TECs:

- Inland Grey Box Woodland in the Riverina, NSW South Western Slopes, Cobar Peneplain, Nandewar and Brigalow Belt South Bioregions ('Inland Grey Box Woodland')

Threatened fauna:

- Little Lorikeet
- Superb Parrot
- Grey-crowned Babbler
- Koala
- Grey-headed Flying-fox
- Yellow-bellied Sheathtail-bat
- Eastern Coastal Free-tailed Bat.

(a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

Forest birds: Little Lorikeet, Superb Parrot, Grey-crowned Babbler

The proposed works are unlikely to have an adverse effect on the life cycle of these species such that a viable local population of the species is likely to be placed at risk of extinction as:

- The footprint of the impact is minor in comparison to available habitat.
- Habitat to be affected is degraded and/or small in area, with only three trees (one with hollows) and two shrubs requiring removal.
- The habitat to be impacted provides marginal habitat value for the species foraging requirements in a local context.
- The loss of a single hollow-bearing tree is unlikely to be critical to the Little Lorikeet or Superb Parrot in a local context, where tree hollows were observed in a tree immediately adjacent in the road reserve, on the site (tree#4) and on vacant land occupied by eucalypt woodland flanking the Newell Highway, west of the site.

Koala

The site provides a nominal area of foraging habitat (4 trees) which would not support a resident animal. On this basis, the site represents a small 'stepping-stone' of habitat within a larger fragmented habitat landscape and as a result the proposed works are unlikely to have an adverse effect on the life cycle of the Koala such that a viable local population of the species is likely to be placed at risk of extinction.

Grey-headed Flying-fox

The proposed works would require negligible loss of foraging resources and no roost habitat would be affected. On this basis it would be highly unlikely that an adverse effect on the life cycle of the subject species would occur such that a viable local population of the species is likely to be placed at risk of extinction.

Microbats: Yellow bellied Sheathtail bat, Eastern Coastal Free tailed Bat.

The proposal is unlikely to have an adverse impact on the life cycle of these species such that the viable local population of the species is likely to be placed at risk of extinction for the following reasons:

- The proposal will not exclude bats from currently available habitat as the works will not reduce foraging habitat.
- The loss of a single hollow-bearing tree is unlikely to represent critical roost habitat in a local context, where tree hollows were observed in a tree immediately adjacent in the road reserve, on the site (tree#4) and on vacant land occupied by eucalypt woodland flanking the Newell Highway, west of the site.
- The proposal will not disturb any breeding or maternity roosts.
- The ongoing operation of the site will not alter foraging or roosting habitat.

(b) In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

- (i) Is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**
- (ii) Is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.**

Inland Grey Box Woodland

The site has been historically cleared and a native ground layer and shrub layer is absent. Continued slashing maintenance suppresses any potential regeneration of the site, which is hindered by a dense exotic grass cover. The TEC extent is limited to the 4 Inland Grey Box (and associated shrubs) and groundcovers around the base of each tree. While the proposal will remove 3 of the 4 Inland Grey Box at the site, these impacts are negligible in a local context where this community is well represented to the west along the Newell Highway.

The proposal is unlikely to affect the extent or composition of this community to the extent that it is likely to be placed at risk of extinction as biodiversity impacts (loss of three trees and two shrubs) are negligible in the context of vegetation in the locality.

(c) In relation to the habitat of a threatened species or ecological community:

- (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and**

Inland Grey Box Woodland

This community is in poor condition and limited to individual isolated trees. The loss of vegetation for the proposal is negligible in the context of adjacent Grey Box woodland adjacent to the site along the Newell Highway.

Threatened Fauna

The minor nature of the works (site occupation, minor vegetation loss, noise and disturbance during operations) would not result in the significant loss or modification of habitat for any of the subject species.

- (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and**

Inland Grey Box Woodland

The site is already highly fragmented/disturbed from historic works. The proposal would not result in this TEC becoming substantially fragmented or isolated at a local scale.

Threatened Fauna

The relatively minor nature of the works (site occupation, minor vegetation loss, noise and disturbance during operations) would not fragment habitat for any of the subject species. The proposal will not restrict the dispersal of threatened species across the landscape, therefore there will be no ongoing impacts on the ability of individuals to disperse, socialise and breed.

- (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,**

Inland Grey Box Woodland

Inland Grey Box Woodland at the site is highly degraded and modified – this habitat, limited to single isolated trees, is not important in a local context.

Threatened Fauna

The vegetation to be removed is of low importance with regard to foraging, roosting or breeding habitat for any of the subject species.

- (d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),**

There are no declared areas of outstanding biodiversity value within the locality.

(e) whether the proposed development or activity constitutes or is part of a key threatening process or is likely to increase the impact of a key threatening process.

A key threatening process is listed in the *Biodiversity Conservation Act 2016* if it:

- adversely affects threatened species or ecological communities
- could cause species or ecological communities to become threatened.

The current list of key threatening processes (KTPs) and whether the proposal constitutes any KTPs, is summarised in **Table E.3**.

Table E.3 Key Threatening Process assessment

Key Threatening Processes (as per Schedule 4 of the BC Act)	Does the development or activity contribute towards a key threatening process?		
	Likely	Possibly	Unlikely
Aggressive exclusion of birds by noisy miners (<i>Manorina melanoccephala</i>)			✓
Alteration of habitat following subsidence due to longwall mining			✓
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands			✓
Anthropogenic climate change			✓
Bush rock removal			✓
Clearing of native vegetation	✓		
Competition and grazing by the feral European rabbit (<i>Oryctolagus cuniculus</i>)			✓
Competition and habitat degradation by feral goats (<i>Capra hircus</i>)			✓
Competition from feral honey bees (<i>Apis mellifera</i>)			✓
Death or injury to marine species following capture in shark control programs on ocean beaches			✓
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments			✓
Forest Eucalypt dieback associated with over-abundant psyllids and bell miners			✓
Habitat degradation and loss by Feral Horses			✓
High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition			✓
Herbivory and environmental degradation caused by feral deer			✓
Importation of red imported fire ants (<i>Solenopsis invicta</i>)			✓
Infection by psittacine circoviral (beak and feather) disease affecting endangered psittacine species and populations			✓
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis			✓
Infection of native plants by <i>Phytophthora cinnamomi</i>			✓
Introduction and Establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae			✓
Introduction of the large earth bumblebee (<i>Bombus terrestris</i>)			✓
Invasion and establishment of exotic vines and scramblers			✓
Invasion and establishment of Scotch broom (<i>Cytisus scoparius</i>)			✓
Invasion and establishment of the cane toad (<i>Bufo marinus</i>)			✓
Invasion of native plant communities by African Olive <i>Olea europaea</i> L. subsp. <i>cuspidata</i>			✓
Invasion, establishment and spread of <i>Lantana camara</i>			✓
Invasion of native plant communities by <i>Chrysanthemoides monilifera</i> (bitou bush and boneseed)			✓
Invasion of native plant communities by exotic perennial grasses			✓
Invasion of the yellow crazy ant (<i>Anoplolepis gracilipes</i> (Fr. Smith) into NSW			✓
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants			✓
Loss of hollow-bearing trees			✓
Loss or degradation (or both) of sites used for hill-topping by butterflies			✓
Predation and hybridisation of feral dogs (<i>Canis lupus familiaris</i>)			✓
Predation by the European red fox (<i>Vulpes vulpes</i>)			✓
Predation by the feral cat (<i>Felis catus</i>)			✓
Predation by <i>Gambusia holbrooki</i> (plague minnow or mosquito fish)			✓

Key Threatening Processes (as per Schedule 4 of the BC Act)	Does the development or activity contribute towards a key threatening process?		
	Likely	Possibly	Unlikely
Predation by the ship rat (<i>Rattus rattus</i>) on Lord Howe Island			✓
Predation, habitat degradation, competition and disease transmission by feral pigs (<i>Sus scrofa</i>)			✓
Removal of dead wood and dead trees			✓

The proposal is characteristic of the following KTPs:

- Clearing of native vegetation: As noted, five native trees (three mature Inland grey Box and two small saplings) would be removed for the works. The KTP 'clearing of native vegetation' defines clearing as "...the destruction of a sufficient proportion of one or more strata (layers) within a stand or stands of native vegetation so as to result in the loss, or long term modification, of the structure, composition and ecological function of stand or stands". Vegetation at the site is degraded, modified and fragmented and any structural elements have already been removed through historical clearing, weed invasion and ongoing maintenance by slashing. The minor nature of the works would not result in the loss, or long term modification of the structure, composition and ecological function of any native vegetation in proximity to the site.
- Loss of hollow-bearing trees: one hollow-bearing tree will be removed for the works, with one retained (tree#4). The loss of a single hollow-bearing tree is unlikely to significantly impact upon any hollow-dependent fauna in a local context.

Conclusion

The proposal is unlikely to result in a significant impact upon any of the entities assessed. Consequently, further consideration in the form of a BDAR is not required.



SUSTAINABILITY REPORT

NSW Rural Fire Services Infrastructure - Narrabri

1-9 Newell Hwy, Narrabri NSW 2390

PREPARED FOR

NSW Rural Fire Service care of NBRS
4 Murray Rose Avenue
Sydney Olympic Park NSW 2127

Ref: SY222002-SER01
Rev: 1
Date: 27.02.2024

1-9 Newell Hwy, Narrabri ESD

Revision Schedule

Date	Revision	Issue	Prepared By	Approved By
26.02.2024	Draft	Draft for review	B. Parker	S. Takac
27.02.2024	1	DA Submission	B. Parker	S. Takac

Northrop Consulting Engineers Pty Ltd

ACN 064 775 088 | ABN 81 094 433 100

Level 11, 345 George Street, Sydney NSW 2000

02 9241 4188 | sydney@northrop.com.au | www.northrop.com.au

© 2024 Northrop Consulting Engineers Pty Ltd. All rights reserved.

This document has been prepared on behalf of and for the exclusive use of NSW Rural Fire Services care of NBRS and is subject to and issued in accordance with the agreement between NSW Rural Fire Services care of NBRS and Northrop Consulting Engineers. Northrop Consulting Engineers accepts no liability or responsibility whatsoever for it in respect of any use of or reliance upon this document by any third party. Copying this document without the permission of NSW Rural Fire Services care of NBRS or Northrop Consulting Engineers is not permitted.

Table of Contents

Executive Summary	5
1. Introduction	6
1.1 Background	6
1.2 Scope	6
1.3 Limitations	6
1.4 Response to DCP	6
2. Ecologically Sustainable Development.....	7
2.1 Energy Efficiency:	7
2.1.1 Building fabric and glazing performance	7
2.1.2 Energy Metering and Monitoring	7
2.1.3 HVAC System Control.....	7
2.1.4 Highly efficient lighting system	7
2.1.5 Environmentally Friendly Refrigerants	7
2.1.6 Low Impact Materials Selections.....	7
2.2 Energy Generation:	7
2.3 Indoor Environment Quality.....	8
2.3.1 Daylight Access.....	8
2.3.2 Interior noise level control	8
2.3.3 Material selection	8
2.4 Sustainable Transport	8
2.4.1 End of Trip Facilities.....	8
2.5 Water Efficiency	8
2.5.1 Stormwater Management.....	8
2.5.2 Water efficient fixtures and fittings	8
2.6 Waste Management	9
2.6.1 Waste Management Plan	9
2.6.2 Separated Waste and Recycling Streams	9
2.6.3 Construction & Demolition Waste Minimisation	9
3. State Environment Planning Policies (SEPP) 2022.....	10
3.1 SEPP 2022 Requirements	10
4. Industry Best Practice	11
4.1 Management	11
4.2 Indoor Environment Quality.....	11
4.3 Energy	11
4.4 Transport	12

4.5	Water	12
4.6	Materials	12
4.7	Emissions	12
5.	Conclusion	13

Executive Summary

Northrop Consulting Engineers have been engaged to provide Sustainability Consulting advice to NSW Rural Fire Service care of NBRF to support the Development Application process for the proposed development at 1-9 Newell Hwy, Narrabri NSW 2390. This report demonstrates how the design of the proposed development aligns to sustainability objectives set out in the Narrabri Shire Council's Development Control Plan (DCP) and the Sustainable Buildings State Environmental Planning Policies (SEPP) 2022. The project seeks to meet and exceed the sustainable requirements set for non-residential developments. These requirements are met through the following key design initiatives:

- A commitment to energy efficiency exceeding the requirements of Section J of the Building Code of Australia.
- A highly efficient façade wall-glazing system designed to minimise heat gains into the building while promoting the entry of daylight for the areas occupied during the day.
- Reduction of potable water use.
- The use of highly efficient and high WELS rated sanitary fixtures and fittings.
- A PV Solar array to contribute to renewable energy supply and reduce reliance on the grid.

The integration of these initiatives demonstrates a strong social and environmental commitments of the project which is in line with the Narrabri Shire Council's development guidelines, aligning the project to an Australian Excellence Sustainability Standard and effectively addressing and mitigating against the negative environmental, social, and economic impacts associated with the project. The proposed building initiatives provide a cost-effective solution in design, construction and operation and the design team is committed to further pursuing the goals of sustainable development across this site as the project progresses.

1. Introduction

1.1 Background

NSW Rural Fire Services care of NBRIS has engaged Northrop Consulting Engineers to complete an Ecologically Sustainable Development Report for the proposed development at 1-9 Newell Hwy, Narrabri, in line with the documentation required as part of the development application.

To ensure that the development meets the requirements of the Department of Planning Narrabri Shire Council and aligns with the NSW Rural Fire Service's commitment to sustainability, this report has examined the design documentation and the project's connection to the surrounding area. Northrop has then examined the Ecologically Sustainable Design (ESD) principles that have been incorporated into the project design and provided guidance on further initiatives to be considered throughout the project's detailed design. This report lays out the site approach to sustainability and refers to the applicable elements of the planning requirements.

1.2 Scope

Northrop Consulting Engineers have been engaged by NSW Rural Fire Services care of NBRIS to provide a Sustainability Report that will outline how the project meets the relevant planning requirements. The following sections of this report will identify the ESD principles of the construction, and its relation to the Development Control Plan (DCP), and State Environmental Planning Policies (SEPP) 2022 requirements relevant to the area.

1.3 Limitations

Due care and skill has been exercised in the preparation of this report.

No responsibility or liability to any third party is accepted for any loss or damage arising out of the use of this report by any third party. Any third party wishing to act upon any material contained in this report should first contact Northrop for detailed advice, which will take into account that party's particular requirements.

1.4 Response to DCP

This sustainability report is created to support the DA Application for this project. The relevant sections of the Narrabri Shire Council's DCPs were considered, however no specific sustainability requirements were identified. Therefore, this report will primarily address the SEPP 2022 requirements.

2. Ecologically Sustainable Development

2.1 Energy Efficiency:

Energy efficiency will be considered throughout the design development process with the following improvements to be considered by the design team. It is expected that the measures outlined in the following section, alongside a large solar array, will significantly reduce the site's grid electricity demands when compared to a standard practice building.

2.1.1 Building fabric and glazing performance

The building envelope makes use of well-designed glazing and building materials to assist the projects targets for energy efficiency, acoustic performance, and thermal comfort.

The design will aim to minimise heat gains throughout summer and reduce the overall demand for artificial lighting through the integration of good daylighting throughout the building.

2.1.2 Energy Metering and Monitoring

An energy metering and monitoring strategy will be implemented to effectively monitor the main energy uses within the building as per the requirements of Section J9D3 in the NCC 2022.

2.1.3 HVAC System Control

The proposed HVAC system will provide thermal comfort and acceptable indoor air quality to individual areas of the site. The project will look to select a HVAC system with a higher seasonal energy efficiency ratio (SEER) rating when compared to Section J/ Minimum Energy Performance Standards (MEPS) requirements.

2.1.4 Highly efficient lighting system

Efficient lighting systems including LED lighting throughout the building will reduce the overall energy consumption of the building. LED lights are up to 80% more efficient than traditional fluorescent lights and are characterized by an extended lifespan contributing to a reduction in carbon emissions. They are also efficient in dissipating heat and therefore reduce the heat load experienced within conditioned spaces.

2.1.5 Environmentally Friendly Refrigerants

Where required, the use of Environmentally friendly refrigerants, such as hydrofluorocarbons (HFC's), are targeted within the project to minimise global warming potential and ozone depletion potential.

2.1.6 Low Impact Materials Selections

Embodied energy will be reduced by avoiding unnecessary use of materials and procuring materials with a low carbon footprint where appropriate. Steel and concrete suppliers with environmental product disclosures (EPDs) will be preferred to support the improvement of industry standards and transparency of information on material impacts.

2.2 Energy Generation:

With the above energy efficiency measures, the energy load of the facility will be significantly reduced, allowing a large portion of the sites electrical energy demand to be met through onsite renewable energy generation from a PV array. This will assist to both offset the sites energy use and minimise the sites daytime peak demand from the grid.

2.3 Indoor Environment Quality

Indoor environment quality is always an important consideration in spaces that are regularly occupied. The following considerations have been considered as part of the building design:

2.3.1 Daylight Access

Daylighting systems will be integrated throughout the internal and external areas of this project to support the admission of natural light and direct sunlight throughout the design. This will be achieved using high Visible Light Transmission (VLT) windows where possible. An integrated daylight approach will improve the wellbeing of the building occupants by creating a visually stimulating environment. The provision of daylight will reduce the overall energy consumption of the building as the natural light will alleviate the need for artificial lighting whilst the direct sunlight will enhance thermal comfort during cooler months.

2.3.2 Interior noise level control

Internal noise levels will be actively considered with the building layout and systems design considering how noise will reverberate through the building. The use of acoustic insulation and sound isolation will ensure that interior noise levels to be maintained below acceptable limits.

2.3.3 Material selection

Materials selection for the project aims to improve the internal environment of the site with materials with low volatile organic compound and formaldehyde content preferred to help minimise respiratory issues for building occupants.

2.4 Sustainable Transport

2.4.1 End of Trip Facilities

End of trip facilities, including lockers and showers, will be provided to encourage walking and cycling by staff.

2.5 Water Efficiency

A strong focus has been put on the effective management of water within the building with the following initiatives being included in the design in all areas throughout the project.

2.5.1 Stormwater Management

Stormwater management has been actively addressed through the design, including the incorporation of an on-site detention basin/wetland treatment to slow the peak flow of stormwater runoff with adjoining turf swales and rainwater tanks for rainwater capture. Further, soft landscaping and permeable surfaces have been included where feasible to increase infiltration.

2.5.2 Water efficient fixtures and fittings

Water Efficient fixtures and fitting will reduce the water consumption of the site. As an indication, the following should be targeted:

Table 1: Sanitary Fixture Efficiency

Fixture / Equipment Type	WELS Rating
Taps	5 Star
Urinals	5 Star

Fixture / Equipment Type	WELS Rating
Toilet	4 Star
Showers	3 Star
Clothes Washing Machines	4 Star
Dishwashers	5 Star

2.6 Waste Management

Effective waste management throughout construction and operation of the site will help to promote resource efficiency and minimise the adverse environmental impacts of the project. The following are being considered as part of the design process.

2.6.1 Waste Management Plan

A Waste Management Plan will be prepared with the following key objectives:

1. To minimise the environmental impacts of the operations of the development.
2. To minimise the impact of the management of waste within the development.
3. To ensure waste is managed to reduce the amount landfilled and to minimise the overall quantity generated.
4. To ensure appropriate storage and collection of waste.

These objectives will be achieved through strategies such as the integration of recycling bins and back-of-house separation areas, which will encourage recycling and separation of cardboard/paper waste, glass, food waste and comingled recycling and general waste.

2.6.2 Separated Waste and Recycling Streams

The provision of separated waste and recycling streams could allow for more effective recycling of the project's operation waste. Providing separate bins for cardboard/paper waste, glass, food wastes, comingled recycling and general waste will improve the buildings operational efficiency and result in significant environmental benefits.

2.6.3 Construction & Demolition Waste Minimisation

The project should look to minimise the construction waste associated with the project and is aiming to divert over 80% of waste from landfill to recycling or reuse facilities.

3. State Environment Planning Policies (SEPP) 2022

3.1 SEPP 2022 Requirements

The SEPP 2022 outlines new requirements to allow projects to reduce greenhouse gas emissions. This section specifically addresses the following sustainability objectives for non-residential buildings.

Reference	Objective	Design Response
General Sustainability	Reporting on general performance, including water conservation, waste minimization and use of renewable energy.	<ul style="list-style-type: none"> Energy metering and monitoring strategy will be implemented to effectively monitor the main energy uses within the building. The project is also aiming to divert construction and demolition waste from landfill. Installation of PV array to generate renewable energy and reduce energy usage from the grid
Embodied Emissions Reporting	Implement processes of measuring and reporting on embodied emissions.	<ul style="list-style-type: none"> Disclose embodied emissions via the NABERS embodied emission material form.
Net Zero Provisions	Demonstrate at development application that the development is designed with sufficient space and infrastructure so all energy needs can be sourced from renewables by 2035.	<ul style="list-style-type: none"> The project is not a large commercial development and is not required to meet this objective.
Energy Performance and Offsets	<p>Independently verify that the development has met the energy performance required by the NCC, through NABERS post occupancy assurance.</p> <p>Purchase offsets for onsite fossil fuel use and to rectify any performance gap for energy efficiency</p>	<ul style="list-style-type: none"> The project is not a large commercial development and is not required to meet this objective.
Water Performance	Independently verify that the development has met a minimum 3-star NABERS water rating.	<ul style="list-style-type: none"> The project is not a large commercial development and is not required to meet this objective.

4. Industry Best Practice

The project also aims to meet and exceed industry best practice sustainability requirements within its design as part of the sustainability commitments associated with construction and operation. This section provides a summary of how the project is incorporating best practice in line with elements drawn from the Green Building Council of Australia (GBCA). These elements provide a benchmark for the project to industry best practice.

4.1 Management

The management category promotes the adoption of environmental principals in project inception, design, and construction phases, through to commissioning and operation of the building. The following initiatives are currently proposed.

- Engagement of an ESD professional to advise the Project team throughout the project design and construction.
- Review of the project design to ensure maintenance and access provisions are incorporated at the early stages of design.
- Commitment to commissioning the building.
- Integration of measures to accommodate risks posed to the site due to expected alterations in climate.
- Provision of detailed Operations and Maintenance information and hand over to support ongoing operations.
- Metering of the main building elements to support reporting and optimisation of the project systems in operation.
- Consideration of the operational waste requirements for the site and integration of support for this within the space layouts.

4.2 Indoor Environment Quality

The Indoor Environment Quality category aims to enhance the comfort and wellbeing of building occupants. The following proposed initiatives relate to building's HVAC system, lighting, indoor air pollutant monitoring systems as well as other building attributes:

- Building services noise levels to be managed to achieve acoustically comfortable spaces.
- Low irritant materials and coatings to be used.
- LED lighting are proposed throughout the development to meet illuminance, uniformity and glare requirements in applicable areas
- A mechanical system that promotes good thermal comfort in the conditioned spaces.

4.3 Energy

The energy category rewards projects for reducing energy consumption and greenhouse gas emissions through more efficient building fabrics and systems as well as on site energy generation. The following initiatives are proposed:

- Inclusion of solar arrays as part of the building design.
- Incorporation of an efficient heating and cooling system.
- Building fabrics that exceed the requirements of the construction code.

4.4 Transport

The transport category awards points for projects which make provisions for reduced greenhouse gas emissions arising from occupant travel to and from a building. The following initiatives are proposed for implementation:

- Provision of end-of-trip facilities to promote the use of alternative modes of transportation.

4.5 Water

This category rewards projects which reduce the amount of potable water consumed on-site through the design of efficient systems. The following initiatives are proposed for the project.

- Inclusion of highly efficient fixtures and fittings
- Rainwater tanks proposed for water reuse in end use flushing and irrigation.

4.6 Materials

The materials category focuses on reducing the consumption of resources through selection and reuse of products, and efficient management practices. The following initiatives are proposed within the building:

- The use of paints adhesives, sealants, and carpets are low in TVOC or non-toxic
- The use of low TVOC or non-toxic engineered wood products
- Minimising occupant exposure to banned or highly toxic materials

4.7 Emissions

The emissions category targets building emissions relating to watercourse pollution, light pollution, ozone depletion and global warming. The following initiatives are currently proposed:

- All thermal insulants in the project will aim to avoid the use of ozone depleting substances in both its manufacture and composition.
- To reduce light pollution, no direct light generated inside or outside the building will face directly upward into the sky.

5. Conclusion

This report has addressed the requirements outlined in the projects governing objectives and describes on how the project demonstrates its strong commitment to design excellence in sustainability incorporated within its design, construction, and operation.

The significant design initiatives the project is intending to include are as follows:

- A commitment to energy efficiency exceeding the requirements of Section J of the Building Code of Australia.
- A highly efficient façade wall-glazing system designed to minimise heat gains into the building while promoting the entry of daylight for the areas occupied during the day.
- Reduction of potable water use.
- The use of highly efficient and high WELS rated sanitary fixtures and fittings.
- A PV Solar array to contribute to renewable energy supply and reduce reliance on the grid.

The integration of these initiatives demonstrates a strong social and environmental commitments of the project which is in line with the Department of Planning and Narrabri Shire Council's development requirements. Through the implementation of the proposed initiatives listed in this report, the project aligns to an Australian Best Practice Standard which effectively addresses and mitigates against environmental, social, and economic impacts associated with the site. The proposed design looks to provide a cost-effective solution in design, construction and operation and NSW Rural Fire service care of NBRS is committed to further pursuing the goals of sustainable development across this site.

OPERATIONAL WASTE MANAGEMENT PLAN

NSW RURAL FIRE SERVICE - NAMOI GWYDIR FIRE CONTROL CENTRE

02 08 2023

Rev A

SITE LOCATION

The proposed Namoi Gwydir Fire Control Centre site is located on the outskirts of the Narrabri township in north-western New South Wales. The locality functions as an industrial precinct and has good access to the regional road network via the Newell Highway and the Kamilaroi Highway.

EXISTING SITE DESCRIPTION

The site for the Namoi Gwydir Fire Control Centre (FCC) is on a relatively flat vacant lot identified as Lot 8 DP 1212638. The address is 1-9 Newell Highway, Narrabri, NSW 2390. The 1.938 ha site is triangular and is bounded by the Newell Highway to the west, the Old Newell Highway to the south-east, and the Mungundi Rail to Werris Creek Line on the north-eastern side.

The site is located opposite an existing Rural Fire Control Centre which is co-located with Council's Operations Depot on the Old Newell Highway. A 24-hour heavy vehicle self-service fuel station is located next to the Council Depot. The Old Newell Highway currently terminates at the railway line, however Council is proposing to reopen this road at a level crossing to facilitate access to grain storage silos off Turrawan Road, east of the railway line.

DESIGN PROPOSAL

The design requires the removal of stockpile mounds, scrub vegetation and trees affecting helicopter approach and take-off flight paths for the proposed helipad. Given the relatively flat nature of the site, existing levels shall be re-worked to create high points at the front site boundary with falls via swales to the east and west of the proposed buildings towards an on-site stormwater detention basin in the northern corner of the site.

The proposed development consist of a helipad and three buildings; a Fire Control Centre (FCC) with a communications tower, a Stores building serving the FCC, and a Rural Fire Brigade (RFB) station. There are 54 car parking spaces, and an allowance for an additional 34 vehicles in overflow parking zones. The design incorporates a driveway with hardstands and turning bays to facilitate the manoeuvring of two heavy vehicle types through the site; an 8.8 m long Medium Rigid Vehicle (MRV) Category 1 fire truck and a 20 m long Articulated Vehicle (AV). The Stores building will have 5 fire truck spaces, and the RFB will have 3 fire truck spaces. During normal operations, the site will have a maximum occupancy of 75 people, however this may increase to 100 people during operational campaign events.

DESIGN & CONSTRUCT CONTRACT

The project shall be tendered by selected design & construct contractors on a 100% complete set of documents. Estimates of demolition and construction waste shall be confirmed by the contractor. The contract documentation shall require that the contractor disposes of waste in accordance with all relevant statutory requirements.

OPERATIONAL WASTE

AIM: to promote strong sustainability outcomes during the operation of the facility during its lifecycle. The major principles are (i) responsible source separation, (ii) adequate waste handling provisions and (iii) comply with all relevant council codes and guidelines. This OWMP will be integrated into the overall management of the facility and clearly communicated to all relevant stakeholders.

The figures presented are estimates only as the amount of waste produced is dependent on the intensity of use of the building. As a Rural Fire Service (RFS) centre, this is of course seasonal to a large degree.

The major items of waste generation at the RFS facility shall include:

- Recyclable dry paper waste from admin offices, training rooms and multi-purpose rooms
- Perishable and recycle waste from the staff dining areas
- Comingled recyclable and garbage waste from warehousing and storage areas
- Sanitary products from female WC's
- Garden waste

STAKEHOLDER ROLES AND RESPONSIBILITIES

Role	Responsibilities
Centre operator	<ul style="list-style-type: none"> • Providing staff/contractors with equipment manuals, training, health and safety procedures, risk assessments, and PPE to control hazards associated with all waste management activities • Ensure safety of staff and visitors • Abide by all relevant regulations and guidelines • Clean and maintain bins • Clean and maintain bin storage area • Organize waste pick-ups as necessary
Staff / Visitors	<ul style="list-style-type: none"> • Dispose of all waste in the bins provided • Separate waste to the appropriate bins
Narrabri Shire Council waste collection service	<ul style="list-style-type: none"> • Provide regular bin collections
Gardener	<ul style="list-style-type: none"> • Remove all garden waste generated for recycling off site

ESTIMATED WASTE VOLUMES AND PROVISIONS

The garbage generation rates in the table below are based on the Victorian State Government's calculation rates for commercial development waste and recycling. Reference: <https://calculators.sustainability.vic.gov.au/mud-waste-management>.

Area type	GFA (m ²)	Garbage generation rate (L/100m ² /day)	Generated Garbage (L/wk)	Recycling generation rate (L/100m ² /day)	Generated recycling (L/wk)
Education/Training	179	5	63	5	63
Office/Canteen	697	10	488	10	488
Warehouse/Store	812	10	568	10	568
	1688		1119		1119

BIN SUMMARY

Based on the estimated volume of waste generated by the facility in the above table and advice received from Council's waste services manager stating that Council provide a weekly collection service for garbage and fortnightly for recycling, the recommended bin quantities and servicing frequencies are as follows:

General waste: 5 x 240 L MGBs collected weekly

Recycling: 10 x 240 L MGBs collected fortnightly

It is recommended that at least 5 x 240 L MGBs for recycling are allocated for paper/cardboard, and the remaining recycling bins are allocated for commingled recyclables as required. Bin sizes, quantities, and/or collection frequencies may be modified by the building manager once the proposed development is operational.

WASTE DISPOSAL PROCEDURES

Perishable waste 240 litre bins (red) and recyclable waste 240 litre bins (yellow) shall be distributed around the site in strategic locations. Prior to the scheduled bin collection day, the bins will be taken by staff members to the external bin store.

Food handling for cooked or prepared food that is served and consumed on site will produce a typical waste composition of food scraps from plates, packaging waste and some plastics. Staff frequenting the BBQ area and other meal rooms will be responsible for their own back of house (BOH) waste management during daily operations.

To ensure the proper management and disposal of waste, the operator must be made aware of the following practices:

- All general waste should be bagged, and garbage bins should be plastic-lined.
- Bagging of recyclables is not permitted.
- All interim waste storage is located BOH during operations.
- All flattened cardboard will be collected and removed to the allocated storage bin.

Washrooms

Sanitary bins to be provided and collected by an appropriate contractor. Hand dryers shall be provided to negate paper hand towel waste.

BIN STORAGE

The external Bin Store is located to the east of the RFB on a designated strip of concrete pavement adjacent to the facility's driveway exit gate. It shall accommodate the MGBs outlined above and additional skip bins as required by the operator. The Bin Store area is 33 m². Refer Architectural drawings 102, 201, and 213.

WASTE COLLECTION PROCEDURE

It is anticipated that a Council contractor will enter the facility via truck and empty the waste and recycling bins from the external bin store location as per Council's bin collection procedure outlined above.



View north of the Project Area in Narrabri NSW.

ABORIGINAL DUE DILIGENCE ASSESSMENT REPORT

NARRABRI FIRE CONTROL CENTRE

NARRABRI LOCAL GOVERNMENT AREA, NSW

JUNE 2023

Report prepared by
OzArk Environment & Heritage
for NSW Rural Fire Service (RFS)



OzArk Environment & Heritage

145 Wingewarra St
(PO Box 2069)
Dubbo NSW 2830

Phone: (02) 6882 0118

Fax: (02) 6882 0630

enquiry@ozarkehm.com.au

www.ozarkehm.com.au

This page has intentionally been left blank.

DOCUMENT CONTROLS

Proponent	NSW Rural Fire Service (RFS)	
Client	NSW Public Works	
Document Description	Aboriginal Due Diligence Assessment Report: Narrabri Fire Control Centre	
File Location	OzArk Job No.	
Clients\NSW Public Works\Narrabri Fire Control Centre April2023\Report	3839	
Document Status: V3.0 FINAL		Date: 27 June 2023
Draft V1: OzArk internal edits		V1.0 EM author 22/6/23 V1.1 JB review 23/6/23 V1.3 EM edit 23/6/23
Draft V2: OzArk and client edits		V2.0 OzArk to client 23/6/23 Client response: no edits 27/6/23
Final V3: Final document		V3.0 OzArk to client 27/6/23
Prepared for		Prepared by
Peter Hughes Senior Project Manager NSW Public Works Peter.hughes@pwa.nsw.gov.au C/- fiona@gainsford.com.au		Eleanore Martin Archaeologist OzArk Environment & Heritage 145 Wingewarra Street (PO Box 2069) Dubbo NSW 2830 P: 02 6882 0118 Eleanore@ozarkehm.com.au
COPYRIGHT		
© OzArk Environment & Heritage 2023 and © NSW Rural Fire Service 2023		
All intellectual property and copyright reserved.		
Apart from any fair dealing for private study, research, criticism, or review, as permitted under the Copyright Act, 1968, no part of this report may be reproduced, transmitted, stored in a retrieval system, or adapted in any form or by any means (electronic, mechanical, photocopying, recording, or otherwise) without written permission.		
Enquiries should be addressed to OzArk Environment & Heritage.		

Acknowledgement

OzArk acknowledge the traditional custodians of the area on which this assessment took place and pay respect to their beliefs, cultural heritage, and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the Elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

EXECUTIVE SUMMARY

OzArk Environment & Heritage (OzArk) has been engaged by NSW Public Works (the client), on behalf of NSW Rural Fire Services (RFS) (the proponent) to complete an Aboriginal due diligence heritage assessment for the Narrabri Fire Control Centre (the Project), in Narrabri.

The Project Area is located at 1-9 Newell Highway Narrabri, NSW, (Lot 8 DP 1212638) on a triangular land parcel owned by the Narrabri Shire Council with an area of approximately 1.8 hectares (ha). The property is bounded to the west by the Newell Highway, the Old Newell Highway to the southeast and the Mungundl to Werris Creek Rail Line on the north-eastern boundary.

A search of the Aboriginal Heritage Information Management System (AHIMS) shows there are no previously recorded Aboriginal sites within the Project Area. However, the proponent identified one tree with potential cultural modifications when assessing the site. As such, the assessment progressed to a visual inspection.

A visual inspection of the Project Area was undertaken on 23 May 2023 by OzArk Project Archaeologist Harrison Rochford and assisted by Kristie Toomey representing the Narrabri Local Aboriginal Land Council (LALC). No Aboriginal sites were identified within the Project Area. A tree with scarring on it was examined during the visual inspection and it was assessed that it did not meet the criteria for scarred tree registration. This tree is however of importance to the local Aboriginal community and has been recorded as a community interest tree. This tree is located in the southwestern most corner of the Project Area and will be avoided during construction of the proposed Fire Control Centre (**Section 3**).

The undertaking of the due diligence process resulted in the conclusion that the proposed works will have an impact on the ground surface but will not harm Aboriginal objects.

The proposed works may proceed at the Narrabri Fire Control Centre location without further archaeological investigation under the following conditions:

1. The management measures described in **Section 4** must be enacted to minimise the risk of inadvertent harm to the community interest tree.
2. All staff and contractors involved in the proposed work should be made aware of the legislative protection requirements for all Aboriginal sites and objects.
3. All land and ground disturbing activities must be confined to within the assessed Project Area to eliminate the risk of harm to Aboriginal objects in adjacent landforms. Should the parameters of the proposal extend beyond the assessed areas, then further archaeological assessment may be required.

4. This assessment has concluded that there is a low likelihood that the proposed work will adversely harm Aboriginal cultural heritage items or sites. If during works, however, Aboriginal artefacts or skeletal material are noted, all work should cease and the procedures in the *Unanticipated Finds Protocol* (**Appendix 2**) should be followed.
5. Inductions for work crews should include a cultural heritage awareness procedure to ensure they recognise Aboriginal artefacts (see **Appendix 3**) and are aware of the legislative protection of Aboriginal objects under the National Parks and Wildlife Act and the contents of the *Unanticipated Finds Protocol*.

The information presented here meets the requirements of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*. It should be retained as shelf documentation for five years as it may be used to support a defence against prosecution in the event of unanticipated harm to Aboriginal objects.

CONTENTS

EXECUTIVE SUMMARY.....	III
1 INTRODUCTION	1
1.1 Brief description of the project.....	1
1.2 Project Area	3
1.3 Assessment approach	3
2 ABORIGINAL DUE DILIGENCE ASSESSMENT	5
2.1 Introduction.....	5
2.2 Defences under the NPW Regulation 2019.....	5
2.2.1 Low impact activities	5
2.2.2 Disturbed lands.....	5
2.3 Application of the Due Diligence Code of Practice.....	6
2.3.1 Step 1	6
2.3.2 Step 2a	7
2.3.3 Step 2b	9
2.3.4 Step 2c	13
2.3.5 Step 3	13
2.3.6 Step 4	14
2.4 Conclusion.....	16
3 ABORIGINAL HERITAGE SITE OF INTEREST RECORDED	18
Community interest tree	18
3.1 Likely impacts to Aboriginal heritage from the Project.....	21
4 MANAGEMENT MEASURES	21
5 MANAGEMENT RECOMMENDATIONS	22
REFERENCES	23
PLATES.....	25
APPENDIX 1: AHIMS SEARCH RESULTS	29
APPENDIX 2: ABORIGINAL HERITAGE: UNANTICIPATED FINDS PROTOCOL	33
APPENDIX 3: ABORIGINAL HERITAGE: ARTEFACT IDENTIFICATION.....	34

FIGURES

Figure 1-1: Map showing the location of the Project.....	2
--	---

Figure 1-2: Conceptual scope of proposed works for the Narrabri Fire Control Centre (made by NBRS 2022).....	2
Figure 1-3: Aerial showing the Project Area.	4
Figure 2-1: Previously recorded sites in relation to the Project Area.....	8
Figure 2-2: Survey coverage within the Project Area.....	15
Figure 3-1: Community interest tree.	18
Figure 3-2: Location of community interest tree in relation to the Project Area.	20
Figure 4-1: Aerial of Project Area with the location of community interest tree and the proposed temporary high visibility fencing.	21

TABLES

Table 2-1: Determination of whether Due Diligence Code of Practice applies.	6
Table 2-2: Site types and frequencies of AHIMS sites near the Project Area.	7
Table 2-5: Due Diligence Code of Practice application.....	17
Table 3-1: Community interest tree.	18

PLATES

Plate 1: View northeast of mown grasses within the Project Area.	25
Plate 2: View southwest of Project Area.....	25
Plate 3: View east of Project Area. Note the long grasses.....	26
Plate 4: View of centre of Project Area. Note the long grasses.....	26
Plate 5: View of man-made drainage feature in the centre of the Project Area.	27
Plate 6: View of the branch tear on the mature tree.	27
Plate 7: View of proposed vehicle damage on mature tree.....	28

1 INTRODUCTION

1.1 BRIEF DESCRIPTION OF THE PROJECT

OzArk Environment & Heritage (OzArk) has been engaged by NSW Public Works (the client), on behalf of NSW Rural Fire Services (RFS) (the proponent) to complete an Aboriginal due diligence heritage assessment for the Narrabri Fire Control Centre (the Project). The Project is situated in the Narrabri Local Government Area (LGA) (**Figure 1-1**).

The proposed works form part of a review conducted by the proponent in partnership with the Narrabri Council for suitable sites for future Fire Control Centres. The conceptual scope of proposed work (**Figure 1-2**) includes the construction of the following:

- A fire control centre
- A radio control tower
- A helipad
- Storage buildings
- Parking areas

Additionally, the operation facilities are likely to include:

- 24/7 hours of operation
- Staffing: 10-15 people, peak 100 people in emergency
- Sustainability elements: Solar part of the scope 30kW
- Operations:
 - No vehicle maintenance would occur on site
 - No refuelling would occur on site
 - Kitchen facilities would be limited to reheating and basic preparation only.

1.2 PROJECT AREA

The Project Area is located at 1-9 Newell Highway Narrabri, NSW, at lot 8 DP 1212638 as shown on **Figure 1-1**. The Project Area is situated on a triangular land parcel owned by the Narrabri Shire Council with an area of approximately 1.8 hectares (ha). The property is bounded to the west by the Newell Highway, the Old Newell Highway to the southeast and the Mungundi Rail to Werris Creek Line on the north-eastern boundary (**Figure 1-3**).

The Project Area is located opposite an existing Rural Fire Control Centre and the Council's Operation Depot on the Old Newell Highway. Additionally, a 24-hour heavy vehicle self-serve fuel station is located next to the Council Depot.

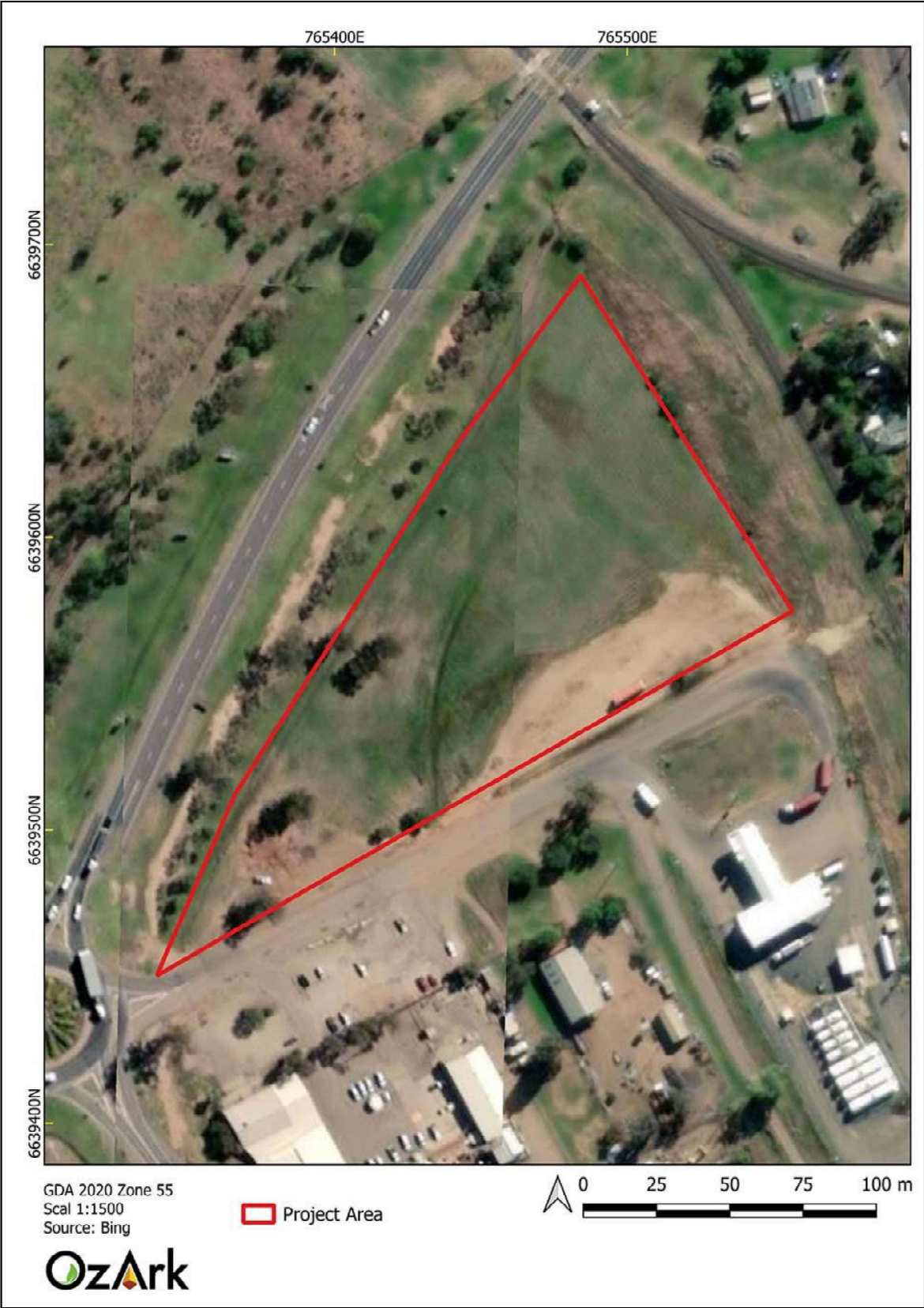
The Project Area consists of relatively flat land, mostly cleared of vegetation, with only a few scattered, mature trees located in the south-western most portion of the Project Area.

1.3 ASSESSMENT APPROACH

Aboriginal cultural heritage

The desktop and visual inspection component for the study area follows the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (due diligence; DECCW 2010). The field inspection followed the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales* (OEH 2011).

Figure 1-3: Aerial showing the Project Area.



2 ABORIGINAL DUE DILIGENCE ASSESSMENT

2.1 INTRODUCTION

Section 57 of the National Parks and Wildlife Regulation 2019 (NPW Regulation) made under the *National Parks and Wildlife Act 1974* (NPW Act) advocates a due diligence process to determine likely impacts on Aboriginal objects. Carrying out due diligence provides a defence to the offence of harming Aboriginal objects and is an important step in satisfying Aboriginal heritage obligations in NSW.

2.2 DEFENCES UNDER THE NPW REGULATION 2019

2.2.1 Low impact activities

The first step before application of the due diligence process itself is to determine whether the proposed activity is a “low impact activity” for which there is a defence in the NPW Regulation. The exemptions are listed in Section 58 of the NPW Regulation (DECCW 2010: 6).

The activities of the proponent are not considered a ‘low impact activity’ and the due diligence process applies.

2.2.2 Disturbed lands

Relevant to this process is the assessed levels of previous land-use disturbance.

The NPW Regulation Section 58 (DECCW 2010: 18) define disturbed land as follows:

Land is disturbed if it has been the subject of a human activity that has changed the land’s surface, being changes that remain clear and observable.

Examples include ploughing, construction of rural infrastructure (such as dams and fences), construction of roads, trails and tracks (including fire trails and tracks and walking tracks), clearing vegetation, construction of buildings and the erection of other structures, construction or installation of utilities and other similar services (such as above or below ground electrical infrastructure, water or sewerage pipelines, stormwater drainage and other similar infrastructure) and construction of earthworks.

The Project is predominantly situated on landforms where there are clear and observable changes to the landscape (**Figure 1-3**). Due to vegetation clearance, the proposed works could be considered as occurring almost entirely on ‘disturbed land’. However, portions of the Project Area, particularly near the remaining vegetation, have not been changed in a clear and observable manner and the due diligence process must be applied.

In summary, it is determined that the Project must be assessed under the Due Diligence Code of Practice. The reasoning for this determination is set out in **Table 2-1**.

Table 2-1: Determination of whether Due Diligence Code of Practice applies.

Item	Reasoning	Answer
Is the activity to be assessed under Division 4.7 (state significant development) or Division 5.2 (state significant infrastructure) of the EP&A Act?	The Project will be assessed under Part 4 of the EP&A Act.	No
Is the activity exempt from the NPW Act or NPW Regulation?	The Project is not exempt under this Act or Regulation.	No
Do either or both apply: Is the activity in an Aboriginal place? Have previous investigations that meet the requirements of this Code identified Aboriginal objects?	The activity will not occur in an Aboriginal place. No previous investigations have been undertaken for this Project.	No
Is the activity a low impact one for which there is a defence in the NPW Regulation?	The Project is not a low impact activity for which there is a defence in the NPW Regulation.	No
Is the activity occurring entirely within areas that are assessed as 'disturbed lands'?	The Project is not entirely within areas of high modification.	No
Due Diligence Code of Practice assessment is required		

2.3 APPLICATION OF THE DUE DILIGENCE CODE OF PRACTICE TO THE PROJECT

To follow the generic due diligence process, a series of steps in a question/answer flowchart format (DECCW 2010: 10) are applied to the proposed impacts and the Project Area, and the responses documented.

2.3.1 Step 1

Will the activity disturb the ground surface or any culturally modified trees?

Yes, the Project will impact the ground surface and may impact culturally modified trees.

The proposed works will include earthworks, service installation, construction and commissioning. In undertaking the proposed works to construct the Fire Control Centre and associated infrastructure, the ground surface will be significantly disturbed by specialised machinery.

Aerial imagery shows there are mature trees present within the south-western portion of the Project Area which will be affected by the proposed works (**Figure 1-3**). Additionally, the proponent has identified that a tree within the scope of the proposed works may contain cultural modifications and have specifically requested this tree be inspected. As such, the Project may impact culturally modified trees, if they are present, or may require the implementation of management measures to avoid.

2.3.2 Step 2a

Are there any relevant confirmed site records or other associated landscape feature information on AHIMS?

No, there are no previously recorded sites within or nearby the Project Area.

A search of the Aboriginal Heritage Information Management System (AHIMS) database was completed on 5 May 2023 over a 10 kilometre (km) by 10 km search area centred on the Project Area (GDA 2020 Zone 55 Eastings: 755397.361 – 775395.719; Northings: 6629555.587 – 6649440.959 with no buffer). The search returned 78 previously recorded Aboriginal sites. None of the previously recorded sites are situated within or near the Project Area. The closest previously recorded is a culturally modified tree located approximately 1 km east of the Project Area, on the eastern banks of the Namoi River.

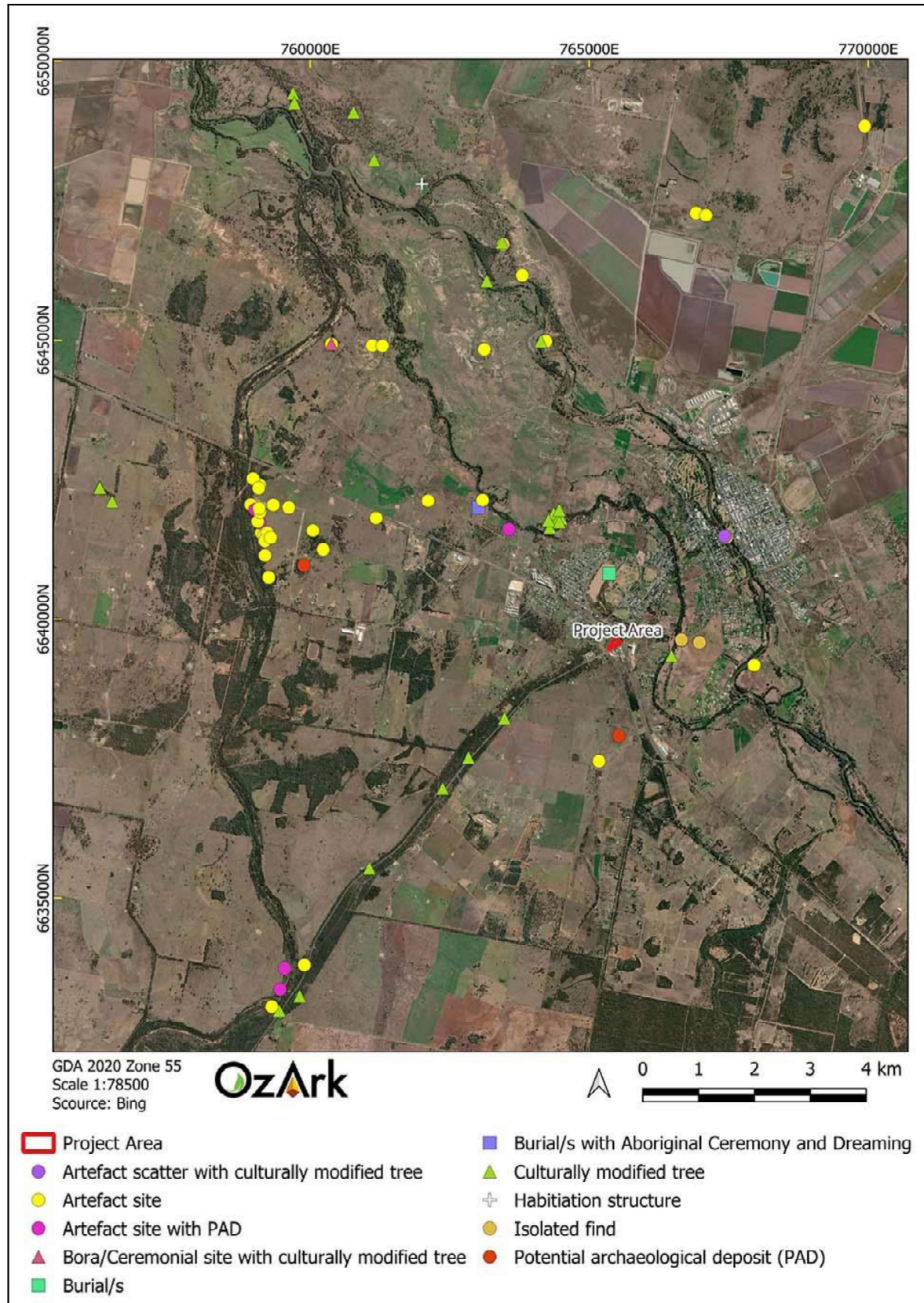
Figure 2-1 shows all previously recorded sites in relation to the Project Area and **Table 2-2** shows the types of sites that are close to the Project Area.

The results of the AHIMS search shows that artefact sites are the most common site type contributing to 43.6% of all site types within the vicinity of the Project Area (**Table 2-2**). This site type predominantly occurs within 500 m of a watercourse or drainage feature and the artefact sites over 500 m from water source appear in aerials to be situated on elevated landforms.

The second most recorded site type within the search area are culturally modified trees which contribute 34.6% of all site types within the vicinity of the Project Area (**Table 2-2**). This site type has been predominantly recorded within 500 m of the Namoi River or a named creek.

Table 2-2: Site types and frequencies of AHIMS sites near the Project Area.

Site Type	Number	% Frequency
Artefact Site	34	43.6
Culturally Modified Tree	27	34.6
Artefact Site with PAD	5	6.4
Isolated Find	5	6.4
PAD	2	2.6
Artefact Scatter with Culturally Modified Tree	1	1.3
Bora/Ceremonial site with Culturally Modified Tree	1	1.3
Burial/s	1	1.3
Burial/s with Aboriginal Ceremony and Dreaming	1	1.3
Habitation Structure	1	1.3
Total	78	100

Figure 2-1: Previously recorded sites in relation to the Project Area.

2.3.3 Step 2b

Are there any other sources of information of which a person is already aware?

Yes, the proponent has identified one tree with potential cultural modifications and have requested a visual inspection of this tree.

2.3.3.1 *Ethno-historic context*

According to Tindale (1974) and Horton (1996), the Project Area falls within the limits of the lands occupied by the Kamilaroi tribe. The name Narrabri is derived from an Aboriginal word, meaning 'Forked Waters'. The Kamilaroi tribal area extends from Walgett, NSW to Nindigully, QLD and includes areas near Talwood and Garah at Moree, Mungindi, Mogil Mogil, Narrabri, Pilliga, Gunnedah, Bingara, Tamworth, Quirindi, Bundella, Barraba, Gwabegar and Come-by-Chance; on headwaters of the Hunter River (Tindale 1974). The current Project Area is located within the centre of the Kamilaroi tribal territory.

Prior to European settlement, the Kamilaroi people practiced a hunting, gathering and fishing economy with the Naomi River and the Gwydir River providing an abundance of resources. The Traditional Owners caught a variety of freshwater species including fish, eels, crayfish, yabbies, turtles and mussels using fishing lines and nets made from reed fibres. Watercraft were manufactured from large slabs of bark cut from the native River Red Gum trees. Away from the freshwater sources, the Kamilaroi people hunted kangaroos, wallabies, koalas, possums, echidnas, emus, lizards, snakes and frogs. Plant foods included grass seeds, wild orange, emu apple, melons, tubers, yams and roots. It is highly probable that the vegetation structure which existed prior to European occupation was a result of Aboriginal land management practices such as controlled burning (Appleton 2009).

Following Oxley's European 'discovery'¹ of the Liverpool Plains in 1817, a runaway convict George Clarke ("The Barber") began the first European settlement of the Boggabri area (c.1828 to his capture in 1831). According to historical reports Clarke made first contact with local Aboriginal people and was adopted into the Aboriginal community (Dunlop *et al.* 1957 as cited in Hamm 2005).

In 1831, Mitchell's exploring party, following Clarke's route, came across the Leard Forest. Their native guide "Mr Brown" noticed axe markings called "Mogo" on a number of trees which he described as a sign 'to keep away' (O'Rourke 1995). For further information Michael O'Rourke details an account of Mitchell's crossing in *Raw Possum and Salted Port: Major Mitchell and the Kamilaroi* (O'Rourke 1995).

¹ 'discovery' to the NSW government's knowledge.

The early 1830s saw the expansion of European settlement into northern New South Wales including Narrabri and its close surroundings with the first squatting settlement run 'Nurrabry' taken up in 1834 (Hunt 1998). Continued settlement in the region lead to violent interactions between the Europeans and the Kamilaroi. Aboriginal people were shot, poisoned and displaced from their land by pastoral settlers and, in retaliation, cattle, sheep, stockmen and shepherds were speared. Historical sources record a rapid decline in Kamilaroi numbers associated with the dispossession of land and the subsequent destruction of native habitats and social networks. Overall, European settlement of the region caused immense disruption and change to Aboriginal social and economic life and relationships to country.

2.3.3.2 *Regional archaeological context*

On a broader perspective (Liverpool Plains District) the available data indicates variable use of the local landforms, with known sites indicating ephemeral, casual or limited use, and other sites showing more intensive or repeated use. The most frequent site type recorded in the broader region is the small open camp site, which is most often found on level, well drained terrain close to permanent water. Artefacts on these sites usually number less than 50, although the site size appears to be greatly affected by ground surface visibility conditions at the time of recording. Some sites are associated with grinding grooves and/or modified trees. Relevant studies within the broader region will be briefly reviewed below.

Silcox and Bowdler (1982) completed a survey for the proposed 132kV Transmission Line Route from Walgett to Narrabri. The survey area was approximately 180 km in length with a 45 metres (m) easement along the entire route. A total of 15 sites were recorded during the survey including seven isolated finds, four scarred trees, two open campsites and two possible hearths. Stone artefacts identified as isolated finds and within the open campsites included flakes, blades, backed blades, cores, a grinding stone containing two grooves and a possible scraper. These artefacts were largely comprised of chert (yellow, brown, pink and mottled yellow/orange), quartz, silcrete, ironstone and basalt. Silcox and Bowdler returned to the survey area later in 1982 to conduct excavations and surface collection of one of the recorded open campsites, WN6. They noted upon return to the site the amount and density of material had significantly decreased due to natural and man-made disturbances.

In 2007, Australian Archaeological Survey Consultants (AASC) completed a survey for Narrabri Coal Operations for extensions to the Narrabri Coal Project located approximately 20 km south of Narrabri. The survey was concentrated on the areas known as the Pit Top Survey Area and the Ventilation Shaft Survey Area. A total of seven sites were recorded during the survey consisting of two isolated finds, two artefact scatters, two scarred trees and one resource site exhibiting a native food resource: wild orange tree. A majority of the newly recorded sites were located within close proximity to Kurrajong Creek which bisects the north-eastern quarter of the

Pit Top Survey Area. The banks of Kurrajong Creek were noted as being the least disturbed by intensive agricultural activity and therefore sites recorded along the creek retained some of its archaeological integrity and context.

Appleton (2008) returned to the area to conduct salvage operations at Rocglen Coal Mine, following his 2002 survey of the site of the proposed Belmont Coal Mine. The salvage area consisted of three locations situated 25 km north of Gunnedah, between Vickery State Forest and Wean Road. Appleton (2002) had previously noted artefacts, including a silcrete core at Site "B1", a micro-debitage scatter of eight small silcrete flakes at Site "B2", and an extended artefact scatter (over 40 artefacts consisting of three cores, with the remainder flaked pieces and flakes) at Site "B3". The salvage operation noted significant disturbance between 2002 and 2008 caused by agricultural activity or storms and slope-wash. Additional artefacts were recovered at "B1" (eight stone artefacts, no cores), at "B2" (13 stone artefacts), and at "B3" (67 artefacts, including three cores). Appleton interpreted the 'Rocglen Assemblage' as a camping area to which various groups returned over an extended period of time.

Appleton (2009) completed a survey for the Narrabri Coal Operations "Longwall Project" located about 30 km southeast of Narrabri, nearby the Kamilaroi Highway. The assessment entailed a survey over four main areas comprising the impact zones. A total of 121 sites were identified across all four survey areas located on a variety of landforms. Forty-three sites were recorded in the first survey area, 69 sites recorded in the second, nine recorded in the third and no sites recorded within the fourth survey area. Overall, most sites comprised low density artefact scatters with only four per cent of artefact scatters containing more than 20 artefacts. A scarred tree and a hearth were also identified within the first survey area. Higher density artefact scatters, the scarred tree and hearth were all recorded along ephemeral and permanent watercourses, including Pine Creek and Kurrajong Creek.

More Recently, OzArk (2020a) completed an Aboriginal Heritage Study across the Narrabri LGA. In formulating a predictive model for site location, OzArk (2020) used a higher-level classification within the Mitchell landscape units to describe the landscapes within the Narrabri area. Landscapes were divided into the following types:

- Sands, outwash sands and aeolian sands
- Alluvial plains
- Channels and floodplains
- Plateaus
- Ranges
- Slopes and plains
- Swamps and lagoons
- Tops

- Uplands

Previously recorded AHIMS sites were plotted against these landscape types and the following observations made:

- A high number of sites were on alluvial plains (n=196), uplands (n=163) and channels and flood plains (n= 110).
- There were a moderate number of sites in slopes and plains (n=47) and sands, outwash sands and aeolian sands landscape types (18).
- There was a low number of sites in Tops (n=3)
- There were no previously recorded sites on plateaus, ranges or swamps and lagoon landforms.

OzArk (2020a) additionally considered 'combined accumulated impact' using data from the Aboriginal Sites Decision Support Tool (ASDST) to calculate the impacts of colonial land use on Aboriginal site features in a landscape. The combined accumulated impact was divided into five categories: high, moderate – high, moderate, moderate – low, and low. High accumulated impact was associated with areas of mining, dense urban area, or areas that had been cleared and regularly cropped. Low accumulated impact areas included areas such as long-established natural parks, rangelands, or where agricultural practices were restricted to livestock grazing. Previously recorded AHIMS sites were plotted against these combined accumulated impact areas and the following observations were made:

- There are high proportions of AHIMS sites recorded in areas of moderate to low (n=302, 56%) or moderate (n=191, 36%) impact areas.
- Only seven percent of AHIMS sites are in areas categorised as having moderate to high or high accumulated impacts.
- There are no sites recorded in areas categorised as low accumulated impacts as the areas that meet the criteria for this impact type is so little.

2.3.3.3 *Local archaeological context*

Previous archaeological surveys and development driven reports have been conducted in the Narrabri area. These reports provide data which can be used to better understand the Aboriginal archaeological context of the Project Area.

Westport Road and Newell Highway Intersection Upgrade (OzArk 2015)

In 2015, OzArk undertook an Aboriginal heritage due diligence assessment for upgrade works to the Newell Highway and Westport Road intersection. The area assessed in this report is situated approximately 13 km southwest of the Project Area. A visual inspection of the study area recorded no Aboriginal sites. The lack of sites was attributed to the small size of the study area, distance to a water source and the significant disturbance to the area from the construction of two roads.

Northern NSW Inland Port (OzArk 2020b)

OzArk (2020b) completed an Aboriginal Cultural Heritage Assessment identifying opportunities for future planning of the Northern NSW Inland Port. The study area was located across five properties and covered around 434 ha in Narrabri NSW, approximately 5 km west of the Project Area. Eighteen previously unrecorded Aboriginal sites consisting of isolated find site types (n=7) and artefact scatters (n=11) were recorded within the study area. All of the artefact scatters were located within 300 m of Bohena Creek and the majority of sites were recorded within the channel and floodplain landscape type, with only four sites recorded on an alluvial plain. Additionally, the artefacts were made from the raw materials quartz, chert, quartzite, silcrete and chalcedony.

Newell Highway Widening – Narrabri to Coonabarabran (OzArk 2022)

This assessment included 78 kms of the Newell Highway road corridor between Narrabri and Coonabarabran, on both sides of the highway. As a result of this assessment, which commenced within 1 km south of the Project Area, eight Aboriginal scarred trees were recorded.

Implications for this report:

Early documentation by colonial settlers, as well as recent heritage surveys around the local area, both indicate that modified scarred trees are a common site type within the region and as there are mature trees bearing scars present within the Project Area, this site type may be present.

Previous archaeological studies (Silcox & Bowdler 1982; Appleton 2008, Appleton 2009; OzArk 2020b) indicate that artefact sites (artefact scatters and isolated finds) are the most common site type within the Narrabri LGA. It is also indicated in these studies that these sites are dominantly situated within 200 m of a water source. The Project Area is distant (over 200 m) from a watercourse, therefore, the likelihood of artefact-based Aboriginal sites being present is reduced.

2.3.4 Step 2c

Are there any landscape features that are likely to indicate presence of Aboriginal objects?

No, the Project Area does not contain landforms with identified archaeological sensitivity.

The Project Area is not located within 200 m of a watercourse or drainage feature. The closest permanent watercourse is Mooloolaba Creek approximately 296 m north of the Project Area. Consequently, there is an overall lower potential to record Aboriginal objects in the Project Area.

2.3.5 Step 3

Can harm to Aboriginal objects or disturbance of archaeologically sensitive landscape features be avoided?

No landforms with identified archaeological sensitivity will be impacted by the Project.

Although no previously recorded Aboriginal sites or areas of archaeological sensitivity are present, the proponent identified a possible culturally modified tree within the Project Area. The identification of a potential scarred tree, in this case, instigates the need to proceed to visual inspection of the Project Area.

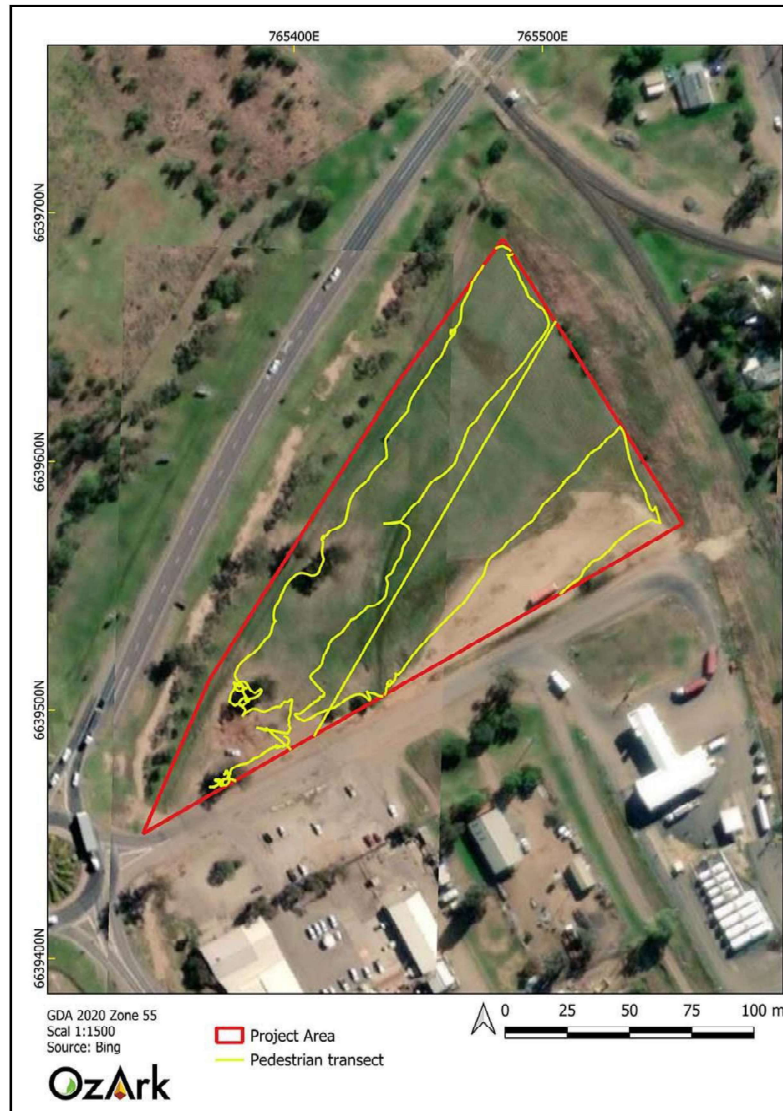
2.3.6 Step 4

Does a desktop assessment and visual inspection confirm that there are Aboriginal objects or that they are likely?

Yes, there are Aboriginal objects within the Project Area, but these will not be impacted by the Project.

The visual inspection of the Project Area was undertaken by OzArk Project Archaeologist Harrison Rochford and assisted by Kristie Toomey representing the Narrabri Local Aboriginal Land Council (LALC) on 23 May 2023.

Standard archaeological field survey and recording methods were employed to ground-truth levels of disturbance and to assess the archaeological potential of landforms. All mature, native vegetation within the Project Area was inspected for cultural modification. No Aboriginal scarred trees were recorded in the Project Area, however one tree with scarring was identified by the Aboriginal community as a tree of interest. The pedestrian tracks were captured via handheld GPS as shown on **Figure 2-2**.

Figure 2-2: Survey coverage within the Project Area.

Ground surface visibility (GSV) across the Project Area was generally around 80% due to maintenance works including mowing and public use as a roadway and parking place (**Plate 1** and **Plate 2**). GSV decreased to approximately 10% in overgrown grassy areas (**Plate 3** and **Plate 4**). Additionally, a potential man-made channel / drainage feature during the visual inspection runs north-south through the Project Area (**Plate 5**).

Discussion

Two scars were present on the tree identified by the proponent as being of potential cultural significance. Assessment of these scars against the accepted criteria for scarred tree identification (Long 2003) indicates that the scars are not of cultural origin and are more likely the result of impact or branch tears (**Plate 6** and **Plate 7**). This tree was identified by Kristie Toomey as being of importance to local Aboriginal community. This tree is situated nearby the proposed fence line and an existing stockpile mound. This stockpile will be removed by Narrabri Shire

Council as part of the proposed works. To prevent harm to this community interest tree, management measures will need to be implemented and the proposed fence line may have to be altered, depending on how close it is to the trunk of the tree. Management measures to ensure the preservation of the tree are detailed in **Section 4**.

A 'no' answer for Step 4, results in the following outcome (DECCW 2010):

AHIP (Aboriginal Heritage Impact Permit) application not necessary. Proceed with caution. If any Aboriginal objects are found, stop work and notify Heritage NSW (02) 9873 8500 (heritagemailbox@environment.nsw.gov.au). If human remains are found, stop work, secure the site and notify NSW Police and Heritage NSW.

2.4 CONCLUSION

The due diligence process has resulted in the outcome that further investigation and an impact assessment is not required. The management measures in **Section 4** of this report are presented to ensure preservation of the community interest tree. The reasoning behind this determination is set out in **Table 2-3**.

Table 2-3: Due Diligence Code of Practice application.

Step	Reasoning	Answer
Step 1 Will the activity disturb the ground surface or any culturally modified trees?	The proposed works will disturb the ground surface through earthworks, grazing and works associated with construction. The Project will impact some mature, native vegetation, however, the community interest tree will be avoided.	Yes
If the answer to Step 1 is 'yes', proceed to Step 2		
Step 2a Are there any relevant records of Aboriginal heritage on AHIMS to indicate presence of Aboriginal objects?	AHIMS indicated that there are no Aboriginal sites within or nearby the Project Area.	No
Step 2b Are there other sources of information to indicate presence of Aboriginal objects?	Yes, it was possible that modified trees were present. Field inspection confirmed this tree as not containing cultural modification	Yes
Step 2c Will the activity impact landforms with archaeological sensitivity as defined by the Due Diligence Code?	Landforms with identified archaeological sensitivity are not present in the Project Area.	No
If the answer to any stage of Step 2 is 'yes', proceed to Step 3		
Step 3 Can harm to Aboriginal objects listed on AHIMS or identified by other sources of information and/or can the carrying out of the activity at the relevant landscape features be avoided?	The Project will not impact previously recorded Aboriginal objects or landforms with archaeological sensitivity as identified in the Due Diligence Code. However, as the proponent has identified a tree of potential cultural significance the due diligence process applies.	No
If the answer to Step 3 is 'no', a visual inspection is required. Proceed to Step 4.		
Step 4 Does the visual inspection confirm that there are Aboriginal objects or that they are likely?	The visual inspection recorded no Aboriginal objects in the Project Area. One community interest tree was recorded, and this tree can be avoided by Project impacts	No
Conclusion		
AHIP not necessary. Proceed with caution.		

3 ABORIGINAL HERITAGE SITE OF INTEREST RECORDED

Table 3-1: Community interest tree.

Site Name	Coordinates (GDA 2020 zone 55) (Centre point)	Site type	Artefact Count	Site Dimensions (m)
Community interest tree	765367 E; 6639469 N	community interest tree	1	3 m x 3 m

Community interest tree

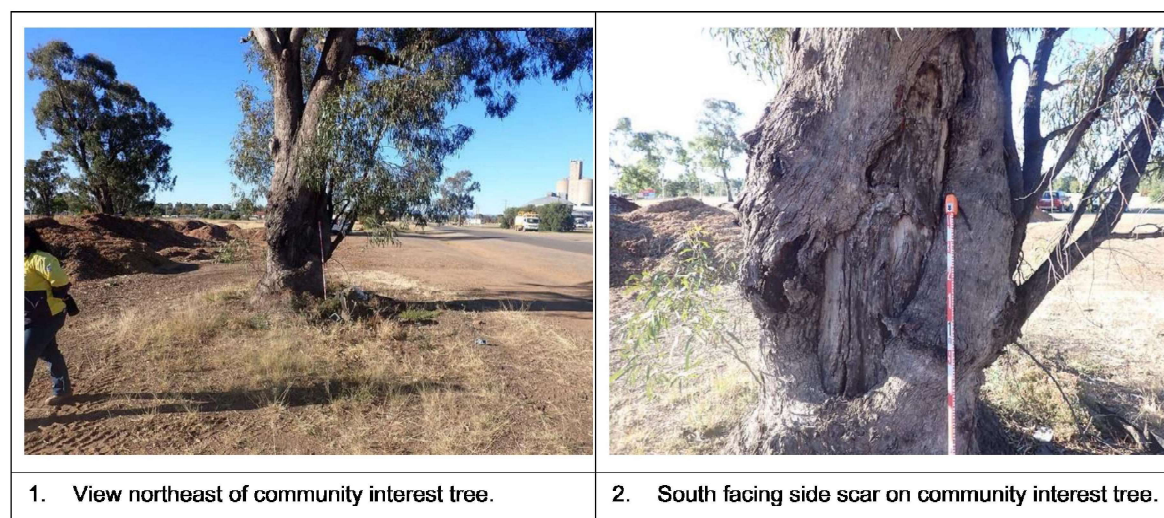
Site Type: Tree of interest to the Aboriginal community.

GPS coordinates: GDA 2020 Zone 55, Easting: 765367; Northing: 6639469

Location of Site: The tree is located on a plain landform, approximately 50 m northeast of the Old Newell Highway and Newell Highway round about (**Figure 3-1**). The tree is adjacent to the Narrabri Headquarters Rural Fire Brigade Depot on land owned by the Narrabri Shire Council, on the edges of the West Narrabri township.

Description of Site: The tree consists of one scar on the south facing side with a width of 70 cm, a height of 125 cm and a depth of 30 cm. The tree also has a scar on the north facing side with a width of 25 cm, a height of 125 cm and a depth of 20 cm. The scars do not conform to the accepted characteristics of cultural modification scars and is not considered by OzArk to be an Aboriginal object. The Aboriginal community representatives would prefer, however, that this tree was not harmed as a precautionary measure.

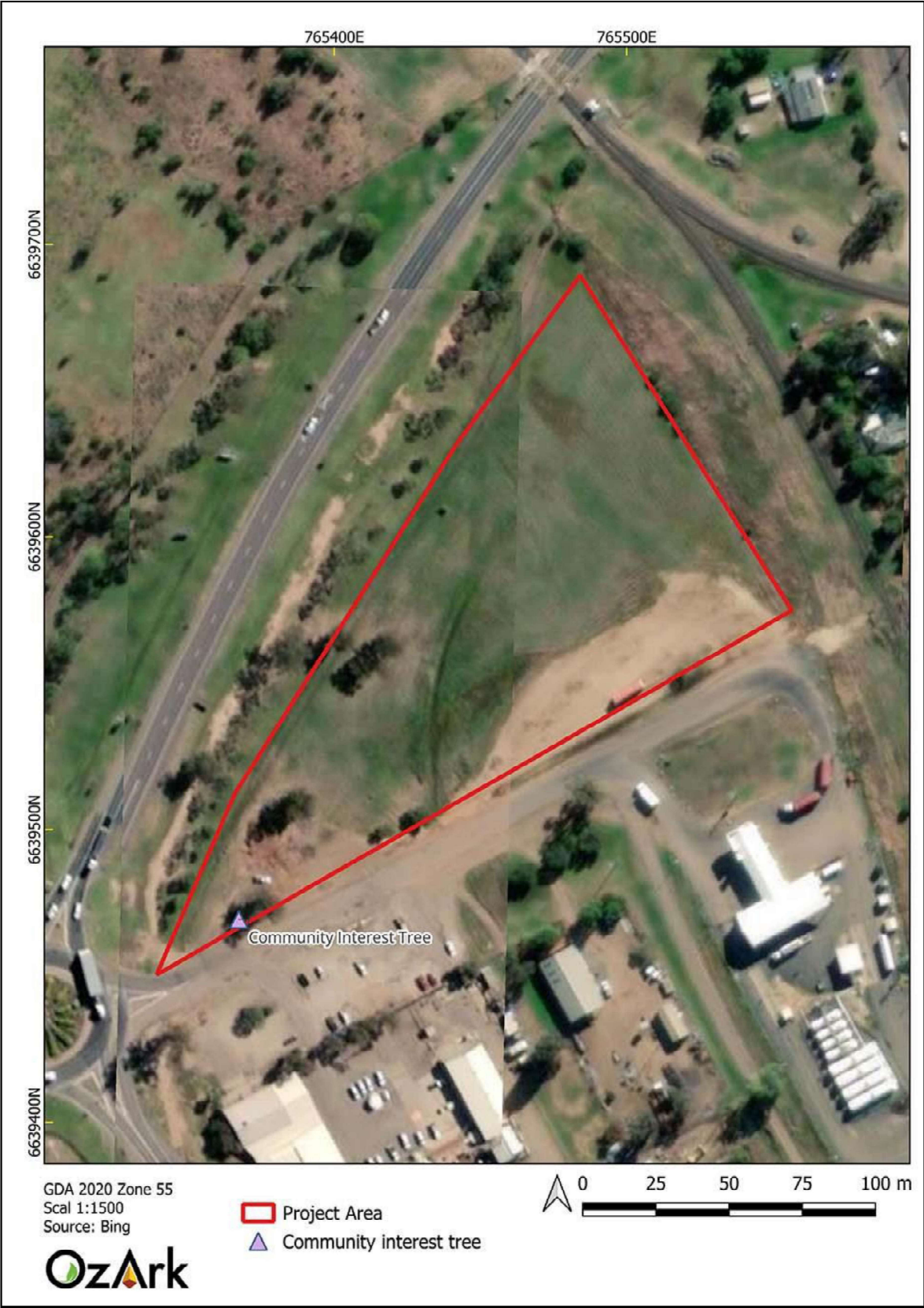
Figure 3-1: Community interest tree.





3. North facing side scar on community interest tree.

Figure 3-2: Location of community interest tree in relation to the Project Area.



3.1 LIKELY IMPACTS TO ABORIGINAL HERITAGE FROM THE PROJECT

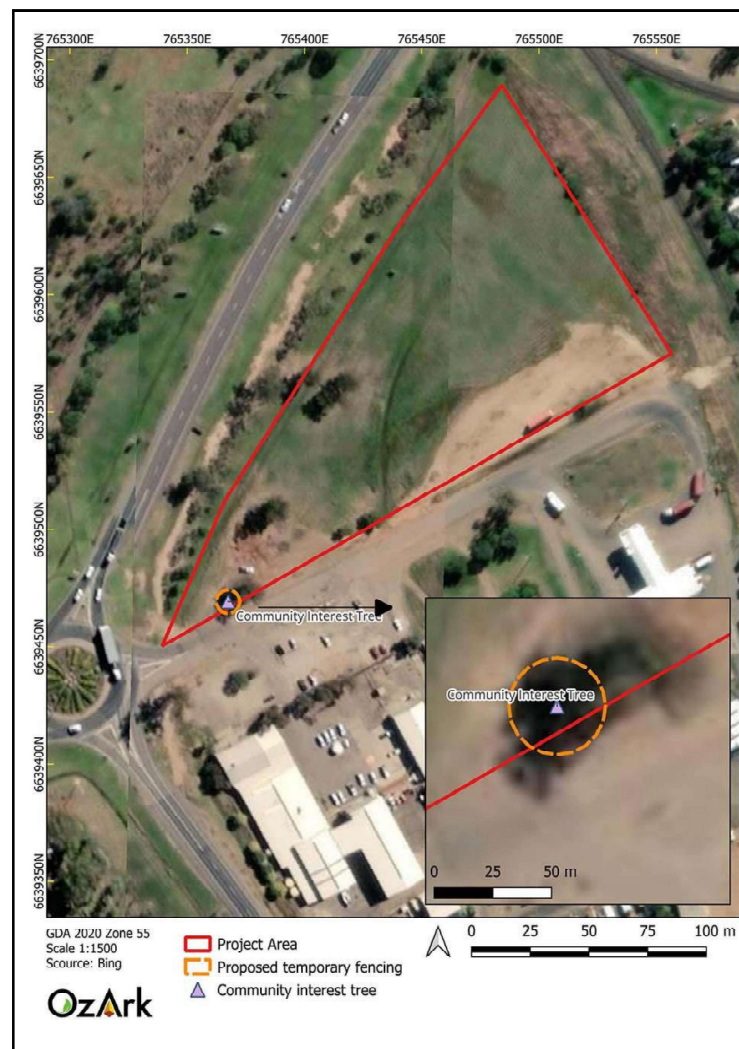
As no Aboriginal objects were identified there will be no impacts to Aboriginal heritage as a result of the project. The community interest tree will be avoided by project impacts.

4 MANAGEMENT MEASURES

The community interest tree is within the Project Area although it will not be harmed by the proposed works, so long as the management measures set out below are adhered to. These measures will also ensure that no inadvertent harm is caused during construction.

Prior to the removal of the stockpile by the Narrabri Shire Council and the start of construction, temporary high visibility fencing should be installed with a 5 m minimum radius around the tree (Figure 4-1). The boundary should 'fence-out' the proposed works to minimise the risk of inadvertent harm to the tree. The fencing should be sturdy enough to remain in place throughout the construction phase.

Figure 4-1: Aerial of Project Area with the location of community interest tree and the proposed temporary high visibility fencing.



5 MANAGEMENT RECOMMENDATIONS

The undertaking of the due diligence process resulted in the conclusion that the proposed works will have an impact on the ground surface but will not harm Aboriginal objects.

The recorded community interest tree can be avoided by the proposed works using protective measures. As such, an Aboriginal Heritage Impact Permit (AHIP) is not required if the following conditions are followed.

The proposed works may proceed at the Narrabri Fire Control Centre location without further archaeological investigation under the following conditions:

1. The management measures described in **Section 4** must be enacted to minimise the risk of inadvertent harm to the community interest tree.
2. All staff and contractors involved in the proposed work should be made aware of the legislative protection requirements for all Aboriginal sites and objects.
3. All land and ground disturbing activities must be confined to within the assessed Project Area to eliminate the risk of harm to Aboriginal objects in adjacent landforms. Should the parameters of the proposal extend beyond the assessed areas, then further archaeological assessment may be required.
4. This assessment has concluded that there is a low likelihood that the proposed work will adversely harm Aboriginal cultural heritage items or sites. If during works, however, Aboriginal artefacts or skeletal material are noted, all work should cease and the procedures in the *Unanticipated Finds Protocol* (**Appendix 2**) should be followed.
5. Inductions for work crews should include a cultural heritage awareness procedure to ensure they recognise Aboriginal artefacts (see **Appendix 3**) and are aware of the legislative protection of Aboriginal objects under the National Parks and Wildlife Act and the contents of the *Unanticipated Finds Protocol*.

The information presented here meets the requirements of the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales*. It should be retained as shelf documentation for five years as it may be used to support a defence against prosecution in the event of unanticipated harm to Aboriginal objects.

REFERENCES

- Appleton 2008 Appleton J. 2008. *The archaeological salvage of three open sites Under Part 3A approval Rocglen Coal Mine, north of Gunnedah, northern NSW*. Report to: Whitehaven Coal Mining Ltd.
- Appleton 2009 Appleton J. 2009. *Narrabri Coal Mine Longwall Stage 2 Project*. Report to: Whitehaven Coal Mining Ltd.
- Burra Charter 2013 International Council on Monuments and Sites 2013. *The Burra Charter: The Australia ICOMOS Charter for Places of Cultural Significance*.
- DECCW 2010 DECCW. 2010. *Due Dillgence Code of Practice for the Protection of Aboriginal Objects in NSW*. Department of Environment, Climate Change and Water, Sydney.
- Hamm 2005 Hamm G. 2005. *Boggabri Coal Project: Aboriginal Cultural Heritage Assessment Report*. A report by Cultural Heritage Consultant Archaeological Risk Assessment Services to Idemitsu Boggabri Coal Pty Limited.
- Horton 1996 Horton, D. 1996. *The AIATIS Map of Indigenous Australia*. The Australian Institute for Aboriginal and Torres Strait Islander Studies, Canberra.
- Hunt 1998 Hunt GL. 1998. *When Narrabri was young: A history of Narrabri 1818–1900*. Narrabri Municipal Council.
- Mitchell 2002 Mitchell, Dr. Peter. 2002. *Description for NSW (Mitchell) Landscapes Version 2*. Department of Environment and Climate Change NSW.
- O'Rourke 1995 O'Rourke M 1995. *Raw Possum and Salted Pork: Major Mitchell and the Kamilaroi*. Plowpress.
- OEH 2011 Office of Environment and Heritage. 2011. *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales*. Department of Environment, Climate Change and Water, Sydney.
- OzArk 2015 OzArk Environment and Heritage. 2015. *Aboriginal Heritage Due Diligence Assessment: Westport Road and Newell Highway Intersection Upgrade*. Report to: Narrabri Shire Council.
- OzArk 2022 OzArk Environment and Heritage. 2022. *Archaeological Survey Report: Coonabarabran to Narrabri – Newell Highway Widening*. Report to: ARUP on behalf of Transport for NSW

- Silcox and Bowdler 1982 Silcox R and Bowdler S. 1982. *An archaeological survey of a proposed 132Kv transmission line route from Walgett to Narrabri. Part 1.* Report to: Electricity Commission of New South Wales.
- Tindale 1974 Tindale, N.B. 1974. *The Aboriginal Tribes of Australia.* ANU Press, Canberra.

PLATES



Plate 1: View northeast of mown grasses within the Project Area.



Plate 2: View southwest of Project Area.



Plate 3: View east of Project Area. Note the long grasses.



Plate 4: View of centre of Project Area. Note the long grasses.



Plate 5: View of man-made drainage feature in the centre of the Project Area.




Plate 6: View of the branch tear on the mature tree.



Plate 7: View of proposed vehicle damage on mature tree.

APPENDIX 1: AHIMS SEARCH RESULTS



AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Narrabri fire


Client Service ID : 779328

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
19-3-0199	Narrabri Logistics Hub OS-09 (NLH OS-09)	GDA	55	759122	6641544	Open site	Valid	Artefact : -		104335
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo, Doctor Alyce Cameron							
19-3-0246	Narrabri SAP PAD 01	GDA	55	759088	6640965	Open site	Valid	Potential Archaeological Deposit (PAD) : -	Permits	
	Contact	Recorders	ERM Australia Pty Ltd - Sydney CBD, Ms. Lorien Perchard							
19-3-0180	NB-AS-17	GDA	55	759093	6633002	Open site	Valid	Artefact : -	Permits	
	Contact	Recorders	Mr. Neville Baker, Sydney Water - Parramatta							
19-3-0202	Narrabri Logistics Hub IF-01 (NLH IF-01)	GDA	55	760231	6641248	Open site	Valid	Artefact : -		104335
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo, Doctor Alyce Cameron							
19-3-0018	WN20 Narrabri;	AGD	55	760379	6644930	Open site	Valid	Artefact : -	Open Camp Site	84
	Contact	Recorders	Rex Silcox							
19-3-0007	Narrabri Junction; Namoi Farm;	AGD	55	767055	6639171	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders	Brown							
19-3-0073	TRINDALL'S TSR - CORE	AGD	55	763460	6646717	Open site	Valid	Artefact : 1	Permits	
	Contact	Recorders	Mr. B Trindall							
19-3-0218	C2N ST-01	GDA	55	763483	6638221	Open site	Valid	Modified Tree (Carved or Scarred) : -	Permits	
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo, Mr. Brendan Fisher							
19-3-0136	Collins Park site 1 artefact	GDA	55	767458	6641465	Open site	Valid	Artefact : 1	Permits	
	Contact	Recorders	Mr. Allison Stewart							
19-3-0203	Narrabri Logistics Hub IF-02 (NLH IF-02)	GDA	55	760048	6641585	Open site	Valid	Artefact : -		104335
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo, Doctor Alyce Cameron							
19-3-0191	Narrabri Logistics Hub OS-01 (NLH OS-01)	GDA	55	759093	6642055	Open site	Valid	Artefact : -		104335
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo, Doctor Alyce Cameron							
19-3-0248	Narrabri SAP AS 03	GDA	55	765175	6637453	Open site	Valid	Artefact : -	Permits	
	Contact	Recorders	ERM Australia Pty Ltd - Sydney CBD, Ms. Lorien Perchard							
19-3-0198	Narrabri Logistics Hub OS-08 (NLH OS-08)	GDA	55	759169	6641494	Open site	Valid	Artefact : -		104335
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo, Doctor Alyce Cameron							
19-3-0194	Narrabri Logistics Hub OS-04 (NLH OS-04)	GDA	55	759189	6641144	Open site	Valid	Artefact : -		104335
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo, Doctor Alyce Cameron							
19-3-0186	Namoi River IF 2	GDA	55	766653	6639625	Open site	Valid	Artefact : 1	Permits	
	Contact	Recorders	Paul Houston, Mr. Steven Booby							
19-3-0247	Narrabri SAP AS 01	GDA	55	761179	6641812	Open site	Valid	Artefact : -	Permits	
	Contact	Recorders	ERM Australia Pty Ltd - Sydney CBD, Ms. Lorien Perchard							

Report generated by AHIMS Web Service on 05/05/2023 for Imogen Crome for the following area at Datum :GDA, Zone : 55, Eastings : 755397.361 - 775395.719, Northings : 6629555.587 - 6649440.959 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 78

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

Page 1 of 7



AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Narrabri fire

Client Service ID : 779328

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
19-3-0178	NRST8	GDA	55	764297	6641643	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Jacobs Group (Australia) Pty Ltd - Newcastle, Mr. Andy Roberts							
19-3-0222	C2N ST-05	GDA	55	759811	6633241	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo, Mr. Brendan Fisher							
19-3-0201	Narrabri Logistics Hub OS-11 (NLH OS-11)	GDA	55	759093	6642407	Open site	Valid	Artefact : -		104335
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo, Doctor Alyce Cameron							
19-3-0200	Narrabri Logistics Hub OS-10 (NLH OS-10)	GDA	55	759089	6641732	Open site	Valid	Artefact : - Potential Archaeological Deposit (PAD) : -		104335
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo, Doctor Alyce Cameron							
19-3-0192	Narrabri Logistics Hub OS-02 (NLH OS-02)	GDA	55	759013	6641963	Open site	Valid	Artefact : - Potential Archaeological Deposit (PAD) : -		104335
	Contact	Recorders	OzArk Environmental and Heritage Management - Dubbo, Doctor Alyce Cameron							
19-3-0245	Narrabri SAP IF 01	GDA	55	759059	6641752	Open site	Valid	Artefact : -		
	Contact	Recorders	ERM Australia Pty Ltd - Sydney CBD, Ms. Lorien Perchard							
19-3-0249	Narrabri SAP PAD 02	GDA	55	765531	6637903	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	ERM Australia Pty Ltd - Sydney CBD, Ms. Lorien Perchard							
19-3-0184	Namoi River Scar tree	GDA	55	766474	6639342	Open site	Valid	Modified Tree (Carved or Scarred) : 1		
	Contact	Recorders	Paul Houston, Mr. Steven Booby							
19-3-0185	Namoi River IF	GDA	55	766653	6639633	Open site	Valid	Artefact : 1		
	Contact	Recorders	Paul Houston, Mr. Steven Booby							
19-3-0015	WN21 Narrabri;	AGD	55	761110	6644904	Open site	Valid	Artefact : -	Open Camp Site	84
	Contact	Recorders	Rex Silcox							
19-3-0074	ST-TRINDALL'S TSR	AGD	55	763440	6646750	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders	Mr. B Trindall							
19-3-0019	WN25 Narrabri;	AGD	55	764274	6644978	Open site	Valid	Artefact : -	Open Camp Site	84
	Contact	Recorders	Rex Silcox							
19-3-0171	NRST1	GDA	55	764392	6641819	Open site	Valid	Modified Tree (Carved or Scarred) : -		

Report generated by AHIMS Web Service on 05/05/2023 for Imogen Crome for the following area at Datum : GDA, Zone : 55, Eastings : 755397.361 - 775395.719, Northings : 6629555.587 - 6649440.959 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 78

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

Page 2 of 7



AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Narrabri fire
Client Service ID : 779328

SiteID	SiteName	Datum	Zone	Easting	Northing	Contact	Site Status **	SiteFeatures	SiteTypes	Reports
19-3-0174	NRST4	Recorders	GDA	55 764439	6641854	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts	Valid	Modified Tree (Carved or Scarred) : -	Permits	
19-3-0133	Collins Park site 2 artefacts	Recorders	GDA	55 767429	6641486	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts	Valid	Artefact : 5, Modified Tree (Carved or Scarred) : 1	Permits	
19-3-0242	CMT02	Recorders	GDA	55 756450	6642109	Mr.Allison Stewart	Valid	Modified Tree (Carved or Scarred) : -	Permits	
19-3-0206	Narrabri Logistics Hub IF-05 (NLH IF-05)	Recorders	GDA	55 759100	6641921	Environmental Resources Management - Melbourne,Miss.Meghyn Mathison	Valid	Artefact : -	Permits	104335
19-3-0241	CMT01 duplicate of 19-3-0241	Recorders	GDA	55 756229	6642367	OzArk Environmental and Heritage Management - Dubbo,Doctor.Alyce Cameron	Deleted	Modified Tree (Carved or Scarred) : -	Permits	
19-3-0240	Narrabri SAP CMT 01	Recorders	GDA	55 756229	6642355	Environmental Resources Management - Melbourne,Miss.Meghyn Mathison	Valid	Modified Tree (Carved or Scarred) : -	Permits	
19-3-0197	Narrabri Logistics Hub OS-07 (NLH OS-07)	Recorders	GDA	55 759227	6641550	ERM Australia Pty Ltd - Sydney CBD,Ms.Lorien Perchard	Valid	Artefact : -	Permits	104335
19-3-0163	Silverleaf IP-1	Recorders	GDA	55 766916	6647274	OzArk Environmental and Heritage Management - Dubbo,Doctor.Alyce Cameron	Valid	Artefact : -	Permits	104286
19-3-0123	MOLLEE TSR ST 2	Recorders	AGD	55 760775	6649084	OzArk Environmental and Heritage Management - Dubbo,Doctor.Alyce Cameron	Valid	Modified Tree (Carved or Scarred) : -	Permits	
19-3-0161	Wee Waa TSR scarred tree	Recorders	AGD	55 761143	6648228	Mr.Patrick Gaynor	Valid	Modified Tree (Carved or Scarred) : -	Permits	
19-3-0003	Dangar Village, Old Mission Cemetery	Recorders	AGD	55 763021	6642000	Phil Purcell	Valid	Burial : -, Aboriginal Ceremony and Dreaming : -	Permits	
		Recorders				Ray Kelly,Mr.Terry Donovan,Bill Trindal			Permits	

Report generated by AHIMS Web Service on 05/05/2023 for Imogen Crome for the following area at Datum :GDA, Zone : 55, Eastings : 755397.361 - 775395.719, Northings : 6629555.587 - 6649440.959 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 78
This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

Page 3 of 7



AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Narrabri fire
Client Service ID : 779328

SiteID	SiteName	Datum	Zone	Easting	Northing	Contact	Site Status **	SiteFeatures	SiteTypes	Reports
19-3-0160	scarred tree TSR Wee Waa Rd	Recorders	AGD	55 763165	6646059	Phil Purcell	Valid	Modified Tree (Carved or Scarred) : -	Permits	
19-3-0162	artefact scatter Wee Waa rd TSR	Recorders	AGD	55 763801	6646159	Phil Purcell	Valid	Artefact : -	Permits	
19-3-0173	NRST3	Recorders	GDA	55 764500	6641803	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts	Valid	Modified Tree (Carved or Scarred) : -	Permits	
19-3-0014	WN22 Narrabri;	Recorders	AGD	55 761293	6644898	Rex Silcox	Valid	Artefact : -	Open Camp Site	84
19-3-0189	Narrabri Logistics Hub IF-06 (NLH IF-06)	Recorders	GDA	55 759338	6642049	OzArk Environmental and Heritage Management - Dubbo,Doctor.Alyce Cameron	Valid	Artefact : -	Permits	104335
19-3-0167	Bobena Creek ST1	Recorders	GDA	55 759446	6632981	OzArk Environmental and Heritage Management - Dubbo,Doctor.Alyce Cameron	Valid	Modified Tree (Carved or Scarred) : -	Permits	
19-3-0164	Silverleaf IF-2	Recorders	GDA	55 767094	6647233	Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts	Valid	Artefact : -	Permits	104286
19-3-0187	Namoi River Artefact with Pattern	Recorders	GDA	55 766975	6639584	OzArk Environmental and Heritage Management - Dubbo,Doctor.Alyce Cameron	Valid	Artefact : 1	Permits	
19-3-0001	Turalin,Narrabri;	Recorders	AGD	55 762110	6642123	Paul Houston,Mr.Steven Booby	Valid	Artefact : -	Open Camp Site	
19-3-0219	C2N ST-02	Recorders	GDA	55 762839	6637517	J Auld	Valid	Modified Tree (Carved or Scarred) : -	Permits	
19-3-0012	WN24 Narrabri;	Recorders	AGD	55 764133	6644901	OzArk Environmental and Heritage Management - Dubbo,Mr.Brendan Fisher	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	84
19-3-0013	WN23 Narrabri;	Recorders	AGD	55 764133	6644901	Rex Silcox	Valid	Modified Tree (Carved or Scarred) : -	Scarred Tree	84
19-3-0175	NRST5	Recorders	GDA	55 764366	6641898	Rex Silcox	Valid	Modified Tree (Carved or Scarred) : -	Permits	
		Recorders				Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts			Permits	

Report generated by AHIMS Web Service on 05/05/2023 for Imogen Crome for the following area at Datum :GDA, Zone : 55, Eastings : 755397.361 - 775395.719, Northings : 6629555.587 - 6649440.959 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 78
This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

Page 4 of 7



AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Narrabri fire
Client Service ID : 779320

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
19-3-0193	Narrabri Logistics Hub 05-03 (NLH 05-03)	GDA	55	759083	6641906	Open site	Valid	Artefact : -		104335
	Contact	Recorders				OzArk Environmental and Heritage Management - Dubbo,Doctor.Alyce Cameron		Permits		
19-3-0250	Narrabri SAP AS 02	GDA	55	758975	6642517	Open site	Valid	Artefact : -		
	Contact	Recorders				ERM Australia Pty Ltd- Sydney CBD,Ms.Lorien Perchard		Permits		
19-3-0220	C2N ST-03	GDA	55	762372	6636961	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders				OzArk Environmental and Heritage Management - Dubbo,Mr.Brendan Fisher		Permits		
19-3-0011	Narrabri Creek;	AGD	55	763121	6644833	Open site	Valid	Artefact : -	Open Camp Site	
	Contact	Recorders				J Auld		Permits		
19-3-0172	NRST2	GDA	55	764440	6641785	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders				Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts		Permits		
19-3-0176	NRST6	GDA	55	764464	6641742	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders				Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts		Permits		
19-3-0221	C2N ST-04	GDA	55	761058	6635533	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders				OzArk Environmental and Heritage Management - Dubbo,Mr.Brendan Fisher		Permits		
19-3-0002	Dangar Village Narrabri	AGD	55	763359	6640819	Open site	Valid	Burial : -	Burial/s	
	Contact	Recorders				Harry Creamer		Permits		
19-3-0122	MOLLEE TSE ST 1	GDA	55	759691	6649421	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders				Mr.Patrick Gaynor		Permits		
19-3-0205	Narrabri Logistics Hub IF-04 (NLH IF-04)	GDA	55	759075	6642348	Open site	Valid	Artefact : -		104335
	Contact	Recorders				OzArk Environmental and Heritage Management - Dubbo,Doctor.Alyce Cameron		Permits		
19-3-0075	Narrabri Reserve	AGD	55	762000	6647800	Open site	Valid	Habitation Structure : 1		
	Contact	Recorders				Unknown Author		Permits		
19-3-0170	NM AS1	GDA	55	763091	6642134	Open site	Valid	Artefact : -		
	Contact	Recorders				Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts		Permits		
19-3-0166	Bohena Creek IF2	GDA	55	759311	6633054	Open site	Valid	Artefact : -		
	Contact	Recorders				Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts		Permits		
19-3-0195	Narrabri Logistics Hub 05-05 (NLH 05-05)	GDA	55	759186	6641402	Open site	Valid	Artefact : -		104335
	Contact	Recorders				OzArk Environmental and Heritage Management - Dubbo,Doctor.Alyce Cameron		Permits		

Report generated by AHIMS Web Service on 05/05/2023 for Imogen Crome for the following area at Datum :GDA, Zone : 55, Eastings : 755397.361 - 775395.719, Northings : 6629555.587 - 6649440.959 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 78

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

Page 5 of 7



AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Narrabri fire
Client Service ID : 779328

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
19-3-0204	Narrabri Logistics Hub IF-03 (NLH IF-03)	GDA	55	759256	6640750	Open site	Valid	Artefact : -		104335
	Contact	Recorders				OzArk Environmental and Heritage Management - Dubbo,Doctor.Alyce Cameron		Permits		
19-3-0196	Narrabri Logistics Hub 05-06 (NLH 05-06)	GDA	55	759292	6641459	Open site	Valid	Artefact : -		104335
	Contact	Recorders				OzArk Environmental and Heritage Management - Dubbo,Doctor.Alyce Cameron		Permits		
19-3-0076	Tree with two scars near Mollie Weir	AGD	55	759714	6649251	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders				Mr.Simon Smith		Permits		
19-3-0169	Bohena Creek PAD1	GDA	55	759450	6633363	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders				Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts		Permits		
19-3-0160	Bohena Creek PAD2	GDA	55	759539	6633739	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders				Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts		Permits		
19-3-0005	Bohena Creek,Brigalow Creek;	AGD	55	760379	6644930	Open site	Valid	Ceremonial Ring (Stone or Earth) : -, Modified Tree (Carved or Scarred) : -	Bora/Ceremonial,C arved Tree	65
	Contact	Recorders				Isabel McBryde		Permits		
19-3-0216	Namoi River PAD 1	GDA	55	763562	6641610	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders				Jacobs Group (Australia) Pty Ltd - Newcastle,Ms.Alison Lamond		Permits		
19-3-0179	NRST7	GDA	55	764271	6641773	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders				Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts		Permits		
19-3-0177	NRST9	GDA	55	764464	6641958	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	Recorders				Jacobs Group (Australia) Pty Ltd - Newcastle,Mr.Andy Roberts		Permits		
19-3-0190	Narrabri Logistics Hub IF-07 (NLH IF-07)	GDA	55	759615	6642003	Open site	Valid	Artefact : -		104335
	Contact	Recorders				OzArk Environmental and Heritage Management - Dubbo,Doctor.Alyce Cameron		Permits		
19-3-0210	NNS IA14	GDA	55	769935	6640836	Open site	Destroyed	Artefact : -		
	Contact	Recorders				Niche Environment and Heritage,Niche Environment and Heritage,Ms.Chelsea Fri		Permits		

Report generated by AHIMS Web Service on 05/05/2023 for Imogen Crome for the following area at Datum :GDA, Zone : 55, Eastings : 755397.361 - 775395.719, Northings : 6629555.587 - 6649440.959 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 78

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

Page 6 of 7

Your Ref/PO Number : Narrabri fire
Client Service ID : 779328

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
--------	----------	-------	------	---------	----------	---------	----------------	--------------	-----------	---------

Site Status

Valid - The site has been recorded and accepted onto the system as valid

Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.

Partially Destroyed. The site has been completely impacted or has been severely impacted as a consequence of permit activity but sometimes also after natural events. There is no longer any of the site left or the ground was progressively eroded without leaving any trace. The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground.

Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified.

Report generated by AHIMS Web Service on 05/05/2023 for Imogen Crome for the following area at Datum :GDA, Zone : 55, Eastings : 755397.361 - 775395.719, Northings : 6629555.587 - 6649440.959 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 28

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission

Page 7 of 7

APPENDIX 2: ABORIGINAL HERITAGE: UNANTICIPATED FINDS PROTOCOL

An Aboriginal artefact is anything which is the result of past Aboriginal activity. This includes stone (artefacts, rock engravings etc.), plant (culturally scarred trees) and animal (if showing signs of modification; i.e. smoothing, use). Human bone (skeletal) remains may also be uncovered while onsite.

Cultural heritage significance is assessed by the Aboriginal community and is typically based on traditional and contemporary lore, spiritual values, and oral history, and may also consider scientific and educational value.

Protocol to be followed if previously unrecorded or unanticipated Aboriginal object(s) are encountered:

1. If any Aboriginal object is discovered and/or harmed in, or under the land, while undertaking the proposed development activities, the proponent must:
 - a. Not further harm the object
 - b. Immediately cease all work at the particular location
 - c. Secure the area to avoid further harm to the Aboriginal object
 - d. Notify Heritage NSW as soon as practical on (02) 9873 8500 (heritagemailbox@environment.nsw.gov.au), providing any details of the Aboriginal object and its location; and
 - e. Not recommence any work at the particular location unless authorised in writing by Heritage NSW.
2. If Aboriginal burials are unexpectedly encountered during the activity, work must stop immediately, the area secured to prevent unauthorised access and NSW Police and Heritage NSW contacted.
3. Cooperate with the appropriate authorities and relevant Aboriginal community representatives to facilitate:
 - a. The recording and assessment of the find(s)
 - b. The fulfilment of any legal constraints arising from the find(s), including complying with Heritage NSW directions
 - c. The development and implementation of appropriate management strategies, including consultation with stakeholders and the assessment of the significance of the find(s).
4. Where the find(s) are determined to be Aboriginal object(s), recommencement of work in the area of the find(s) can only occur in accordance with any consequential legal requirements and after gaining written approval from Heritage NSW (normally an Aboriginal Heritage Impact Permit).

APPENDIX 3: ABORIGINAL HERITAGE: ARTEFACT IDENTIFICATION

	
A retouched silcrete flake	A quartz flake
	
Microliths (scale = 1 cm)	Volcanic flakes
	
Flake characteristics (scale = 1 cm)	A mudstone/tuff core from which flakes have been removed