

Aboriginal Cultural Heritage Due Diligence Assessment

Narrabri North Solar Farm

at

742 Stoney Creek Road, Narrabri, NSW

Prepared for

YES Group Pty Ltd

Version 1

22/1/26

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Glossary and Acronyms

ACRONYM	DESCRIPTION
ACHDDA	Aboriginal Cultural Heritage Due Diligence Assessment
ACHMP	Aboriginal Cultural Heritage Management Plan
ACHCRP	Aboriginal Cultural Heritage Consultation Requirements for Proponents
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
BESS	Battery Energy Storage System
DCCEEW	NSW Department of Climate Change, Energy, the Environment and Water
DPHI	NSW Department of Planning, Housing and Infrastructure
EIS	Environmental Impact Statement
EP&A Act	<i>Environmental Planning and Assessment Act 1979 (NSW)</i>
GSV	Ground Surface Visibility
Heritage Act	<i>Heritage Act 1977 (NSW)</i>
IBRA	Interim Biogeographic Regionalisation for Australia
LALC	Local Aboriginal Land Council
LGA	Local Government Area
MW	Megawatt
MWh	Megawatt hours
NPW Act	<i>National Parks and Wildlife Act 1974 (NSW)</i>
PAD	Potential Archaeological Deposit
RAP	Registered Aboriginal Party
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
SHI	State Heritage Inventory
SHR	State Heritage Register
SSD	State Significant Development

EXECUTIVE SUMMARY

Y.E.S. Group Pty Ltd (YES) is proposing the development of a 4.95-megawatt (MW) solar farm (single-axis tracker photovoltaic solar array) accompanied by an 11-megawatt hours (MWh) battery storage energy system (BESS) and related infrastructure near Narrabri in New South Wales, known as the 'Narrabri North Solar Farm' (the project/development). Red-Gum Environmental Consulting Pty Ltd (Red-Gum) was engaged by YES (the proponent) to undertake an Aboriginal Cultural Heritage Due Diligence Assessment (ACHDDA) for the proposed development.

This ACHDDA provides a preliminary assessment designed to inform the next steps required for the proposal. If the development is classified as a State Significant Development (SSD), an Aboriginal Cultural Heritage Assessment Report (ACHAR) with consultation would likely be required. For SSD, Section 90 of the NPW Act is turned off during the assessment of State Significant projects. Instead, department Secretary's Environmental Assessment Requirements (SEARs) are issued. SSD are major projects that require approval from the Minister for Planning.

The Narrabri North Solar Farm is located at 742 Stoney Creek Road, Narrabri (approximately 9 kilometres east of Narrabri). The development site spans approximately 10.5 hectares within Lot 3/DP1034554. The land is zoned RU1 – Primary Production, within the Narrabri Shire Council. The development includes associated infrastructure such as access/internal roads, security boundary fencing, electrical equipment, site parking, site amenities, and the installation of an 22kV overhead transmission line connection and two new poles (to connect to an existing 22kV line located approximately 300 metres north – refer to indicative site layout in **Map 2**). For this assessment, Red-Gum has considered that all impacts associated with the proposal are within the development site boundary shown in **Map 1**. The development is confined to the existing road alignment (with no widening) and the proposed development footprint shown in **Map 1**.

The site's development footprint is already cleared of remnant vegetation, with only a few scattered trees remaining. The subject land, encompassing the broader cadastral lot, is characterised by generally flat terrain that declines northward from around 270 to 250 metres above sea level on land that has been historically cleared of native vegetation and primarily managed for agriculture. There is native vegetation present on site in the form of derived low-conservation value native groundcover (i.e. native grasses) ranging from 0% to 45% (averaging 20% across the site) that has very low species diversity with at least 50% cover of exotic grasses/forbs and six scattered native trees. Specifically, there are two medium sized Poplar Box (*Eucalyptus populnea*) and four small to medium sized White Cypress Pine (*Callitris glaucophylla*). The low-value native groundcover cover is characteristic of semi-arid land that has previously subjected to agricultural clearing, cultivation, mechanical disturbance, significant land-forming, and livestock grazing.

No (zero) Aboriginal Cultural Heritage sites have been previously recorded within the site. A survey of the site was undertaken on 11th of August 2025 by Damian Wall of Red-Gum. During the site survey, areas of previous disturbance were noted and recorded. Areas of ground surface exposure were targeted in order to identify any Aboriginal objects within the site. No previously unrecorded sites or objects were located during the survey. The project area does not contain any permanent waterbodies or landforms that have high archaeological probability.

The assessment considered the perceived impacts associated with the proposal and did not identify any areas of *high archaeological potential* that are likely to be harmed within the area assessed. The *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW 2010) provides a flowchart with the steps of the due diligence process outlined. This flowchart is provided in **Appendix A** in order to demonstrate that each step of the process has been addressed.

The study area exhibited variable ground surface visibility (GSV) and limited exposure without revealing any apparent Aboriginal objects. No trees with cultural modifications were identified within the site. No Aboriginal cultural heritage objects were identified within the site. The survey did not identify any undisturbed areas of potential (PADs) within the site.

The purpose of the Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales (DECCW 2010) is to provide a defence against prosecution if the process is followed. The due diligence code sets out penalties for impacting on Aboriginal objects, defining two types of offences as follows:

- An offence of harming or desecrating an object which a person knows is an Aboriginal object (a 'knowing offence'); and
- An offence of harming an object whether or not a person knows it is an Aboriginal object (a 'strict liability offence').

The maximum penalty for the knowing offence is \$550,000 or \$275,000 (depending on whether there are aggravating circumstances) and 1 or 2 years' jail for an individual. For a corporation the maximum penalty for the knowing offence is \$1.1 million. The maximum penalty for the strict liability offence is \$110,000 or \$55,000 (depending whether there are aggravating circumstances) for an individual or \$220,000 for a corporation.

As this assessment has not identified any areas of high archaeological sensitivity or Aboriginal objects within the assessed zone, it will provide a defence against prosecution if Aboriginal sites are impacted by the development assuming its recommendations are followed. The following contingencies are to be adhered to during the project implementation stage:

Contingency 1: Discovery of unanticipated Aboriginal objects within areas of low potential.

All Aboriginal objects and places are protected under the *National Parks and Wildlife Act 1974* (NPW Act). It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by the NSW Department of Planning, Housing and Infrastructure (DPHI). Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the DPHI and Aboriginal stakeholders.

Contingency 2: Discovery of Aboriginal ancestral remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains;
2. Notify the NSW Police and EPA Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location.
3. Not recommence work at that location unless authorised in writing by DPH.

Regards



Mr Damian Wall, Managing Director
BAppSc, MEnvMgt, MAACAI, Grad Cert CHM
22/1/26

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1 Introduction

Y.E.S. Group Pty Ltd (YES) is proposing the development of a 4.95-megawatt (MW) solar farm with battery storage near Narrabri in north-western region of New South Wales known as the 'Narrabri North Solar Farm' (the project/development). Red-Gum Environmental Consulting Pty Ltd (Red-Gum) was engaged by YES (the proponent) to undertake an Aboriginal Cultural Heritage Due Diligence Assessment (ACHDDA) for the proposed development near Narrabri, New South Wales.

This ACHDDA provides a preliminary assessment designed to inform the next steps required for the proposal. If the development is classified as a State Significant Development (SSD), an Aboriginal Cultural Heritage Assessment Report (ACHAR) with consultation would likely be required. For SSD, Section 90 of the NPW Act is turned off during the assessment of State Significant projects. Instead, department Secretary's Environmental Assessment Requirements (SEARs) are issued. SSD are major projects that require approval from the Minister for Planning. The study area is within the Narrabri Local Aboriginal Land Council (Narrabri LALC) area.

The development site/footprint ("study area") is semi-arid land that has previously subjected to agricultural clearing, cultivation, mechanical disturbance, significant land-forming, and livestock grazing. This has resulted in the loss of native vegetation since European settlement.

This Due Diligence Assessment has been prepared to assess the proposed works. The advice and reporting provided here follows the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010a).

1.1 Report Contributors

Table 1: Details of staff qualifications and experience

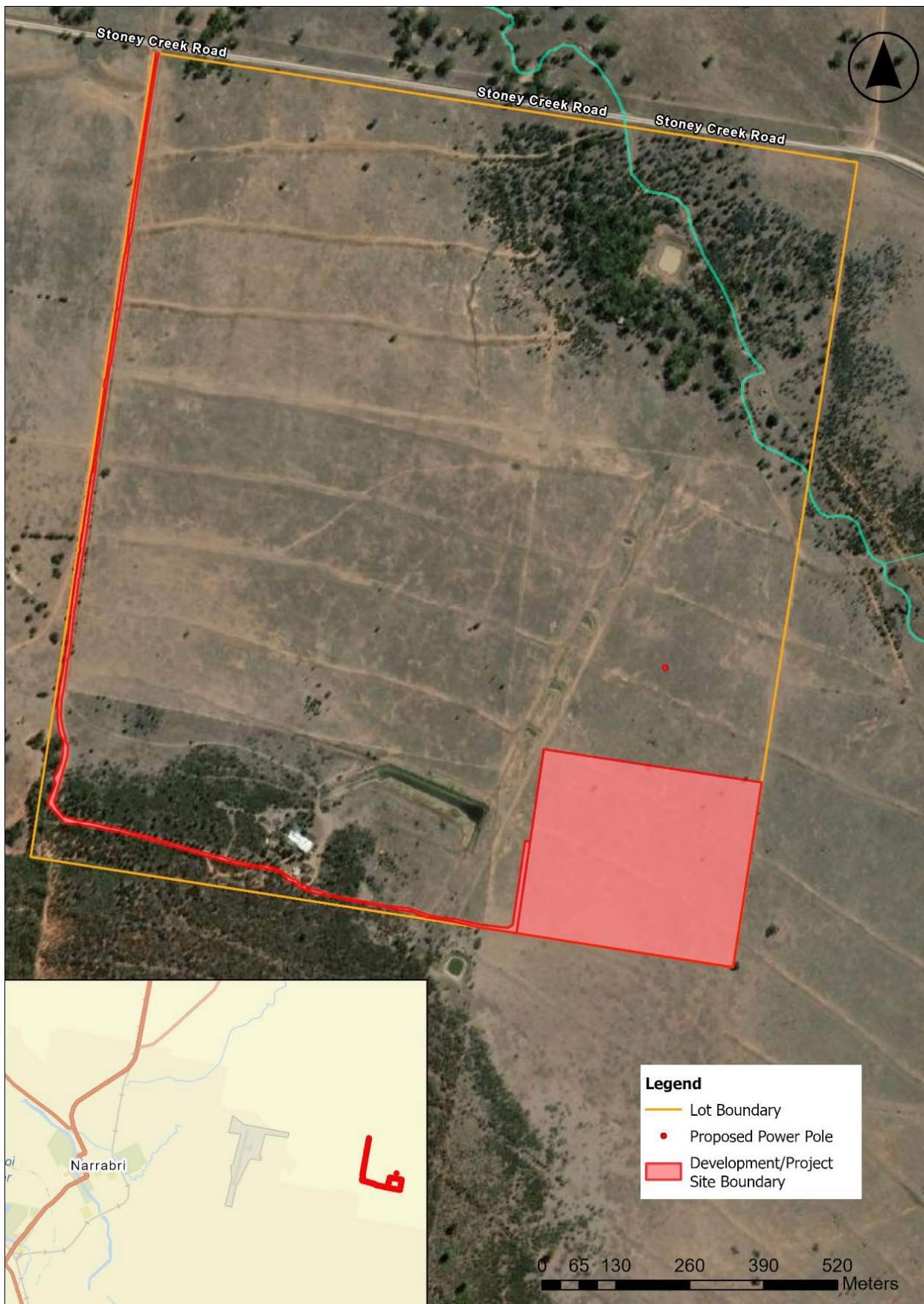
Name	Position/Role	Relevant Qualifications	Relevant Experience
Damian Wall	Report author Field supervisor	Bachelor of Applied Science (Parks, Recreation & Heritage), CSU. Master Environmental Management & Restoration, CSU. Damian holds the relevant qualifications for undertaking formal archaeological assessment in New South Wales (as set out in the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales. Full member of the Australian Association of Consulting Archaeologists Inc (AACAI). Currently completing a Masters of Archaeology & Cultural Heritage Management (Flinders University).	+25 years
Dr Jacqui Durrant	Contributing author	Bachelor of Applied Science (Cultural Resource Management) (Hons). PhD Cultural History, La Trobe (2005). Historian. Professional Historians' Association of Australia	+ 25 years
Dr Emily Mendham	Contributing author	Bachelor of Applied Science (Parks, Recreation and Heritage) (Hons). PhD Environmental Sociology and Human Geography, Charles Sturt University (2010)	+2 years

2 Background & Description of Works

The Narrabri North Solar Farm proposes the development of a 4.95-megawatt (MW) single-axis tracker photovoltaic solar array accompanied by an 11-megawatt hours (MWh) battery storage energy system (BESS) and related infrastructure that at 742 Stoney Creek Road, Narrabri (approximately 9 kilometres east of Narrabri); approximately 100 kilometres northwest of Gunnedah in north-western region of New South Wales. The development site spans approximately 10.5 hectares within Lot 3/DP1034554 which is zoned RU1 – Primary Production in the Narrabri Shire Council.

The development includes the solar array and BESS as well as associated infrastructure such as access/internal roads, security boundary fencing, electrical equipment, site parking, site amenities, and the installation of an 22kV overhead transmission line connection and two new poles (to connect to an existing 22kV line located approximately 300 metres north – refer to indicative site layout in **Map 2**). For this assessment, Red-Gum has considered that all impacts associated with the proposal are within the development site boundary shown in **Map 1**. The development is confined to the existing road alignment (with no widening) and the proposed development footprint shown in **Map 1**.

The site of the proposed solar farm and BESS is semi-arid land that has previously subjected to agricultural clearing, cultivation, mechanical disturbance, significant land-forming, and livestock grazing. The site's development footprint is already cleared of remnant vegetation, with only a few scattered trees remaining. The subject land, encompassing the broader cadastral lot, is characterised by generally flat terrain that declines northward from around 270 to 250 metres above sea level on land. Low-value, low diversity derived native ground cover is present on site, ranging from 0% to 45% (averaging 20% across the site), with at least 50% cover of exotic grasses/forbs and six scattered native trees. The proposed development does not require the removal of any mature trees.



Map 1: Indicative development site location showing nearby hydrological features.



Map 2: Client supplied indicative proposed solar farm development site layout

3 Legislative Context

The purpose of this assessment is to provide a preliminary assessment designed to inform the next steps required for the proposal. If the development is classified as a SSD, an ACHAR with consultation would likely be required. For SSD, Section 90 of the NPW Act is turned off during the assessment of SSD. Instead, department SEARs are issued.

The Burra Charter (International Council On Monuments and Sites) outlines a set of principles and practices for the management of cultural heritage in Australia. It provides a nationally recognised best practice standard for the management of cultural heritage places.

3.1 Environment Planning and Assessment Act (1979) (EP&A Act) (NSW)

The EP&A Act establishes requirements related to land use and planning and provides the legislative basis for planning and environmental assessment in NSW. It protects Aboriginal heritage by requiring the consideration of potential impacts on Aboriginal objects and places in the planning and development approvals process.

If the proposal is not determined to be a SSD, the development would be assessed under Part 4 of the EP&A Act via a Development Application and Council would be the consent authority. An Aboriginal Due Diligence Assessment would be the first step and provide preliminary information to inform the next stages of the assessment and approval process.

A development is considered significant to the State if it is over a specific size, is in an environmentally sensitive area, or will exceed capital investment value. SSD are major projects which require approval from the Minister for Planning or the Independent Planning Commission due to their economic, environmental or social impact. *Part 4*, Division 4.7 applies to development that is declared to be SSD by a State Environmental Planning Policy (SEPP). Pursuant to Part 4.41 (d) of the EP&A Act, if approved, an Aboriginal Heritage Impact Permit (AHIP) under Section 90 of the NPW Act is not required for SSD. Instead, all management related to Aboriginal cultural heritage within the study area would be governed by the policies within an approved Aboriginal Cultural Heritage Management Plan (ACHMP).

3.2 National Parks and Wildlife Act (1974) (NPW Act) (NSW)

The NPW Act regulates the control and management of all national parks, historic sites, nature reserves, and Aboriginal areas (among others) in NSW, and provides statutory protection to all Aboriginal sites within NSW. The main aim of the NPW Act is to conserve the natural and cultural heritage of NSW. The NPW Act defines an Aboriginal 'object' and an Aboriginal 'place' as:

Aboriginal object: any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains.

Aboriginal place: any place declared to be an Aboriginal place under section 84 by the Minister.

Part 6 of the NPW Act provides specific protection for Aboriginal objects and declared places. Under Part 6, it is an offence to harm an Aboriginal object or harm or desecrate an Aboriginal place without appropriate consent, or defence, or where an exemption applies (e.g., emergency fire fighting). Where works will disturb Aboriginal objects, an Aboriginal Heritage Impact Permit (AHIP) would normally be required, unless the

development is an SSD, where permits under Section 90 NPW Act are not required. Section 90 of the NPW Act is turned off during the assessment of SSD projects. Instead, SEARs are issued.

Under the NPW Act, harm is defined as:

harm an object or place includes any act or omission that—

- (a) destroys, defaces or damages the object or place, or
- (b) in relation to an object—moves the object from the land on which it had been situated, or
- (c) is specified by the regulations, or
- (d) causes or permits the object or place to be harmed in a manner referred to in paragraph (a), (b) or (c),

but does not include any act or omission that—

- (e) desecrates the object or place, or
- (f) is trivial or negligible, or
- (g) is excluded from this definition by the regulations.

Under Section 89A of the Act, it is a requirement to notify the Secretary of the NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW) of the location of an Aboriginal object. Identified Aboriginal items and sites are registered on Aboriginal Heritage Information Management System (AHIMS) that is administered by Heritage NSW. All Aboriginal objects and declared Aboriginal places (by the Minister) are protected under the NPW Act.

There are no gazetted Aboriginal places in the study area.

3.3 Heritage Act (1977) (Heritage Act) (NSW)

The Heritage Act protects the cultural and natural history of NSW with emphasis on historic (non-Aboriginal) heritage items, including places, buildings, works, relics, moveable objects, precincts, historic shipwrecks and archaeological sites of State or local significance. It contains mechanisms to protect and conserve NSW's heritage and provides for the identification and registration of heritage items of state significance. The Heritage Act establishes the State Heritage Register (SHR), which can protect Aboriginal cultural heritage items and places. Once an item of significance is listed on the SHR, major changes to it usually require the approval of the Heritage Council.

If the development is assessed as SSD it would not be subject to approvals under the Heritage Act.

A search of the State Heritage Inventory on 9th January 2026 showed there are no sites in the vicinity of the proposal area (NSW Government 2024).

3.4 State Environmental Planning Policy (Planning and Systems) 2021 (NSW)

The State Environmental Planning Policy (Planning Systems) 2021 (Planning SEPP) identifies developments declared to be state significant.

3.5 State Environmental Planning Policy (Transport and Infrastructure) 2021 (NSW)

Solar farms (as electricity generating works) are **permitted with consent on prescribed non-residential land (RU1 Primary Production)** even when the LEP doesn't expressly list them.

3.6 Native Title Act (1993) (NT Act) (Commonwealth)

The NT Act provides a framework for the determination of native title claims within Australia, and for negotiations and decision making regarding the use and management of native title lands and waters.

The proposal is within a registered Native Title claim area, the NSD37/2019 Gomeroi People (NC2011/006) native title area. In accordance with best practice and to adequately discharge due diligence, the Proponent may wish to liaise with the relevant Native Title holders to inform them of the project prior to works commencing. If the consultation identifies any non-tangible cultural values and knowledge not evident in the desktop or field inspection, a formal Aboriginal Cultural Heritage Assessment may be warranted.

3.7 Aboriginal Land Right Act (1983) (ALR Act) (Commonwealth)

The ALR Act established Aboriginal Land Councils (at a State and Local Level). In relation to Aboriginal culture and heritage, these bodies have a statutory obligation under Section 52 of the ALR Act to:

- a) take action to protect the culture and heritage of Aboriginal persons in the council's area, subject to any other law, and
- b) promote awareness in the community of the culture and heritage of Aboriginal persons in the council's area.

The Project Area is within the boundary of the Narrabri Local Aboriginal Land Council (Narrabri LALC).

3.8 Environment Protection and Biodiversity Conservation Act (1999) (EPBC Act) (Commonwealth)

The EPBC Act is designed as a means of protecting a defined set of 'protected matters', including cultural heritage where it is of national significance, through assessment and approvals processes. The EPBC Act focuses Australian Government interests on the protection of matters of national environmental significance. The EPBC Act establishes both a National Heritage List and Commonwealth Heritage List of protected places.

There are no Aboriginal heritage items listed on the National Heritage List or Commonwealth Heritage List relevant to the proposal area.

3.9 Aboriginal and Torres Strait Islander Heritage Protection Act (1984) (ATIHIP Act) (Commonwealth)

The ATSIHP Act's purpose is the protection from injury and desecration of places and objects that are of significance to Aboriginal Australians. It assists in the protection of places, areas and objects that 'are of particular significance to Aboriginals in accordance with Aboriginal tradition'. The ATSIHP Act is designed to deal with Aboriginal cultural property (intangible heritage), which are not currently protected under the NPW Act. This legislation has usually been invoked in emergency and conflicted situations and takes precedence over state heritage legislation.

While no formal database of Section 10 applications or declarations is publicly available, this information is registered in gazettal notices within the Federal Register of Legislation. A search of this register did not identify any Section 10 applications or declarations relevant to the Project Area.

3.10 Narrabri Local Environment Plan (2012)

There are currently no Aboriginal places of heritage significance listed in the Narrabri LEP near the proposal area.

4 Scope of the Assessment

The following is a summary of the major objectives of this assessment:

1. Conduct background research in order to recognise any identifiable trends in site distribution and location, including a search of the AHIMS.
2. Undertake archaeological survey as per requirement 5 of the code, with particular focus on landforms with high potential for heritage places within the study area, as identified through background research.
3. Record and assess sites identified during the survey in compliance with the guidelines endorsed by Heritage NSW.
4. Determine levels of archaeological and cultural significance of the study area.
5. Make recommendations to mitigate and manage any cultural heritage values identified within the study area.

5 The Due Diligence System

The *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* provides a step-wise process to help determine whether an activity is likely to cause 'harm' to 'Aboriginal objects' (both as defined in the NPW Act). If it is determined that the work may 'proceed with caution' and harm later occurs, the documentation of due diligence may provide a defence against prosecution. The following report address the questions set out in the generic *due diligence system* (as shown in **Figure 1**).

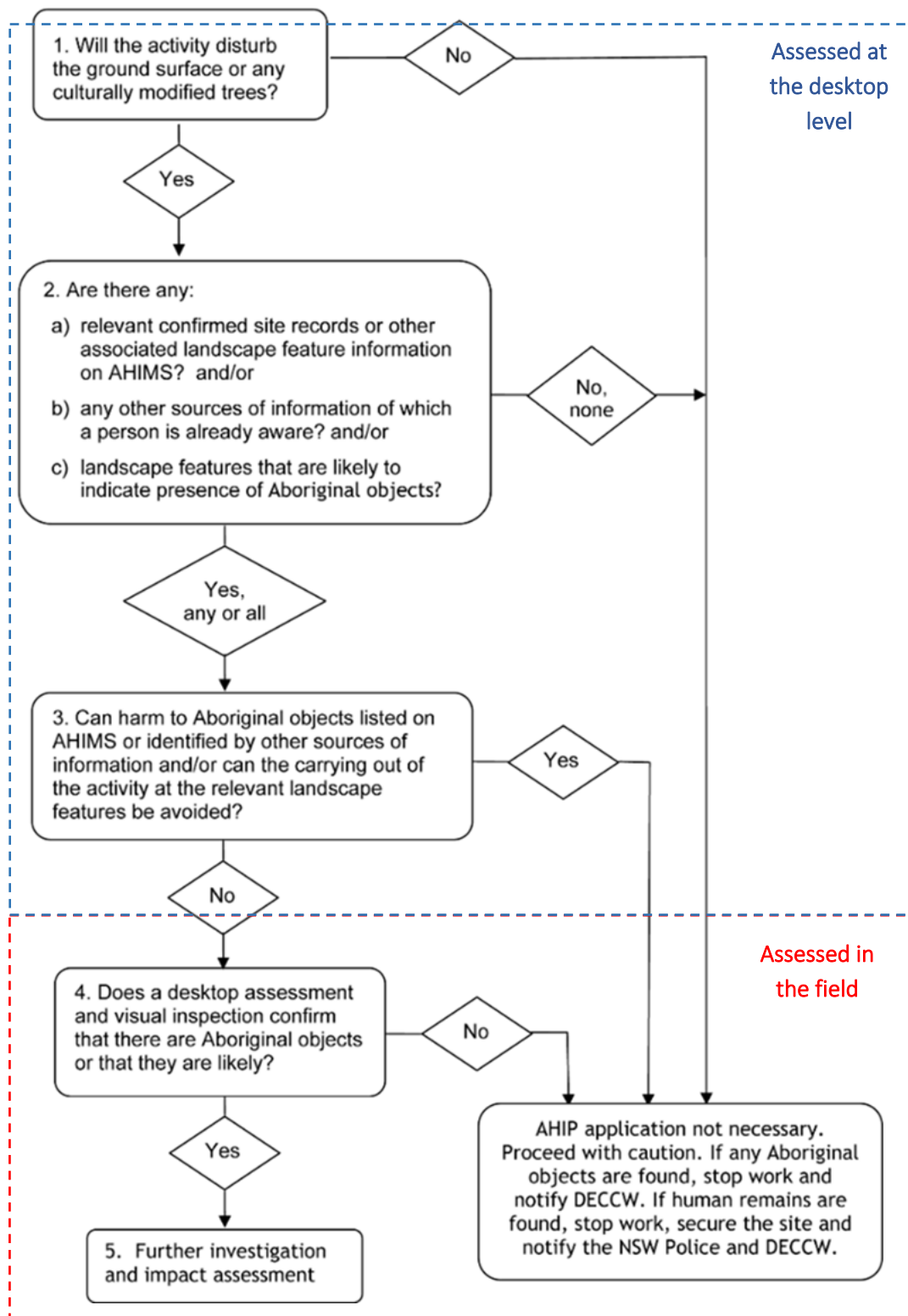


Figure 1: Generic Due Diligence process in NSW

6 Desktop Assessment

A desktop assessment has been undertaken to review existing archaeological studies for the study area and surrounding region. This information has been synthesised to develop some Aboriginal site predictive statements for the study area and identify known Aboriginal sites and/or places recorded in the study area. This desktop assessment has been prepared in accordance with requirements 1 to 4 of the code.

6.1 Soil and Geological Landscapes

6.1.1 Soils and Geology

The topography of the Narrabri LGA is characterised mostly by flat plains, with some waterways and associated terraces. The eastern half of the LGA has great variation in topography with distinct small hills and mountain ranges, while the western side is flatter.

The proposal occurs within the Brigalow Belt South Interim Biogeographic Regionalisation for Australia (IBRA) region and within both the Liverpool Plains IBRA subregion (for the proposed solar farm) and Northern Basalts IBRA subregion (for the proposed access way). The Brigalow Belt South bioregion contains a diversity of landscapes, from undulating hills with low ridges and deep valleys, as well as flat alluvial plains towards the south. The region extends from northern NSW (6.5% of the total) to rangeland QLD.

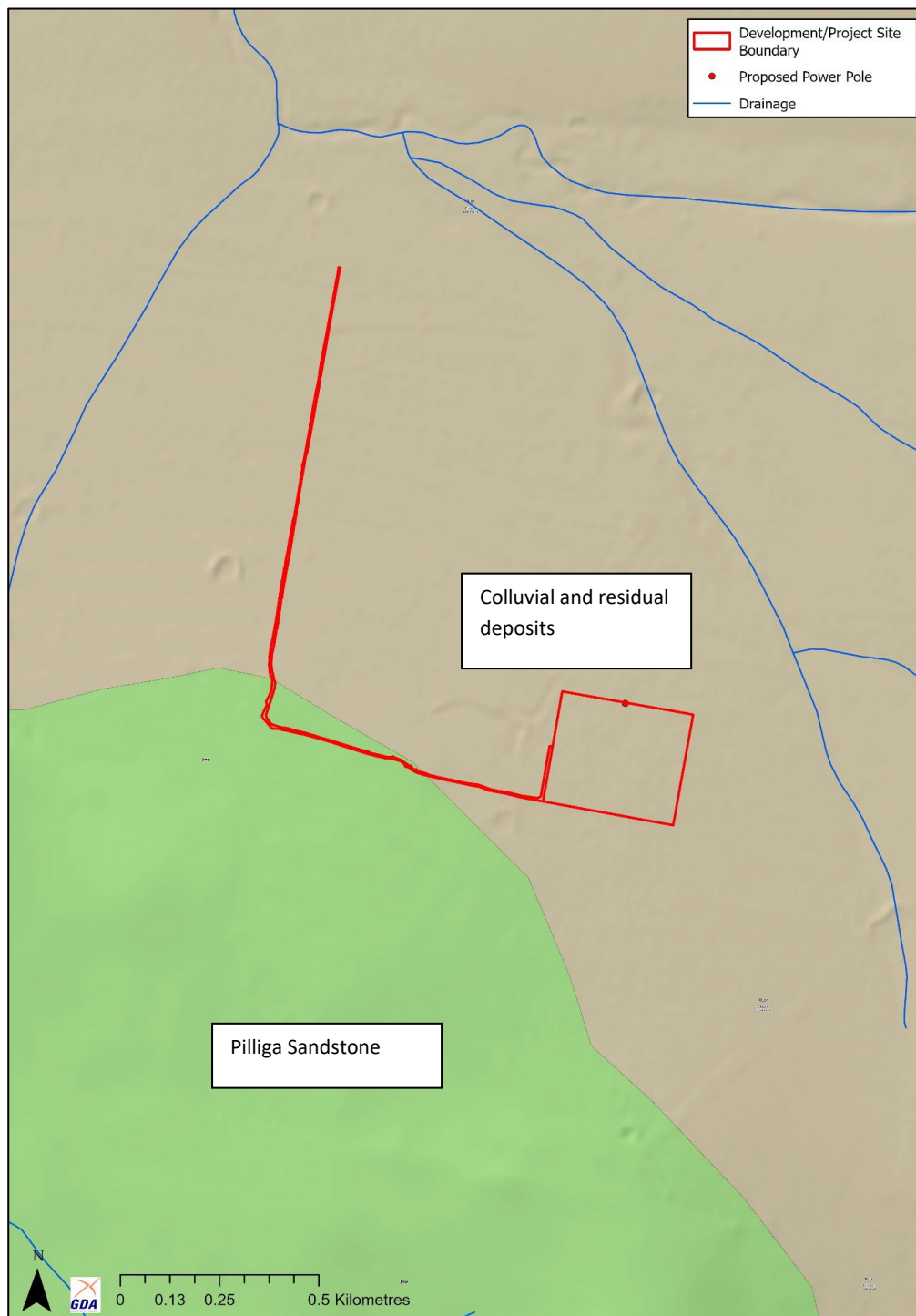
The Liverpool Plains subregion consists of Quaternary alluvial plains and outwash fans derived from Tertiary basalts. Permian and Triassic quartz sandstones occur with minor basalt caps. The subregion contains undulating hills and sloping plains with alluvial channels and floodplains. Typical soils are extensive black earths on low angle slopes, brown clays and alluvial soils. On slopes below sandstone, soils consist of red or brown texture contrast soils. Plains grass, panic, windmill grass and blue grass occur on black earths with occasional white box, yellow box, poplar box and wilga. White box and white cypress pine with rough barked apple, hill red gum, occasional belah and mulga are present on texture contrast hillslope soils.

The area has a temperate to sub-humid climate, with no pronounced dry season with rainfall spread throughout the year, although there is a slight summer rainfall peak. Mean annual rainfall ranges from 650mm to 750mm per year. Summers are hot with daytime temperatures commonly above 30 degrees Celsius. Winters are cool to mild.

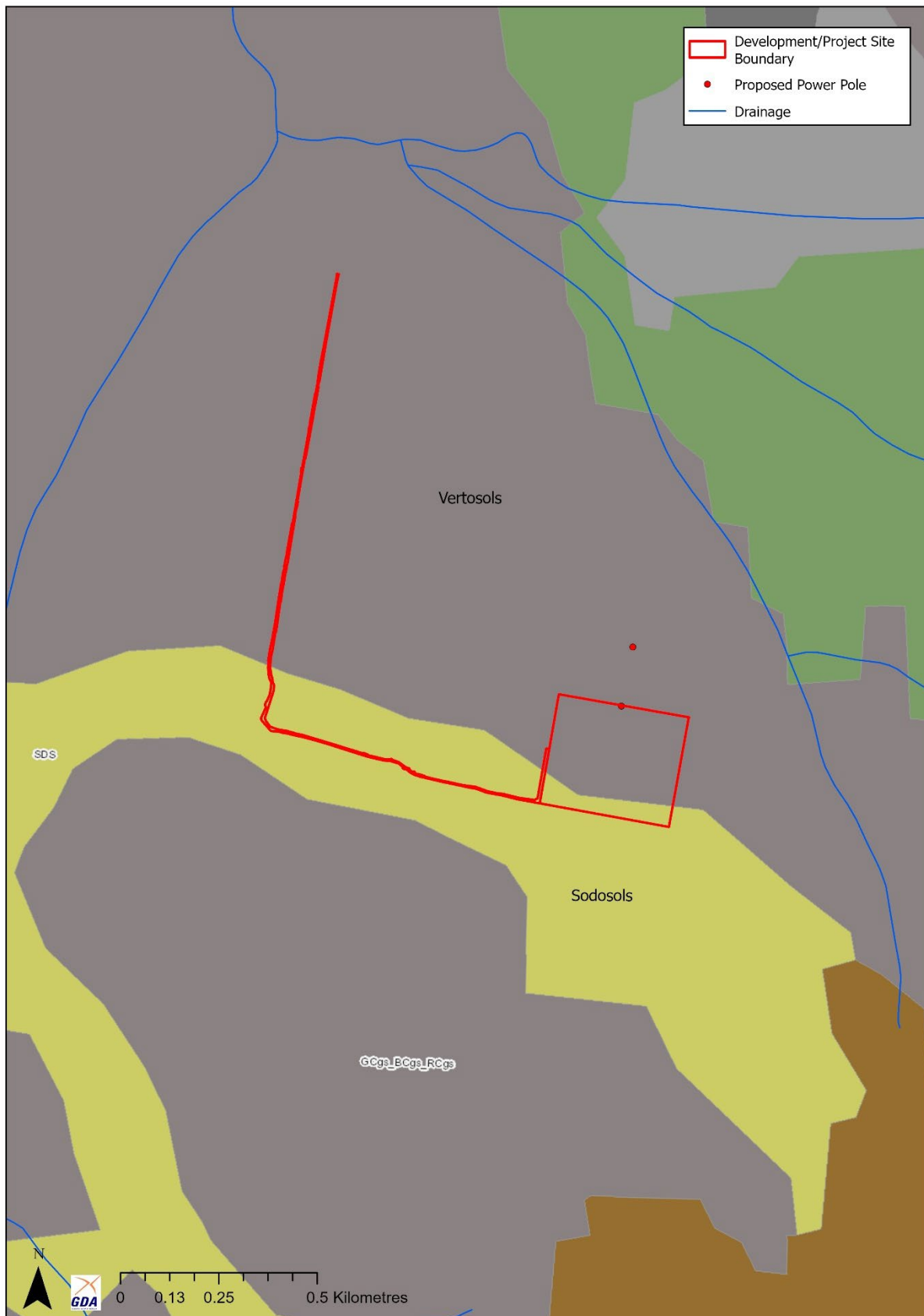
The Northern Basalts subregion consists of Tertiary basalts over Jurassic quartz sandstones and alluvial sediments derived from these. Landforms are characterised by undulating low stony hills, long slopes with sandy wash and heavy clays in the valley floors. Black loams are present on basalt ridges. On slopes, soils consist of deep sands on sandstone and texture contrast soils. Heavy grey clay occurs on alluvial flats. Brigalow, belah, whitewood, wilga, budda and poplar box occur on basalt hills while silver-leaved ironbark, spotted gum and smooth-barked apple occur on stony hills. River red gum, belah myall and poplar box are present on basalt flats. Silver-leaved ironbark and white cypress pine occur in sandstone rocks, with smooth-barked apple, white cypress, Blakely's red gum, Moreton Bay ash, poplar box, wilga, rough-barked apple, bull oak, on lower sandstone slopes. White box, with silver-leaved ironbark, white wood, bull oak and brigalow occur on alluvial clays. River red gum grown along all streams. The climate here is warm and dry. There is a slight dominance in summer rainfall. Summers are hot and winters cool.

The northern end of the accessway is about 1.5 km south east of Horsearm Creek, an important local watercourse that is a tributary feeding Narrabri Creek. These form part of the Namoi River catchment. These features would have supported a wide range of food, medicine and tool making resources in the area.

According to MinView (<https://minview.geoscience.nsw.gov.au/>) the geology of the area is characterised as Colluvial and residual deposits of quaternary age. The dog-leg of the access way traverses through Pilliga Sandstone conglomerate of the late Jurassic: medium- to very coarse-grained, well sorted, angular to subangular quartzose sandstone and conglomerate (minor interbeds of mudstone, siltstone and fine-grained sandstone and coal, common carbonaceous fragments and iron staining, rare lithic fragments) (**Map 3**). **Map 4** shows the Australian Soils Classification for the area, which is classified as vertosols (majority of the area) and sodosols (southern portion of the solar farm development area and access way).



Map 3: Geology of the proposed site. Source: NSW Government datasets.seed.nsw.gov.au. Scale: 1:11.500



Map 4: Soil types in the vicinity of the study area: Australian Soils Classification (ASC). DPIE 2021. Scale 1:11,500. Source: NSW Government datasets.seed.nsw.gov.au

6.2 Flora and Fauna

In the Narrabri region, Aboriginal people would have been able to draw upon a rich array of native plants (grasses, seeds, tubers, fruits) and animals (kangaroos, possums, fish, yabbies, birds and insects) from the Namoi River floodplains, woodlands and surrounding landscapes. Terrestrial and freshwater resources were utilised by the Kamilaroi. Stone axes and smaller flakes were used (Parker, 1909, cited in Piper et al., 2019). Parker (1909 cited in Piper et al., 2019) cited that the resources of the Pilliga forests, including wood and bark, were used extensively to make spears, clubs, shields, boomerangs and shelter. Bone was used to make needles to craft items from kangaroo and possum skin (Parker, 1909, cited in Piper et al., 2019). Traps and snares were made from bark and grass for smaller game (birds, possums, pademelons), larger species were stalked or herded, emu nests were raided, honey was sourced and some plants were eaten raw (Parker, 1909, cited in Piper et al., 2019). Parker also notes that seeds of the *Sterculia* and other similar species were ground and made into cakes (Parker, 1909, cited in Piper et al., 2019).

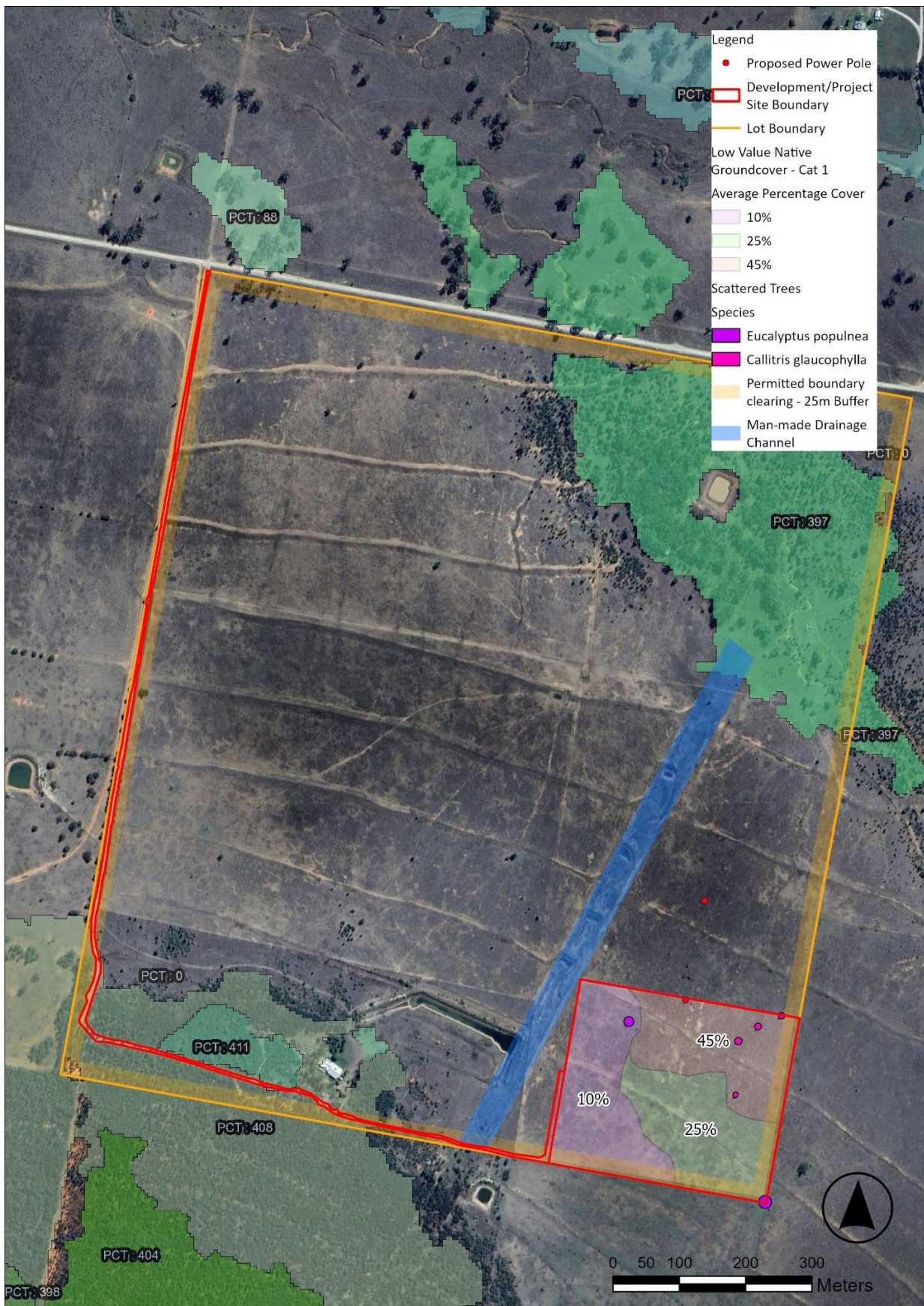
Part of the proposed access way (approximately 0.5 hectares) appears to intersect modelled NSW PCT 411 and 408 in the south western corner. However, the PCT's landscape position and remnant native species suggest it more closely aligns with PCT 397 – '*Poplar Box - White Cypress Pine shrub grass tall woodland of the Pilliga - Warialda region, Brigalow Belt South Bioregion*'. Additionally, site assessments confirmed that the proposed access way occurs on an existing gravel road that is devoid of native vegetation. This is different from the NSW modelled PCT and Land Categorisation due to the inherent limitations in the NSW model mapping resolution. No loss of native vegetation will occur in this area, provided the development remains within the existing road alignment without widening. Historical aerial imagery from 1983 shows evidence of native vegetation clearing and ongoing maintenance of the existing road (demonstrating that the area has been cleared for some time and qualifies as Category 1 – Exempt Land).

Although NSW native vegetation modelling has classified the site remainders of the subject land as 'PCT 0 – Not native' and Category 1 - Exempt Land, fields surveys identified that there is native vegetation present on site in the form of derived low-conservation value native groundcover (i.e. native grasses) ranging from 0% to 45% (averaging 20% across the site) that has very low species diversity with at least 50% cover of exotic grasses/forbs and six scattered native trees. Specifically, there are two medium sized Poplar Box (*Eucalyptus populnea*) and four small to medium sized White Cypress Pine (*Callitris glaucophylla*). The low-value native groundcover cover is characteristic of semi-arid land that has previously subjected to agricultural clearing, cultivation, mechanical disturbance, significant land-forming, and livestock grazing.

Scattered native understorey species include *Bothriochloa macra* (Redgrass), *Bothriochloa decipien* (Pitted Bluegrass), *Rytidosperma* spp. (Wallaby Grasses), *Austrostipa* spp. (Spear Grasses), *Chloris truncata* (Windmill Grass), *Panicum decompositum* (Native Millet), *Lachnagrostis* sp. (Blown Grass) and *Tanacetum vulgare* (Tansy). In addition, rare occurrences of *Acacia decora* (Western Silver Wattle), *Maireana* sp. (Bluebush), *Sclerolaena birchii* (Galvanised Burr), and *Sclerolaena muricata* (Black Rolypoly) were observed.

These low-conservation value native groundcover often had at least 50% coverage of exotics including dominating species of: *Eragrostis* spp. (Lovegrasses), *Bromus* spp. (Bromes), *Cenchrus ciliaris* (Buffel Grass), *Sertaria* sp. (Pigeon Grass), *Hyparrhenia hirta* (Coolatai Grass), *Centaurea calcitrapa* (Star thistle), *Hypochaeris radicata* (Flat Weed), *Trifolium repens* (White Clover), *Rapistrum rugosum* (Turnip Weed), *Opuntia* spp (Prickly Pear) and *Lycium ferocissimum* (African Boxthorn).

Red-Gum considers that, prior to European settlement, areas currently mapped as "PCT 0 – Not Native" as well as those mapped as PCT 411 and PCT 408 were most likely representative of PCT 397, based on landscape position and the presence of relictual native species. However, this vegetation type is no longer present on the development site due to historical clearing and ongoing agricultural use.



Map 5. NSW Extant State Vegetation Type Map of the proposal site showing Plant community types within the study area. Scale: 1:15,000.

6.3 European Land Use

6.3.1 Squatting Era — Tibbereenah (Tippereena, Tiberinah, Tippereena) Run, Liverpool Plains district

The Study Area is situated in an area that once comprised part of the Tibbereenah pastoral run, comprising tens of thousands of acres (**Figure 2**). This run included Horsearm Creek (originally 'Bedlowacaboo' Creek) and its tributary, Stoney Creek. The adjoining run, 'Nunabry' (Narrabri) to the immediate west, was first taken up by Patrick Quinn in conjunction with Mr. Andrew Doyle, of Cooma, on behalf of licensee Cyrus Matthew Doyle, in 1834. At the time, Nunabry was the 'most extreme occupied country on the Namoi, Tippereena having been previously occupied by the representatives of the late W. C. Wentworth.'¹ In 1848, when the pastoral licences were switched to leaseholds, Wentworth still held 'Tipperina', along with the nearby 'Gallathra' (Galathira) pastoral run.²



Figure 2: Excerpt from 'Reuss & Browne's map of New South Wales and part of Queensland...', showing the Study Area's position on Tibbereenah pastoral run. (Source: State Library of New South Wales).

Wentworth sold Tipperina to the owner of Nunabry, J. C. Lloyd, in 1854; and Lloyd's overseer, Patrick Quinn, took charge.³ Lloyd took on a partner, Howell; and by 1873, when Lloyd and Howell advertised their pastoral holdings for sale, Tipperina run had been combined with Baan Baa, Wallah and Tarriabo runs, to form Tarriabo station.⁴

¹ 'One of the Namoi Pioneers. THE LATE MR. PATRICK QUINN. (Narrabri Herald, May 11)', *The Maitland Mercury and Hunter River General Advertiser*, Tuesday 16 May 1876 - Page 8.

² 'Government Gazette Notices', *New South Wales Government Gazette*, Tuesday 1 February 1848 - Page 158.

³ 'Classified Advertising' *The Maitland Mercury and Hunter River General Advertiser*, Saturday 23 December 1854 - Page 3.

⁴ 'Advertising', *The Maitland Mercury and Hunter River General Advertiser*, Tuesday 21 January 1873 - Page 1.

6.3.2 *Parish of Tippereena, County of Nandewar*

The Robertsons Land Acts (two pieces of legislation aimed at reforming land ownership and encouraging settlement) passed in New South Wales in 1861, established a system for legally occupying and purchasing Crown land, in particular, allowing individuals (commonly referred to as 'selectors') to select and purchase freehold blocks of land. To enable freehold 'selection' in the area of Tippereena, the land was surveyed and the Parish of Tippereena was formed. The earliest completed land sales in the Parish of Tippereena occurred during the mid-to-late 1870s. Under this survey, the Study Area was contained within Allotment 139, which was purchased by William Jolly in March 1877.⁵ It is likely that the land was largely cleared during this period, as the Land Acts generally included provisions for the 'improvement' of the land as a condition of purchase. Allotment 139 was eventually acquired by the Commercial Bank of Australasia,⁶ possibly as the result of the owner's default on a loan.

However, Allotment 139 was technically unlikely to have been a free-hold selection taken up under the Robertson Land Acts. Freehold selections were permitted to be up to 320 acres in size, whereas Allotment 139 was 640 acres in size. This is more typical of an area acquired as a 'pre-emptive right'. Pre-emptive rights were granted to leaseholders under 1847 Orders-in-Council, which gave leaseholders (i.e. 'squatters') the right to purchase up to 640 acres of the land they already occupied, before it was offered for sale to others.

This pre-emptive right provision was intended to recognise and grant protection to improvements made upon land by the prior leaseholders, and was typically used by them to purchase the land around their homesteads, which contained the key improvements such as housing, farm buildings, and cultivated and fenced paddocks.

The size of Allotment 139 suggests that it may have been a pre-emptive right for Tipperina station, although the homestead would have been located closer to Stoney Creek, rather than where the Study Area is situated. It is possible that William Jolly was the leaseholder of Tibberina during the 1870s, and that in light of the freehold selection taking place around the Parish, he opted to acquire the homestead in order to protect it from being acquired by a selector (**Figure 3**).

⁵ 'Parish of Tippereena, County of Nandewar: Land District of Narrabri,' c.1884. NSW Land Registry Services, State of New South Wales.

⁶ 'Parish of Tippereena, County of Nandewar: Land District of Narrabri, Namoi Shire, Central Division N.S.W.', compiled, drawn and printed at the Department of Lands, Sydney N.S.W
Call Number: MAP G8971.G46 svar (Copy 1), 1930, National Library of Australia.

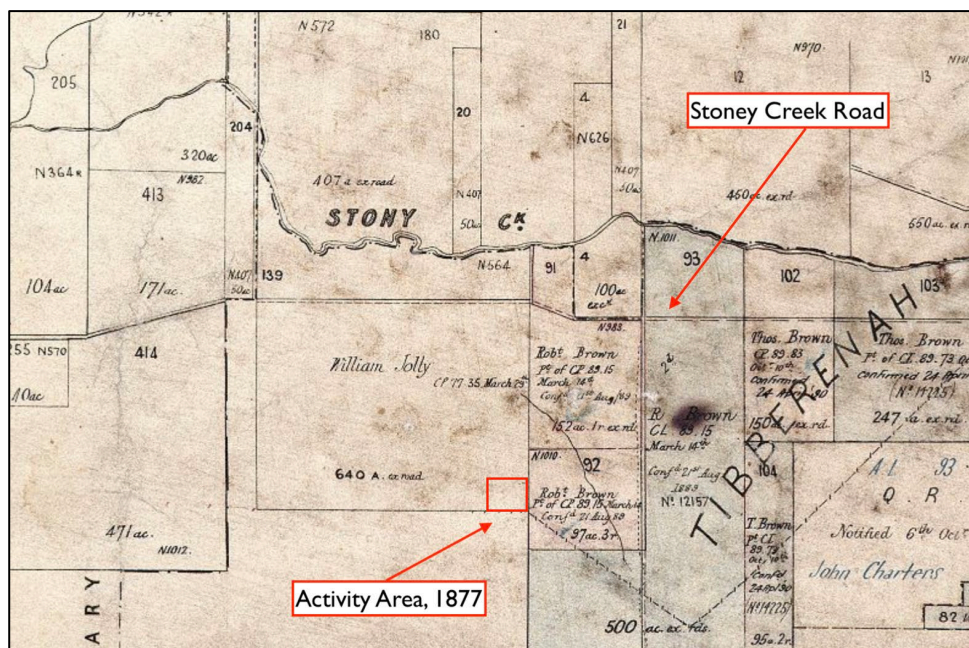


Figure 3: Excerpt from 'Parish of Tippereena, County of Nandewar: Land District of Narrabri, 'c.1884, showing the Study Area as a part of William Jolly's freehold allotment (possibly pre-emptive right), taken up in 1877. (Source: New South Wales Land Registry Services).

6.3.3 Twentieth century usage

An aerial photograph from 1964 illustrates that the Study Area had been almost completely cleared of native vegetation, with the exception of three remaining mature trees. Some slight erosion within the area is evident (Figure 4).

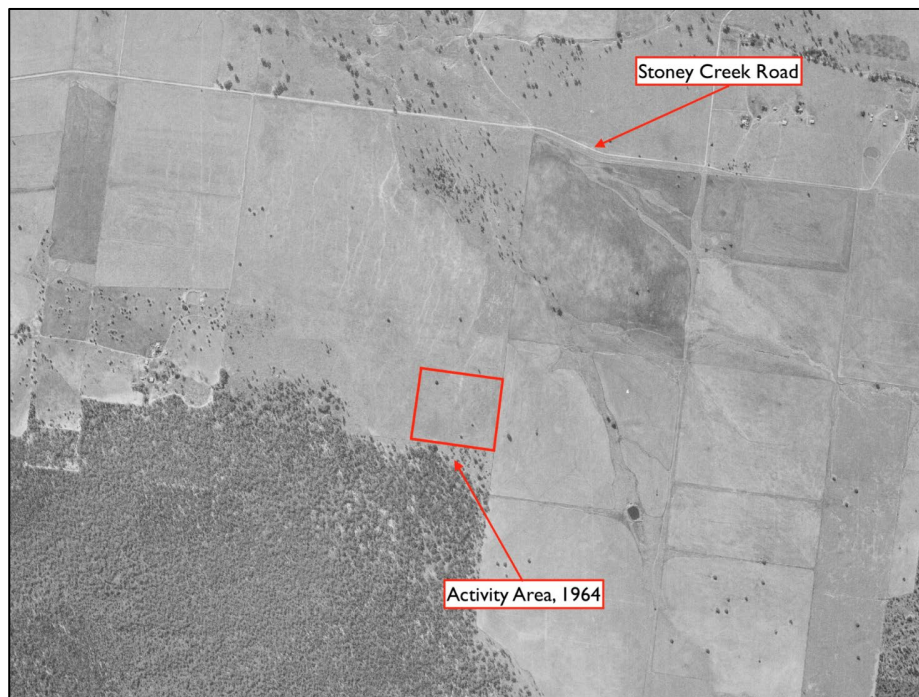


Figure 4: Excerpt from Historic aerial photo 'Narrabri', illustrating the Study Area in 1964 (Source: New South Wales Spatial Services).

Another aerial photograph from 1972 shows that the Study Area has undergone no substantial change in the last eight years, although this image illustrates that the property in which the Study Area is situated is being cropped (**Figure 5**).

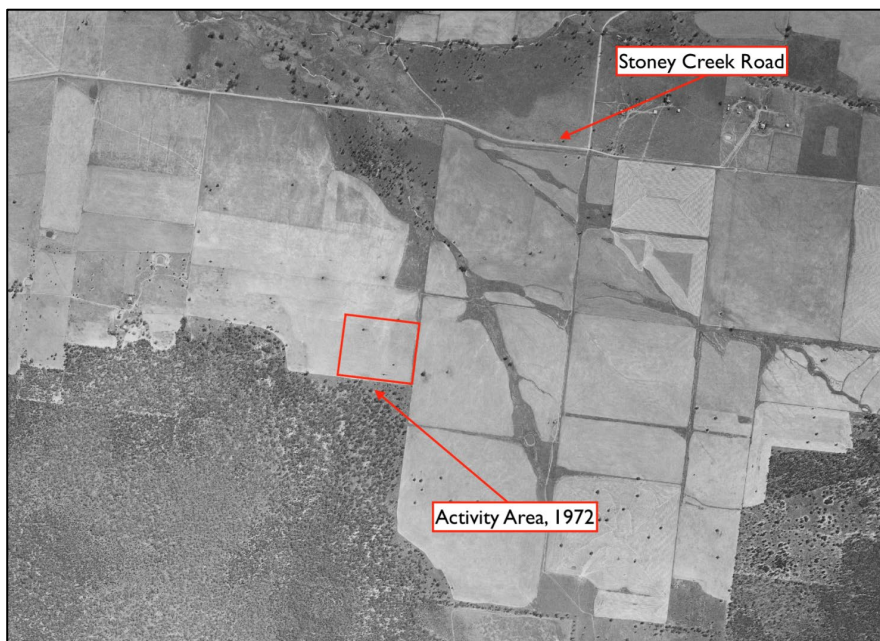


Figure 5: Excerpt from Historic aerial photo 'Narrabri', illustrating the Study Area in 1972 (Source: New South Wales Spatial Services).

Sometime between 1972 and 1985, the Allotment in which the Study Area is situated was contour graded, with bunds placed along natural drainage lines (none within the Study Area)⁷ (**Figure 6**).

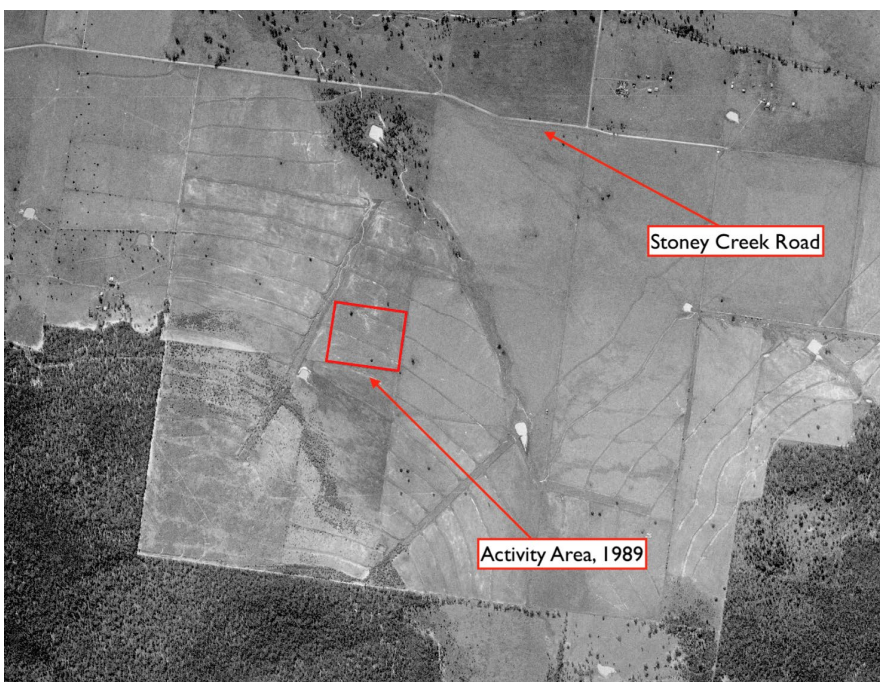


Figure 6: Excerpt from Historic aerial photo 'Narrabri', illustrating the Study Area in 1989 (Source: New South Wales Spatial Services).

⁷ A 1985 aerial photograph from Google Earth illustrates the area as contour-graded at this time.

In an aerial image from 2006, the contours are still evident, and areas of soil are exposed through recent cropping in the Study Area **Figure 7**). The Study Area in 2025 remains virtually unchanged since this time.



Figure 7: Aerial image illustrating the Study Area in 2006, sourced from Google Earth Pro.

6.3.4 Conclusion

The Study Area has been occupied and utilised by non-Aboriginal people to graze sheep at least since 1834. Pastoral usage of the area was disrupted by freehold selection during the 1870s and 1880s, during which time significant land clearing was undertaken, and land use began to incorporate cropping. No major change to the Study Area has taken place since this time, with the notable exception of contour grading, undertaken to prevent erosion, conserve water and improve crop outcomes.

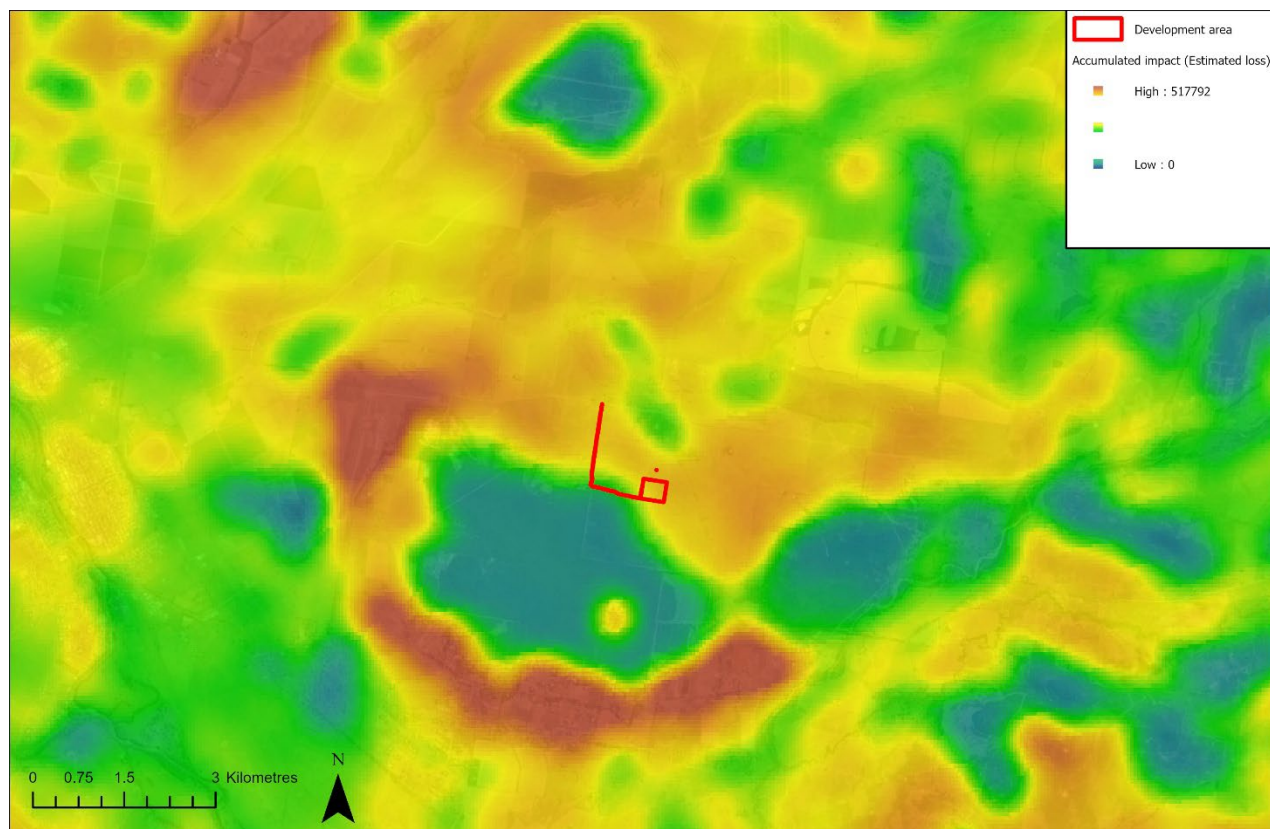
6.3.5 Aboriginal Site Decision Support Tool (ASDST) – Accumulated Impacts

The accumulated impacts described herein are perhaps best reflected in the outputs from the Aboriginal Site Decision Support Tool (ASDST, current version 7.5) which was developed to support the conservation of Aboriginal site heritage and assessment of Aboriginal site issues at the landscape scale in NSW. It was first developed in 2012 by the Office of Environment and Heritage (NSW Government 2024) (see **Section 6.9**). The accumulated impacts layer is derived from the difference between the pre1750 models and the current models for each feature type, which are then summed together (it reflects the combined impacts across all the nine features modelled) (Ridges 2010).

Areas with high values in the layer reflect areas where the majority of feature types have been heavily impacted. Areas where the accumulated impact has been low may have a comparatively high chance of preserving features close to the relative likelihood indicated in the pre1750 models (Ridges 2010). Areas where the accumulated impacts are high have little chance of preserving Aboriginal site features, or they are

likely to be in a highly degraded state (Ridges 2010). The accumulated impacts layer provides a landscape perspective and can be useful in assessing the conservation significance of a site (Ridges 2010).

*The tool predicts that the assessment area has been subject to 'moderate' to 'high' historical disturbance for the main development site, while the section of access way through the remaining vegetated area (on an existing gravel trail) has been subject to 'moderate' to 'low' impacts (**Map 6**).*



Map 6: Accumulated impacts. Scale: 1:100,000 (ASDST, available from datasets.seed.nsw.gov.au).

6.4 Site Records

An AHIMS search was conducted on 12/01/26 and returned zero (0) records within the site boundary or property. Fourteen (14) records exist within a six (6) kilometre buffer of the site (**Map 7**). The closest Aboriginal Cultural Heritage site to the Study Area was recorded 2.4 km south east of the site (Bullawa Creek SCA 3 Grinding Grooves, 19-3-0080 and Bullawa Creek SCA site 4 ochre, 19-3-0081 – grinding grooves and an ochre quarry) (**Map 6**). These sites are located in Bullawa Creek State Conservation Area. The dominant site type is scarred/modified trees (8), and there are two grinding groove sites; two artefact sites and a combined stone quarry and artefact site; and an ochre quarry.

A search of AHIMS for the broader region indicated that only a small number of assessments had been undertaken. It should be noted that the AHIMS database reflects Aboriginal sites that have been officially recorded and included on the list. Large areas of NSW have not been subject to systematic, archaeological survey; hence AHIMS listings may reflect previous survey patterns and should not be considered a complete list of Aboriginal sites within a given area.

Based on previous archaeological investigation in the region and knowledge of Aboriginal cultural practices and traditional activities, the proposal area has the potential to contain archaeological sites, especially given that Aboriginal people have lived in the region for tens of thousands of years. This would most likely be in the form of artefacts and modified trees where remnant vegetation of sufficient age remains.

Previous surveys in the local region demonstrate that there is a strong, complex and varied pattern of human use and movement throughout the landscape. This is apparent from the range of site types distributed and concentrated in specific landforms across the region. There appears to be a strong association between the presence of potential resources for Aboriginal use and the presence of archaeological sites. Areas directly associated with water and elevated ground appear to have the greatest potential for identification for Aboriginal cultural material.

Background research undertaken for this report, however, has indicated that there has been a lack of coordinated research into Aboriginal archaeology in the study area. As such, these results do not necessarily represent the full range of archaeological sites which may be identified within the study area.

6.5 Landscape Features

The Due Diligence Code (DECCW, 2010a) specifies a number of landscape features which are most associated with the likely presence of Aboriginal objects and which therefore require further assessment if present. These are areas that are land: within 200m of waters; located within a sand dune system; located on a ridge top, ridge line or headland; located within 200m below or above a cliff face; within 20m of or in a cave, rock shelter, or a cave mouth. None of these are relevant factors for the Study Area. All areas were subject to archaeological survey regardless of the landform feature.

The landform for the survey was determined to be a combination of plains, mid-slope and upper-slopes. The section of the access way aligned north/south was a plains landform before transitioning to mid-slope and upper-slope landform for the section of access way through the vegetated area. The bulk of the site (where the solar array is proposed) was mid and upper slope. Only six scattered native trees remained on the property, including two medium sized Poplar Box (*Eucalyptus populnea*) and four small to medium sized White Cypress Pine (*Callitris glaucophylla*)



Map 7: AHIMS recorded sites within 6km of the study area. Scale: 65,000. Source: AHIMS

6.6 Aboriginal People in the Region

The Study Area is situated in the centre of the traditional lands of the Gamilaroi peoples (also spelled Gomeroi, Gamilaraay, Kamilaroi). Gamilaroi (Gamilaraay) is a language name, combining the word for 'no' in that language, 'gamil',⁸ with the suffix '—roi' or '—raay' denoting 'to have'.⁹ The commencement of language names with the word for 'no' is common across much of south-eastern Australia. The suffix '—roi', being a comitative case indicating 'to have' or 'with', is also identifiable in a number of Gamilaroi place names that incorporate the suffix '—bri', including Narrabri, Boggabri and Cuttabri. Gamilaroi is one of the largest languages groups on the eastern Australian seaboard in terms of the wide geographical area in which it was spoken.

Within this broad language group, there were numerous identifiable local groups (also often referred to as 'clans' or 'tribes') occupying specific areas of country. Alfred Howitt noted that the 'Kamilaroi nation was comprised of tribes each occupying a definite tract of country which it claimed as its *taurai* or 'food ground'. Although Howitt did not record any of the names for these clans, he did include the geographic position of some of these *taurai*: '(1) Singleton to Mussel Brook (2) Mussel Brook to Murrundindi (3) Murrundindi to Querindi (4) Querindi to Gunnedah (5) Gunnedah to Bogabri (6) Bogabri to Narrabri (7) Narrabri to Pilliga (5) Pilliga to Walgett, and there was also a sub tribe at Barraba [on the Manilla River].'¹⁰ Howitt also noted that the boundaries of these 'sub-tribes' were well-defined, and that no stranger would enter them in search of food.¹¹ Howitt's list is suggestive of the Study Area being located with the *taurai* situated from 'Bogabri to Narrabri'.

In detailing the initiation ceremonies in which young men were initiated to adulthood, R. H. Mathews explained that when Gamilaroi people gathered for these ceremonies, each of these local groups would occupy the side of the encampment which faced the direction of 'their own *tauri* or country — the camp of the head-man who summoned the tribes being the initial point from which all the others radiated'.¹²

Gamilaroi people were organised not only geographically into local groups, but also socially, into moieties. Alfred Howitt noted that the 'Wallaroi [ie: Wailwan], Kamilaroi and Wiradjuri tribes' all had the same social organisation'.¹³ He also explained that, 'It may be laid down as a general proposition that all Australian tribes are divided into two moieties which intermarry with each other, and each of which is forbidden to marry within itself. 'The moiety system used by the Gamilaroi was, in the first instance, a two part system between (in Gamilaroi language) the *dhilbay* (crow) and *gubadhin* (eagle), which was a common division among many language groups on the eastern sea board.¹⁴ However, each of these moieties was further divided into two sub-sections, and each section was assigned a series of totems (in Gamilaroi language, *dheeh*). These moiety sections, sub-sections and totems guided options for marriage partners, and also arranged a person's place in the world.

⁸ E. M. Curr, *The Australian Race, Its Origins, Languages and Customs, Volume 3*, John Ferres, Government Printer, Melbourne 1887, p.304.

⁹ OzArk Environment and Heritage, *Narrabri LGA Aboriginal Cultural Heritage Study Part One: Report*, report written for Narrabri Shire Council, 2020, p.16.

¹⁰ Alfred Howitt, 'The organization of Australian tribes' catalogued as XM690, Museum of Victoria.

¹¹ Alfred Howitt, *Native Tribes of South-East Australia*, Macmillan, London, 1904, p.57.

¹² R. H. Mathews, 'The Bora or Initiation Ceremonies of the Kamilaroi Tribe,' *Journal of the Anthropological Institute*, Volume XXIV, 1895, pp:411-427.

¹³ Alfred Howitt, 1904, op cit., p.58.

¹⁴ *ibid.*, p.142.

Dheeh (totems) were generally named after animals, but could be also inanimate objects such as heavenly bodies, seasons, and even weather events, such as thunder. R. H. Mathews explained that a person's 'totem is supposed to watch over his welfare, and forewarn him of the designs of his enemies. If any of his friends are away in a different part of the tribal territory, and sickness or death overtakes them, or they meet with a serious accident, his totem appears in sight, by which he knows there is something wrong.'¹⁵

The Gamilaroi people utilised a wide range of plant and animal species. The Study Area, which is close to Narrabri on the Namoi River and Narrabri Creek, is located in plains country which was originally semi-arid grasslands that were thought to have been a 'grain belt' for Gamilaroi people.¹⁶ Archaeologist Isabel McBryde observed of Gamilaroi country that there was a 'greater frequency of grinding stones on the plains west of the ranges.' It is also likely that native plant food associated with the area such as melons (*Cucumis trigona*), potatoes (*milaa*), yams (*gubiyaay* or *Dioscorea* sp.) and wild oranges (*bambul*, *Capparis mitchellii*) were consumed by the inhabitants of the region. However, written sources from the early colonial period suggest that Kamilaroi peoples preferred animal foods, especially possum, yabbies and fish.¹⁷ 'Fishing was carried on with nets and spears, and by means of weirs constructed with boughs and stakes, to the opening of which is affixed a long bag-net.'¹⁸

Cloaks were made of possum skins and occasionally of the skins of young kangaroo. Bags and nets were made of tough grass or of the bark of the kurrajong-tree, 'some of them being prettily and all of them substantially manufactured... [and] For weapons they [had] boomerangs of both kinds, clubs, [and] spears which are thrown by hand and not with the *wommer*, many of these implements being elaborately carved.'¹⁹

6.7 Previous Archaeological Studies

The following reports have been drawn from the AHIMS database (reports conducted within the broader search area around the site, an approximately 10km radius around the site), as well as reports from the broader region. Additionally, Aboriginal Cultural Heritage Assessment Reports (ACHA) available for SSD nearby the Study Area have been included.

OzArk Environment and Heritage (OzArk) were engaged by Narrabri Shire Council to complete an Aboriginal Heritage Study over the Narrabri LGA in 2020 (OzArk 2020). The project involved consultation with relevant Aboriginal persons and community workshops, and as a result several places were put forward by the local Aboriginal community as being significant and warranting further investigation and potential inclusion in the Narrabri LEP.

Eight places were recommended for inclusion in the LEP. No field survey or site visits were undertaken as part of the survey. An AHIMS search conducted by OzArk for the survey for the majority of the Narrabri LGA (excluding Boggabri, which had been highly surveyed for previous mining assessments) found 537 sites, the most frequent being artefact scatters (36.5%), followed by modified trees (34.1%) and isolated finds (12.3%). The results are skewed by recordings being associated with major population centres, transport routes, and national parks or state conservation areas. Clusters throughout the LGA are likely due to development approvals and coal mines. The study reports that over half the sites in Narrabri are open sites (n=283, open

¹⁵ R. H. Mathews, 'The Kamilaroi Divisions,' *Science of man, Journal of the Royal Anthropological Society of Australasia*, Volume 1, Number 7, 1898, pp:155-158.

¹⁶ OzArk Environment and Heritage, op cit., p.16.

¹⁷ *ibid*.

¹⁸ E. M. Curr, op cit., p.306.

¹⁹ R. Brough Smyth, *The Aborigines of Victoria: with notes relating to the habits of the natives of other parts of Australia and Tasmania compiled from various sources for the Government of Victoria*, two volumes, John Ferres, government printer, Melbourne, 1878, pp:304-305.

camp, PADs, hearths, bora rings, burials, and shell mounds) with most being artefact sites. One hundred and eighty three (n=183) are modified or scarred trees (and most of these will have been cleared, and mis-recordings can occur), 57 are grooves/quarries/stone arrangements and 14 comprise resource gathering sites/ceremonial and dreaming sites/water holes (OzArk 2020).

Nearly half of all sites are within 200m of any watercourse (not just a named watercourse). Site types are mostly open sites, followed by modified and scarred trees. There is a large difference in the number of sites within four hundred metres (400 m) of any watercourse compared to only named watercourses. This indicates that Aboriginal occupation of the landscape occurred in proximity to watercourses, including the minor or non-perennial watercourses, prevalent throughout the Narrabri LGA (OzArk 2020).

Within the Narrabri LGA, there is a difference in the amount of AHIMS sites in each bioregion. The Pilliga Outwash has the highest frequency of sites (34%), followed nearly evenly by Liverpool Plains (34%). Aboriginal sites are more likely to be recorded in the Brigalow Belt South bioregion than either the Darling Riverine Plains bioregion or the Nandewar bioregion. With regards, to Mitchell Landscapes, the alluvial plains (37%) and uplands (30%) have the highest frequency of recorded sites, followed by the channels and floodplains (20%), slopes and plains (9%), sands, outwash sand and aeolian sands (3%) and tops (1%). These results were unsurprising to the authors as much of the Narrabri LGA is either alluvial plains, uplands, or slopes and plains landscapes (OzArk 2020).

OzArk employed the ASDST, and found high impact areas typically include those that have been mined, dense urban areas, or areas that have been cleared and regularly cropped. Low impact areas included locations such as long-established national parks, rangelands, or where agricultural activity has been restricted to livestock grazing. A large proportion of the Narrabri LGA is classified as having low-moderate or moderate accumulated impacts. There are also a few areas of low, moderate-high or high impacts. The areas of moderate-high or high impacts are mostly related to urban centres including Narrabri, Wee Waa, Boggabri, Bellata. There are a high proportion of AHIMS sites recorded in areas where accumulated impacts are moderate-low (n=302, 56%) or moderate (n=191, 36%). Only seven (7) per cent of AHIMS sites are in areas categorised as having moderate-high (n=37, 6.9%) or high (n=1, 0.2%) accumulated impacts. Very little of the LGA was mapped as having this level of accumulated impact (OzArk 2020). OzArk concluded that:

- With regards to drainage, nearly half (n=265) of the AHIMS sites are within two hundred metres (200 m) of a natural water source, while nearly all of the sites are within one kilometre (1 km) of water (n=502).
- With regards to sub bioregions, 68% of sites are in either the Pilliga Outwash or Liverpool Plains sub bioregions. Overall, the majority of sites are in the Brigalow Belt South bioregion (n=482).
- With regards to landscape types, most sites (70%) are in the alluvial plains landscape type. The alluvial plains have the greatest number of scarred trees (n=114).
- Most sites have been recorded where accumulated impacts are categorised as low-moderate or moderate, with very little of the LGA classified as having low accumulated impacts.
- Most sites are recorded in areas where the land use category is either production from relatively natural environments or conservation and natural environments (the less destructive nature of these land uses would have helped to preserve sites to a certain degree).
- When sites recorded in mining districts are included in the analysis, the results become slightly skewed. This is most apparent regarding the landscape types where at least half of the sites recorded in the Uplands landscape type are within mining districts (n=98). However, this skew does not appear to unduly affect the other variables, especially regarding drainage features.

Overall, the Narrabri LGA has a large number of water courses, especially minor drainage lines. These readily available water sources would have possibly been used during differing seasons, making travelling over distances less precarious for the local Aboriginals (OzArk 2020). The LGA contains large areas of relic floodplains and terraces making it difficult to predict where sites may be located as the landscape has altered markedly over time.

This report predicted a high likelihood of Aboriginal sites within 200m of natural water sources and within 50m of Aboriginal sites (excluding areas with moderate-high accumulated impacts); moderate likelihood in conservation and natural environments or areas subject to production from natural environments in alluvial plains, uplands or channels and floodplains; and low likelihood everywhere else.

OzArk summarised major assessments that have been undertaken in the Narrabri LGA, including for mining projects, including (all summaries below are from OzArk (2020)):

- **Silcox & Bowdler (1982) Archaeological survey of a proposed transmission line Walgett to Narrabri**
Inside Narrabri LGA, there were eight (8) sites recorded along the proposed 66kV electricity transmission line. Five (5) sites are scarred trees, and three (3) sites artefact scatters.
- **Balme (1986) North Central Rivers Archaeological Project**
The purpose of the study was to provide a regional archaeological context for the North Central Rivers including the Narrabri LGA. Three hundred and twenty-two (322) sites were compiled from previous assessments and an additional ninety-six (96) identified. There was widespread 'recent evidence' of Aboriginal culture (modified trees and bora grounds) but few datable site contexts reflecting regional culture before colonial contact. Areas in the north and west tended to contain silcrete artefacts, whereas the south and west had a higher number of quartz tools and debitage (Balme 1986: 181–3).
- **Roberts (1991) Investigation of Aboriginal Archaeological resources of the Pilliga Forests**
Roberts identified eighty-nine (89) sites, mostly scarred trees (n=62). Concluded that burial sites, rock engravings and art were unlikely in the Pilliga Forests due to soil conditions. Likely to have been a higher number of modified trees before post-contact logging.
- **Purcell (2002) Brigalow Belt South Bioregion Aboriginal Cultural Heritage Assessment**
Identified and compiled records of one thousand and two (1,002) sites in the BBS bioregion, with the highest number of sites occurring in alluvial landforms (n=668). 90% of sites occurred within 200–300 m of water.
- **Sneddon & Whincop (2017) Aboriginal Heritage Conservation Strategy: Maules Creek coal mine, Tarrawonga coal project, Boggabri coal mine and related biodiversity offset areas**
Includes desktop assessment, cultural values assessment, proposed methodology for targeted assessments, recording of cultural values and conservation of Aboriginal heritage values.
- **NSW National Parks and Wildlife Service (2006) Mount Kaputar National Park Plan of Management**
Twenty-five (25) Aboriginal sites recorded in the NP, including campsites, scarred tree, rock carvings, and artefacts. There is also a possible stone arrangement on the Kaputar Plateau, a midden on Spring Creek and axe grinding grooves on Carinya. No comprehensive survey has occurred in the NP.
- **Maules Creek Coal Project**
 - **Haglund (1983 and 1986)** Haglund surveyed the Maules Creek Coal Mine area and identified a total of twenty-one (21) sites, predominantly stone artefact scatters on flat or gently sloping areas near temporary water sources.

- **AECOM (2010)** Recorded fifty-nine (59) new sites, mostly artefact scatters including a large site (320 artefacts) near Lawler's Waterhole in the Leard State Forest.
- **Whitehaven (2015)** The *Aboriginal Archaeology and Cultural Heritage Management Plan* for Maules Creek Coal Mine identified sixty-seven (67) Aboriginal sites that have been recorded. Forty-three (43) sites are artefact scatters and twenty-four (24) sites are isolated finds.
- **Narrabri Coal Operations**
 - **Appleton (Australian Archaeological Survey Consultants) (2007 and 2009)** 2007: Seven (7) sites identified during survey, two (2) isolated finds, two (2) artefact scatters, two (2) scarred trees and one (1) resource site. 2009: Recorded one hundred and twenty-one (121) sites, largely low-density artefact scatters and isolated finds. A place of cultural and scientific significance, a large camp with indications of repeated use, was identified at Pine Creek.
 - **Niche Environment and Heritage (2015)** Modification 5. Recorded an additional six (6) sites, all artefact scatters or isolated finds along Pine Creek and Kurrajong Creek.
- **Boggabri Coal Mine**
 - **ARAS (2002)** Assessment identified sixty-one (61) Aboriginal sites: thirty (30) artefact scatters, twenty-six (26) isolated finds and five (5) scarred trees. In 2007, forty-two (42) sites were approved for salvage.
 - **Insite (2010)** Assessment identified an additional seventy-seven (77) Aboriginal sites, including two (2) sets of grinding grooves in Leard State Forest.
 - **Kayandel (2011)** Fourteen (14) Aboriginal sites recorded during Tarrawonga Cultural Heritage assessment.
 - **Hansen Bailey (2010)** Identified one hundred and four (104) sites in the study area, including parts of the Leard State Forest. Potential for subsurface deposits in the Leard State Forest was considered high.
- **Tarrawonga Coal Project**
 - **Kayandel (2011)** No additional sites or areas of high archaeological significance identified during assessment.
 - **Whitehaven (2016)** The *Heritage Management Plan* for Tarrawonga Coal Project lists all Aboriginal sites inside mine boundary. There are one hundred and thirty-three (133) Aboriginal sites, with fifty (50) artefact scatters, fifty-nine (59) isolated finds and twenty-four (24) scarred trees

OzArk reference a 2014 study they conducted of the former Dubbo City Council LGA (now part of Western Plains Regional Council) that established a stream order correlation to site condition, which found (with the exception of two outliers) that all sites are within 500m of a stream, with most within 100m of a stream and infrequent further than 200m. Landforms within one hundred metres (100m) of streams that would be expected to provide more reliable water supplies (i.e. those with an order number of three (3) or greater) are likely to contain most sites in that area. The density of sites on the floodplain and channels landform is greater than elsewhere despite the expected losses from human disturbance, hydrology and erosion. This was seen by OzArk (2014) as an expected outcome, as the location of Aboriginal sites has a strong correlation with the proximity of water sources.

In 2016, OzArk undertook an assessment of Travelling Stock Reserves (TSR) in the Central West Local Land Services area. This study correlated site location with broad landscape types (channels and floodplains, alluvial plains, slopes, uplands, downs) and found:

- The highest concentration of sites is within channel and floodplain landscapes (n=927).
- The second highest number of sites (n=876) recorded in slope landscapes (perhaps biased by the fact that Dubbo is located within this landscape type and the highest number of sites in area have been recorded in and around Dubbo).
- Alluvial plains landscapes have the third highest concentration of sites (n=770).
- A reasonable number of sites have been recorded in downs landscapes (n=255), perhaps skewed by three-four clusters of sites, and it is suspected the actual number of sites in downs landscapes would be lower.
- Relatively small numbers of sites are recorded in uplands (n=5) or plateau landscapes (n=34).

These results broadly agree with the observations of OzArk 2014 that the higher density of sites are in landforms in closer proximity to water. A targeted survey was conducted and 59 sites were found (26 scarred trees, 22 artefact scatters, 11 isolated finds). Most sites will be recorded within channels and floodplains, and slopes landscapes. Sites in channels and floodplains landscapes are likely to be scarred trees, while those in slopes landscapes are likely to be artefact scatters.

Virtus Heritage (2025) prepared an Aboriginal Cultural Heritage Assessment for the proposed SSD Stoney Creek BESS, at 41 Stoney Creek Road, Narrabri. This site is about 6km west of the proposed site of the Narrabri North Solar Farm. One new site (SC_AS1, AHIMS ID 19-3-0302) was recorded during the site survey, comprising an artefact scatter in a secondary depositional context (n=14), with no associated potential archaeological deposit. The artefacts consisted of broken flakes and flakes within the project area, and were not considered unusual scientifically but have high cultural value. The scatter was identified as a low-density background scatter in a disturbed context in a ploughed field with no associated PAD and/or integrity. (Virtus Heritage 2025)

Griffith (1994) prepared a report for the proposed up-grading and alterations to the Barraba-Mount Kaputar four-wheel drive vehicle track in Mount Kaputar National Park, 2km south-east of Brushy Mountain, running north-west for 6 kilometres to Mount Lindsay. The track follows the ridge-tops of the Nandewar Range in Mount Kaputar National Park, 45 km north-east of Narrabri. Site types most likely to occur were predicted to be quarries, open artefact scatters, scarred trees, bora rings, open campsites and axe grinding grooves. A series of pedestrian transects across the route were undertaken. Ground visibility was very good (90-100%). No sites were found (Griffith 1994).

OzArk (2019) prepared an Aboriginal and Historic Impact Assessment for Silverleaf Solar Farm, covering an area of 450 hectares between Logans Lane and the Newell Highway, approximately five kilometres north of Narrabri. The site is approximately 5.5 km west, at its closest point, of the proposed Narrabri North Solar Farm. The associated transmission line easement consists primarily of existing road corridors or electricity easements. Pedestrian survey of the study area was undertaken with representatives of the Narrabri Local Aboriginal Land Council and Gomeroi Native Title Claim Group. During the pedestrian survey, two Aboriginal sites were recorded: Silverleaf IF-1 (#19-3-0163) (silcrete proximal flake) and Silverleaf IF-2 (#19-3-0164) (quartzite proximal flake fragment), both isolated artefacts in disturbed contexts without associated subsurface deposits. No historic sites were recorded during the survey.

It was assessed that there was low potential for further sites or *in situ* subsurface archaeological deposits being present within the remainder of the study area. There were no archaeologically sensitive landforms or watercourses within the study area, meaning large complex sites (e.g. camp sites) were unlikely. The two isolated artefacts were described as 'background scatter', indicated that Aboriginal people were in the area, but provided no further scientific information.

An EIS prepared for Narrabri South Solar Farm (Melotte Consulting Sustainability 2018), 10km southeast of Narrabri, found 10 sites on the property, all culturally-modified trees (Melotte Consulting Sustainability 2018). The regional archaeological context suggests that corridors alongside waterways were natural traveling routes for resource gathering and temporary encampments. The easternmost strip of the Study Area would be especially suitable for resource gathering given its proximity to Bullawa Creek. However, it may not have been suitable for encampments as it is a floodplain. Isolated activities such as hunting, butchering, other resource gathering such as bark extraction and one-off artefact retouching all likely took place in the Study Area.

6.8 Site Types in the Geographic Region

Cultural material is dominated by flaked stone tools (lithics) and lithic sites in NSW are listed by the features of either 'Artefact' or 'PAD' (potential archaeological deposit) in the AHIMS register. While not as significant as human burials, stone artefacts have variable distribution that can largely be correlated with different landform types. Many authors have stressed the importance of proximity to water as well as relatively common-sense amenity factors such as level, well-drained areas with useful views of resource use areas or a watercourse (Brown, 2008). Stone artefacts may be found as occasional pieces (background scatter) or in concentrations typically described as 'Open Camp Sites' (even if not interpreted as having been a site where people camped). At these sites, the presence of large numbers of stone tools and the debitage from making and maintaining them provide evidence about the nature of the human use of the location. Site types that might be expected to be found in the area include:

- Isolated finds can occur anywhere. Isolated finds are a single artefact, commonly a stone tool found on the ground surface without any other associated evidence of Aboriginal occupation in the immediate vicinity. They may be indicative of random loss or deliberate discard of a single artefact; the remnant of a larger, now dispersed/disturbed artefact scatter; or may be part of an otherwise obscured or sub-surface artefact scatter. They may occur anywhere within the landscape but are more likely to occur in topographies where open artefact scatters typically occur.
- Open artefact scatters are defined as two or more artefacts (usually stone artefacts) located in an open context (e.g., not located within a rock shelter), found on the ground or within shallow subsurface deposits. This site type may occur almost anywhere that Aboriginal people have travelled, and it may be associated with hunting and gathering activities, short or long term camps, and can consist of scatters or sub-surface distributions of flaked stone discarded during the manufacture of tools, but may also include other artefactual rock types such as hearth and anvil stones. Low density scatters may be indicative of background scatter rather than a spatially or temporally distinct artefact assemblage. Artefact scatters are most likely to occur on level or low gradient contexts, along the crests of ridgelines and spurs, and elevated areas along watercourses or wetlands, with larger sites associated with permanent water sources and open basal valley slopes and the valleys of creeks that afford effective through access. Artefacts are manufactured from a variety of materials including silcrete, volcanic, quartz and fine-grained siliceous materials.

- Aboriginal scarred trees may occur anywhere old growth trees survive. The identification of scars as Aboriginal cultural heritage items can be problematical owing to natural trauma and European bark extraction.
- Hearths/ovens would generally be located in the vicinity of available resources, found in open contexts within rock shelters. This site type is considered possible in areas where A-Horizon soils are relatively undisturbed.
- Quarry sites and stone procurement sites occur where Aboriginal people extracted stone or other raw materials. They may occur in open landscapes, ridgelines, creek beds or rock outcrops and can be small to large. The presence of quarry/extraction sites is dependent on the availability of suitable rock formations.
- Burials are generally found in elevated soft sediments such as aeolian sand, alluvial silts and rock shelter deposits in association with rivers and major creeks. In valley floor and plains contexts, burials may occur in locally elevated topographies rather than poorly drained sedimentary contexts. Burials are also known to have occurred on rocky hilltops in some limited areas.

6.9 Aboriginal Site Decision Support Tool

The Aboriginal Site Decision Support Tool (ASDST, current version 7.5) was developed to support the conservation of Aboriginal site heritage and assessment of Aboriginal site issues at the landscape scale in NSW. It was first developed in 2012 by the Office of Environment and Heritage (NSW Government 2024). The first suite was published in 2016 (Version 7) at 100m resolution (in Lamberts Conic Conformal Projection) (NSW Government 2024). At the time of writing this report, the current version is 7.5. This version was produced in 2020 at 50m resolution (in Geographic Coordinate System) (NSW Government 2024).

This tool extends AHIMS by illustrating the potential distribution of site features recorded in AHIMS. It complements AHIMS by providing broad-scale datasets to place Aboriginal site heritage within the context of regional conservation planning. The ASDST illustrates the potential distribution of site features recorded in the AHIMS database. It provides a regional overview, using site predictive modelling, correlating site information from AHIMS with landscape patterns such as proximity to water, vegetation, terrain, soils and the level of accumulated impacts (NSW Government 2024).

The ASDST is designed to be used at a scale of 1:100,000 and coarser. The models within ASDST are available in two forms: pre1750 (predicts likelihood of feature distribution prior to European colonisation of NSW); and current (predicts feature likelihood in the current landscape) (State Government of NSW & NSW Department of Climate Change 2021). Cell values range from 0 – 1000, where 0 indicates low likelihood and 1000 is high likelihood (State Government of NSW & NSW Department of Climate Change 2021). The scale is likelihood – a relative measure indicating the likelihood that a grid cell may contain the feature of interest *relative* to all other cells in the layer, and is not a measure of probability (State Government of NSW & NSW Department of Climate Change 2021).

The current models are modifications of the pre 1750 models. Data including tenure, extent of native vegetation, land use mapping and mining history have been used to place parameters on the likely survival rates of different features under different types of land use and condition (Ridges 2010). Parameters were derived through consultation and a series of expert workshops (Ridges 2010). Current models take into account the relative likelihood of a landscape feature surviving under different land-use conditions (for example, there will be different likelihoods for scarred trees and stone artefacts in a cleared landscape). The current models are designed to be used in conjunction with the pre1750 models when interpreting the relative likelihood of a feature being present today.

The difference between the pre1750 model likelihood for a landscape feature and its current likelihood gives an indication of the total impact on the feature (Ridges 2010). Comparing the current model to the pre1750 model enables a visual assessment of the level of impact on that feature in that area of the landscape (Ridges 2010).

The models describe relative likelihood as it changes over the landscape across the entirety of NSW. The darkness (cells closer to 1000) is a relative quality – a black cell does not guarantee that that feature would have been located there, or would still be there today (Ridges 2010). Rather, it represents an area where the model predicts a high likelihood of that feature at that location relative to all other areas of the landscape. Similarly, white areas do not indicate an absence of that feature, but the lowest relative likelihood (Ridges 2010). The relative nature of likelihood is not directly comparable between site features. For example, an area might be modelled as high likelihood of stone quarries and artefacts, but they do not have an equal modelling probability of occurrence, as the probability of locating quarries is less as they are less frequently observed than stone artefacts (Ridges 2010). The tool also includes:

- A model of accumulated impacts: summing the difference between the pre1750 and current version of all feature models (cell values range from 0 – 1000, where 1000 is a high accumulated impact) (see **Section 6.3.3, 6.3.5**).
- A model of the reliability of predictions based on an environmental distance algorithm that looks at recorded site density across the variables used in the models.
- A survey priority map, which considers model reliability (data gap), current likelihood and accumulated impact (cell values range from 0 – 1000 where 1000 indicates highest survey priority relative to the rest of the layer) (State Government of NSW & NSW Department of Climate Change 2021).

The reliability layer indicates those parts of the landscape that have been investigated the least. Areas with high values are where the model predictions are based on the least amount of AHIMS data (Ridges 2010). Distribution of AHIMS sites spatially biased in recording density, with highest density around populated centres, roads and other infrastructure (Ridges 2010). The ASDST has been used in site potential mapping, regional context setting, model testing, survey design and assessing conservation priority (Ridges 2010).

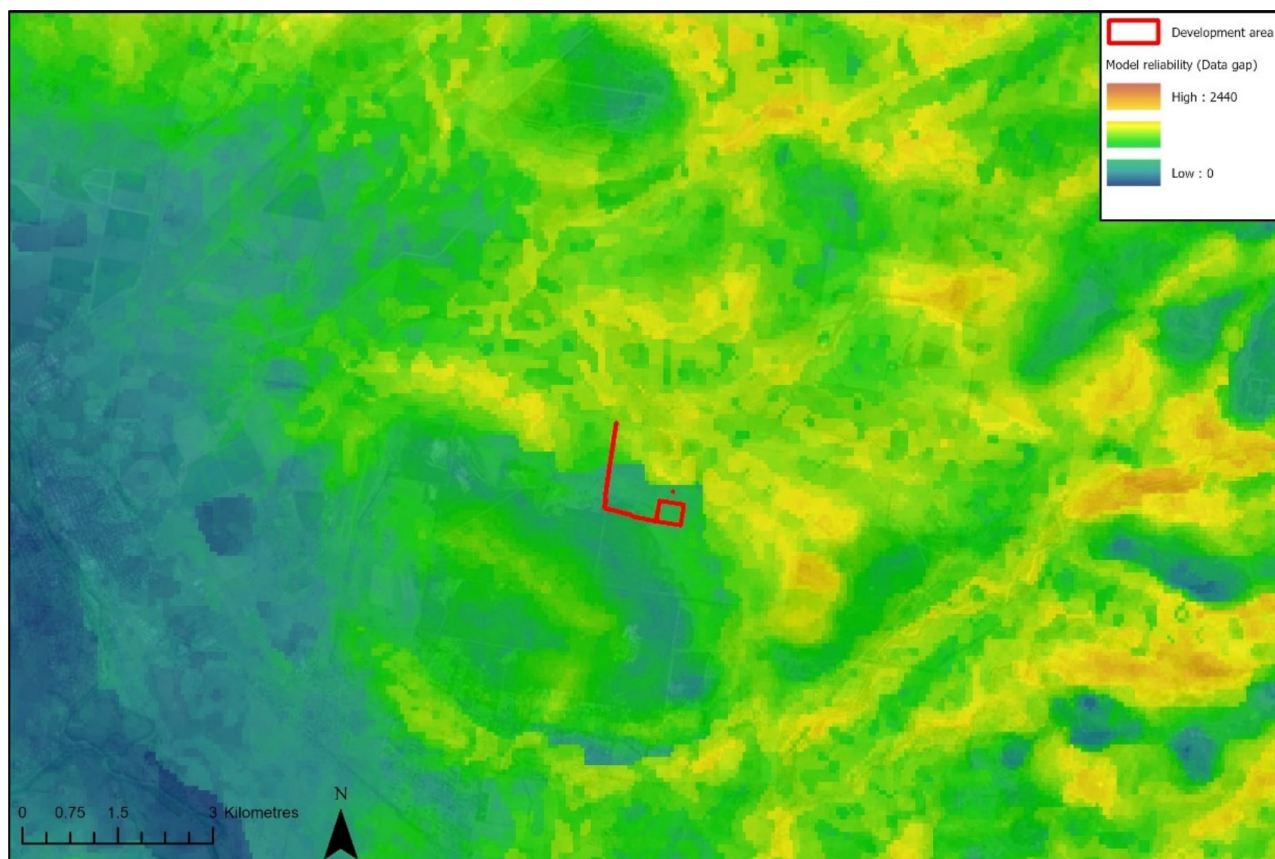
The models were utilised in this report to gain a regional overview of the site feature considered most likely to be observed in the study area (artefacts). Pre1750 and current models were compared. The relative likelihood of finding artefacts is low. Accumulative impacts were high (**Section 6.3.5**) and model reliability was low, with greater survey effort required in this geographic area.



Map 8: Pre1750 model of artefacts. Scale: 1:100,000 (ASDST, available from datasets.seed.nsw.gov.au).



Map 9: Current model of artefacts. Scale: 1:100,000 (ASDST, available from datasets.seed.nsw.gov.au).



Map 10: Model reliability. Scale: 1:100,000 (ASDST, available from datasets.seed.nsw.gov.au).

6.10 Predictive statements

A series of statements have been formulated to broadly predict the type and character of Aboriginal cultural heritage sites likely to exist throughout the study area and where they are more likely to be located. This model is based on:

- Local and regional site distribution in relation to landform features identified within the study area.
- Consideration of site type, raw material types and site densities likely to be present within the study area.
- Findings of the ethno-historical research on the potential for material traces to present within the study area.
- Potential Aboriginal use of natural resources present or once present within the study area.
- Consideration of the temporal and spatial relationships of sites within the study area and surrounding region.

Previous survey results within the region allow some predictions to be made about local site distribution:

- The study area was originally located within an accessible landscape with ample resources and many drainage lines, therefore it would have been suitable for human occupation and daily activities.
- Scarred trees are concentrated along waterways, which are the areas with the highest focus of Aboriginal land use and where a number of suitable tree species are found. Very few trees remain in the study area. Therefore the potential for scarred trees is low.
- Artefact scatters and isolated finds are considered the most likely type to be found and are the most common site type in the region.

- Quarry sites are located close to usable resource. There are no outcrops of stone in the study area.
- There is a tendency for concentrations of stone artefacts to be found within 200m of permanent and ephemeral water sources. The Study Area is just over 200 metres from the nearest creek.
- Burial sites are most typically associated with prominent raised sand hills ('source bordering dunes') near rivers. No features like this exist in the study area.
- Site impacts have been relatively high, as predicted by the ASDST and land use research, which shows significant land clearing was undertaken, land use includes cropping and contour grading has occurred.

7 Site Survey

A survey of the study area was undertaken on the 11th of August 2025 by Damian Wall of Red-Gum.

7.1 Survey Aims

The principle aims of the survey were to:

1. Undertake a systematic survey of the study area targeting areas with the potential for Aboriginal heritage.
2. Identify and record Aboriginal archaeological sites visible on the ground surface.
3. Identify and record areas of Aboriginal archaeological and cultural sensitivity.

7.2 Survey methods

The survey was conducted on foot. Recording during the survey followed the archaeological survey requirements of the code and industry best practice methodology. Information that recorded during the survey included:

- Aboriginal objects or sites present in the study area during the survey.
- Survey coverage.
- Any resources that may have potentially been exploited by Aboriginal people.
- Landform elements, distinguishable areas of land approximately 40m across or with a 20m radius.
- Photographs of the site indicating landform.
- Ground surface visibility (GSV) and areas of exposure.
- Observable past or present disturbances to the landscape from human or animal activities.
- Aboriginal artefacts, culturally modified trees or any other Aboriginal sites.

Where possible, the identification of natural soil deposits within the study area was undertaken and photographs of survey units, landform, vegetation coverage and GSV, were incorporated into the survey. If found, the location of Aboriginal cultural heritage and points marking the boundary of the landform elements were to be recorded using a hand-held Global Positioning System and the Map Grid of Australia (94) coordinate system.

In addition, a predictive assessment of the likelihood of the occurrence of undetected and/or subsurface Aboriginal cultural heritage material was conducted. This is an intuitive assessment using generalised contextual information rather than a geostatistical assessment using digitised (raster) map data of landforms and known locations of other sites. Brown (2008) notes that although intuitive assessments are rarely afforded much written favour by archaeologists, they are in fact used by almost all.

The term 'modelling' may be frequently inserted to infer statistical rigour that is usually not present nor for that matter. A *modelled predictive assessment* typically combines rule-based definitions of known site distribution factors with available mapped data that lacks the full range of detail that would affect human choices and behaviour - or the map data may quite simply be wrong (Brown O 2008).

7.2.1 Ground Surface Visibility

Archaeological visibility refers to the amount of ground surface that is clearly visible for inspection, *it is the amount of bare ground (or visibility) on the exposures which might reveal artefacts or other archaeological materials. It is important to note that visibility, on its own, is not a reliable indicator of the detectability of buried archaeological material. Things like vegetation, plant or leaf litter, loose sand, stone ground or introduced materials will affect the visibility. Put another way, visibility refers to 'what conceals'* (DECCW 2010: 39).

The greater the ground surface visibility, the more effective the surface survey. Examples of high surface visibility are vehicular and pedestrian tracks, dune blow outs (100% per m²); and examples of poor visibility are areas of heavy vegetation cover (0-10% per m²) (Murphy & Thomson 2016).

Unfortunately, it is often the case that highly visible Aboriginal cultural heritage places are also often highly disturbed. High GSV is therefore often related to the amount of disturbance that has occurred. This disturbance may be manmade (such as drainage lines, vehicle tracks), by stock (overgrazing, tracks), or due to natural processes (erosion by wind or water). The level of GSV is typically assessed as in **Table 2**.

Table 2: Ground Surface Visibility (GSV) ratings vs ranges

%	0%	0 – 10%	10 – 30%	30 – 50%	50 – 70%	70 – 90%	90 – 100%
Rating	No visible ground surface	Very poor	Poor	Fair	Good	Very good	Excellent

7.2.2 Exposure

Exposure refers to the geomorphic conditions of the local landform being surveyed and attempts to describe the relationship between those conditions and the likelihood the prevailing conditions provide for the exposure of (buried) archaeological materials (**Photo 1**). Whilst also usually expressed as a percentage estimate, exposure is different to visibility in that it is in part a summation of geomorphic processes, rather than a simple observation of the ground surface (Burke & Smith 2004). Exposure is *different to visibility because it estimates the area with a likelihood of revealing buried artefacts or deposits rather than just being an observation of the amount of bare ground. It is the percentage of land for which erosion and exposure was sufficient to reveal archaeological evidence on the surface of the ground. Put another way, exposure refers to 'what reveals'* (DECCW 2010: 37).

There were areas of exposure across the Study Area (**Map 11**). These were present across the mid-slope and upper-slope landforms.



Photo 1: Area of high exposure, mid site, north orientation. Photo: D. Wall, 2025

8 Results

8.1 Survey Coverage & Effectiveness

The purpose of compiling survey coverage data is to measure the limitations of site detectability at the time of the survey. For example, a survey transect across a heavily grassed paddock has little likelihood of finding lithic material on the surface regardless of the survey effort spent. The quantification of survey coverage data also usually relies on an assessment of the soil surface visibility in relation to other variables, principally the different landforms included in the survey and the amount of survey effort spent on each.

*The entirety of the Study Area was traversed on foot (**Map 12**). GSV ranged from poor through to very good (**Map 11**). Approximately 30% of the Study Area was poor GSV (mid-slope) due to grass cover. Approximately 40% of the Study Area had fair GSV, again on the mid-slope. Approximately 23% of the area had Good GSV, and approximately 8% had Very Good GSV (areas across the three landforms) (**Table 3**).*

Table 2: Effective survey coverage

	Survey unit area (m ²)	Average calculated GSV	Area surveyed (m ²)	% Exposure	Effective Survey Coverage (area surveyed x visibility% x exposure%) (m ²)	Effective Survey Coverage % (effective coverage area / survey unit area x 100)
Plains	3,956	80%	3,956	2	63	1.6
Mid-slope	89,818	37%	22,284	5	412	0.5
Upper-slope	10,610	67%	4,650	6	187	2

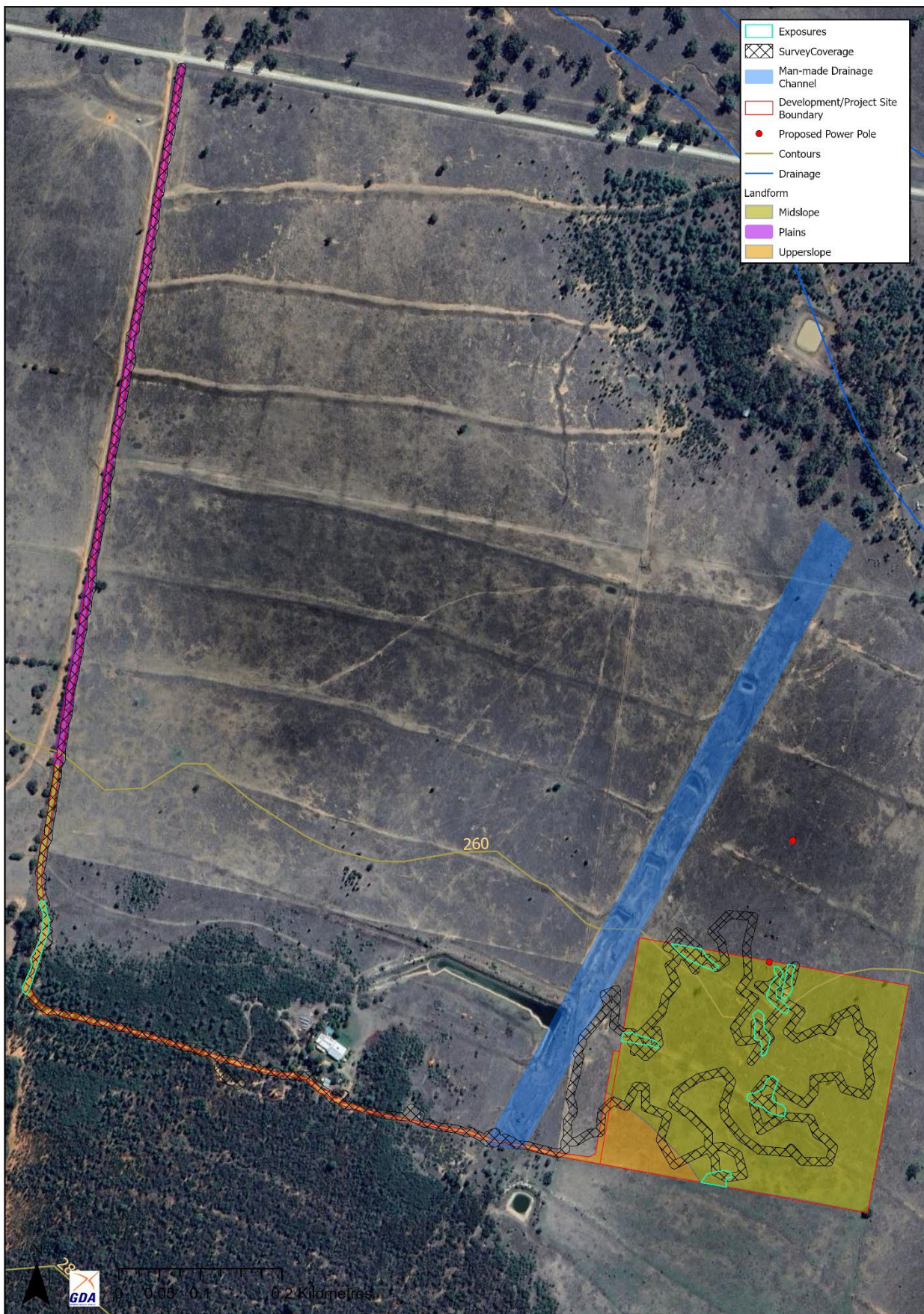
8.2 Disturbance

Disturbance in the Study Area is associated with the existing and past land use. The low-value native groundcover cover of the Study Area is characteristic of semi-arid land that has previously subjected to agricultural clearing, cultivation, mechanical disturbance, significant land-forming, and livestock grazing. The access track is an existing gravel road that has been subject to mechanical disturbance during its construction and maintenance (**Map 13**).

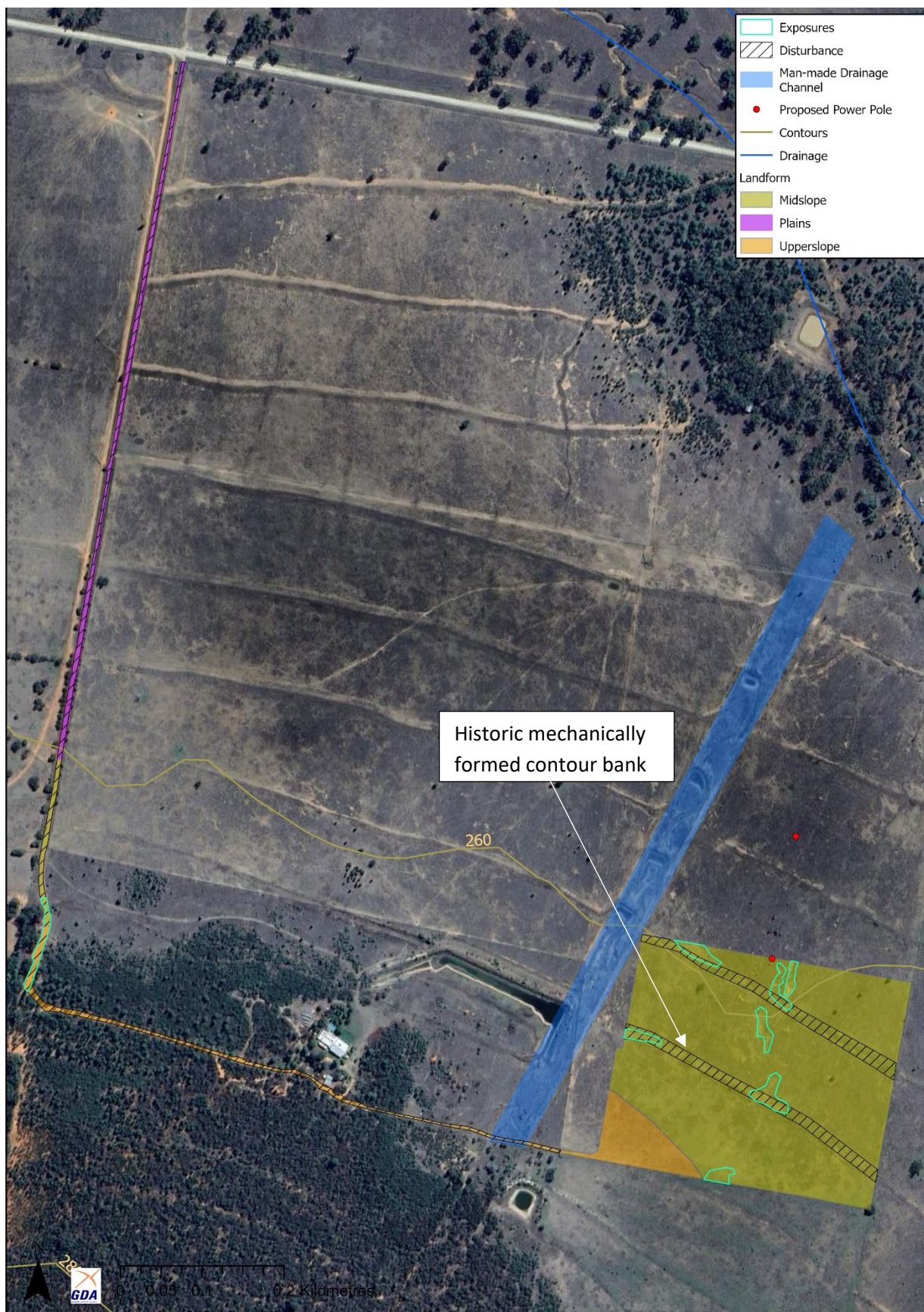
**Photo 2: Area of disturbance (existing driveway). Photo: D. Wall, 2025**



Map 11: GSV and areas of exposure in the Study Area. Scale: 1:5,500



Map 12: Survey coverage across the Study Area. Scale: 1:5,500



Map 13: Landforms and areas of disturbance in the Study Area. Scale: 1:5,500

8.3 Landform Features

It was noted during the ground survey that the development of agricultural drainage channels (just to the west of the Study Area) and mechanical land forming and contouring has removed all wholly undisturbed landforms. There are no notable landform features (i.e. raised terraces with good viewpoints over the region) present currently. The Study Area was made up of plains landscape (the northern end of the access way, existing gravel road), mid-slope and upper-slope landforms.

The area does not possess scar age trees, nor any rock shelters, caves or other landscape features that are likely PADs. Culturally scarred trees are typically > 80cm DBH, as those trees in the wider Geographic region are typically the oldest. There were no such trees within the study area or surrounds. Only six scattered native trees remained on the property, including two medium sized Poplar Box (*Eucalyptus populnea*) and four small to medium sized White Cypress Pine (*Callitris glaucophylla*).

9 Survey Outcomes

- The study area exhibited variable visibility and with some areas of exposure within a land formed paddock and existing gravel access way. Despite the low levels of exposure, the entire study site was traversed on foot and no (zero) Aboriginal objects, places or PADs were identified.
- **No (zero) trees** with cultural modifications were identified within the study area.
- **No (zero) Aboriginal cultural heritage objects** were identified within the study area.
- **The survey did not identify any undisturbed areas of potential (PADs) within the study area.**
- It is acknowledged that in the context of the ubiquitous 'background scatter' of artefacts that exists in almost any Australian landscape, undetected Aboriginal objects may be present in the fill and topsoil material that is to be returned to its original location post works.
- Mechanical disturbance at the site has completely and permanently altered the landscape to a point where no landscape features typically found in the geographic region (outside of intensive agriculture) exist.
- On the basis of desktop assessment (AHIMS records, previous work in the region and general regional site distribution patterns) and the survey, it considered that harm to Aboriginal objects as a result of the proposed work is highly unlikely at the assessed site.



Photo 3: Study Area, south west corner, north east orientation. Photo: D. Wall, 2025



Photo 4: Study Area, mid site, west orientation. Land formed contour grading. Photo: D. Wall, 2025

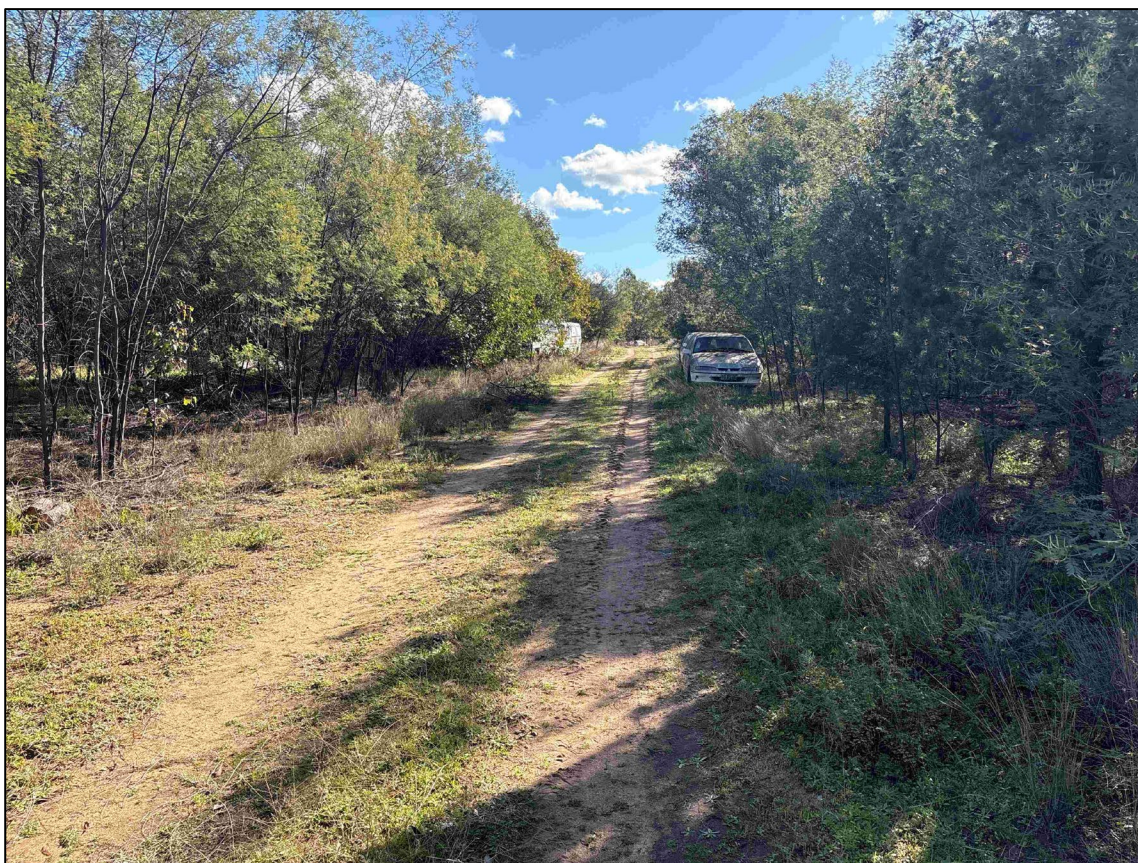


Photo 5: South west corner of site entry point, west orientation. Existing graded track. Photo: D. Wall, 2025

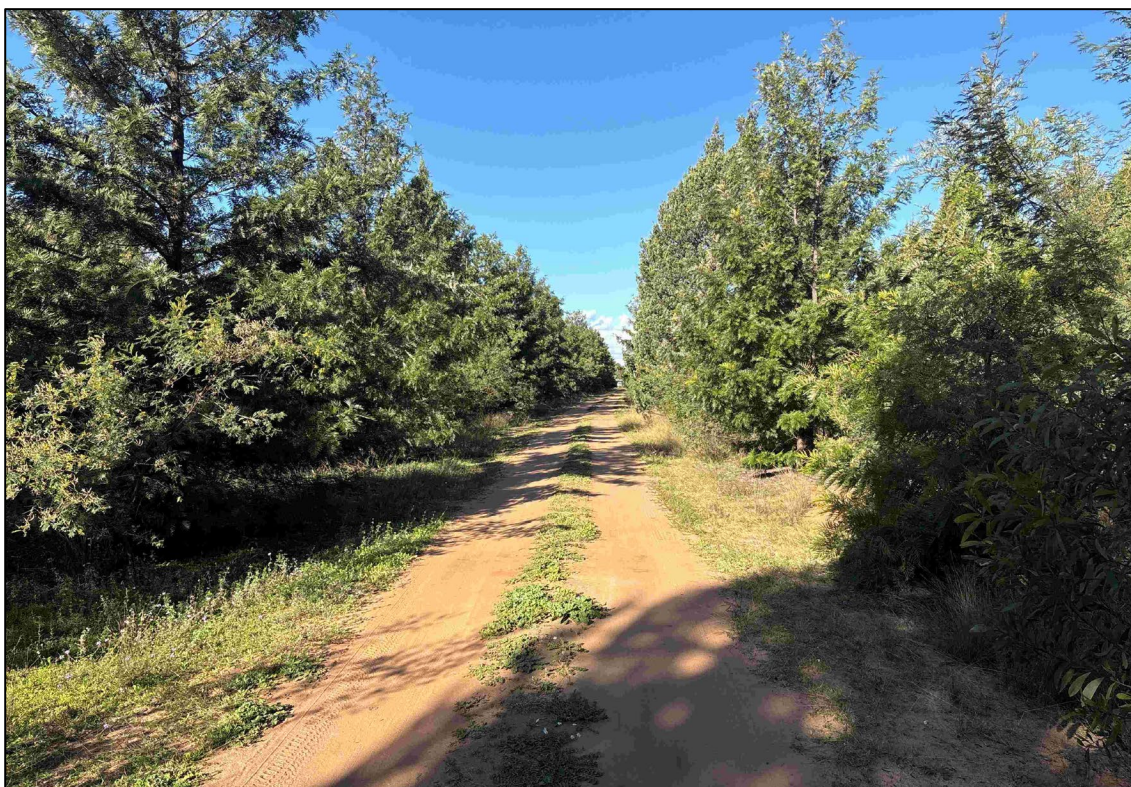


Photo 6: Site access, east orientation. Introduced Oak Species dominate in a revegetated landscape post wide scale clearing. Photo: D. Wall, 2025



Photo 7: Site access, west end, north orientation. Imported gravel over a land formed surface. Photo: D. Wall, 2025



Photo 8: Site access, entry to property, south orientation. Photo: D. Wall, 2025

10 Recommendations & Contingencies

This report documents an assessment of the potential for the project to have an impact on Aboriginal objects or places. The assessment finds that there are no (zero) previously recorded Aboriginal objects within the study area and it is not predicted that *significant potential exists* for undiscovered Aboriginal sites to be impacted. However, the author acknowledges that the ubiquitous ‘background scatter’ of artefacts exists in almost any Australian landscape.

10.1 Recommendations

1. No further assessment is considered warranted if:
 - a) Works are contained entirely to the area assessed by this ACHDDA. Any works outside of the areas assessed in this ACHDDA will require further archaeological assessment.
 - b) Works maximise the use of significantly disturbed areas in the first instance and no widening of the access way occurs
 - c) Any topsoil that is disturbed during construction must remain onsite, i.e. ensure no topsoil (0-150mm) is removed from site. All soil must be used in rehabilitation within the bounds assessed by this ACHDDA. In the unlikely event of there being Aboriginal objects in the soil and, these objects will remain within the study area.
2. An **Aboriginal Cultural Heritage Management Plan (CHMP)** is recommended to be developed following development consent to address the potential for finding additional Aboriginal artefacts during the construction. The CHMP will outline an unexpected finds protocol to deal with construction activity and include induction policies for work crews (see below).
3. A **Cultural Awareness Induction** is considered appropriate at this site before any works commence. The induction is to be undertaken by employees who are supervising works during the activity in relation to earthmoving or ground disturbance works. All ground disturbance works must be supervised by a person who has undertaken the cultural awareness training. It is the responsibility of the client to:
 - a) Ensure that the training be undertaken prior to the commencement of works to familiarise employees and contractors with local Aboriginal traditions and culture;
 - b) Familiarise employees and contractors with Aboriginal places and objects (particularly stone artefacts) so that they may recognise Aboriginal cultural heritage that may be exposed during works. Information sheets to assist in the identification of Aboriginal cultural heritage should be provided during this training.
 - c) Promote a knowledge and understanding of and respect for Aboriginal tradition and culture; and
 - d) Assist with compliance with relevant Commonwealth and State cultural heritage legislation.
4. The information presented above 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.

10.2 Contingencies

Contingency 1: Discovery of unanticipated Aboriginal objects.

All Aboriginal objects and places are protected under the National Parks and Wildlife Act 1974 (NPW Act). It is an offence to knowingly disturb an Aboriginal site without a consent permit issued by NSW DPHI. Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the NSW DPHI and Aboriginal stakeholders.

Contingency 2: Discovery of Aboriginal ancestral remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains;
2. Notify the NSW Police and NSW EPA Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location.
3. Not recommence work at that location unless authorised in writing by NSW DPHI.

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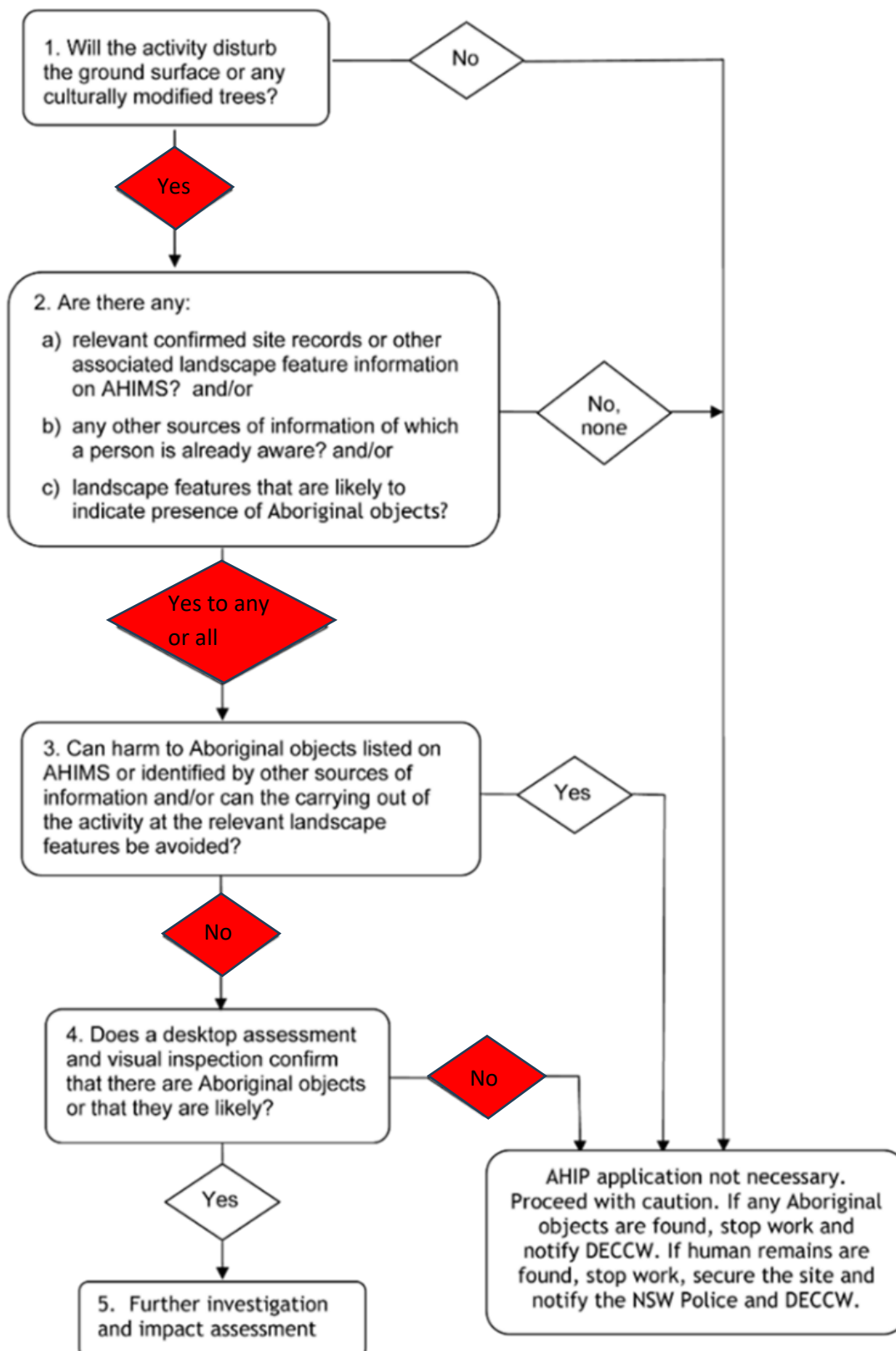
Historic aerial photo 'Narrabri', 1964, sheet number 8837, film 1226, run R2N, frame 5151, key diagram 8837_1964_1970; New South Wales Spatial Services.

Historic aerial photo 'Narrabri', 1972, sheet number 8837, film 2105, run R4, frame 5021, key diagram 8837_1972; New South Wales Spatial Services.

Historic aerial photo 'Narrabri', 1989, sheet number 8837, film 3662, run R5, frame 310, key diagram 8837_1989; New South Wales Spatial Services.

12 Appendix

Appendix A: Flow chart of the due diligence process for the project



Appendix B: AHIMS Search Results

The Appendix overpage is not to be made public

Sites within a 6km Radius of the Study Area

 AHIMS Web Services (AWS)														
Note: This Excel report shows the sites found in AHIMS on the 12/01/2026. If this date is not the same as the original date of the Search Results letter obtained during the Basic Search, then the search results might be different. The PDF version of this report will always coincide with the Basic Search Results letter.														
Site ID	Site name	Datum	Zone	Easting	Northing	Context	Site status	Primary contact	Site features	Site types	Recorders	Reports	Permits	Longitude GDA94
19-3-0008	Kebah;	AGD	55	778499	6639714	Open site Valid			Stone Quarry : - , Artefa Quarry		Brown			149.90
19-3-0078	Bullawa Creek SCA 1	GDA	55	778740	6639794	Open site Valid			Artefact : -		Mr.Craig Trindall			149.90
19-3-0079	Bullawa Creek SCA site GDA		55	777919	6639792	Open site Valid			Grinding Groove : 4		Mr.Craig Trindall			149.89
19-3-0080	Bullawa Creek SCA 3 GDA		55	777920	6639845	Open site Valid			Grinding Groove : 2		Mr.Craig Trindall			149.89
19-3-0081	Bullawa Creek SCA site GDA		55	777921	6639845	Open site Valid			Ochre Quarry : 2		Mr.Craig Trindall			149.89
19-3-0082	Bullawa Creek SCA site GDA		55	777948	6639853	Open site Valid			Artefact : 3		Mr.Craig Trindall			149.89
19-3-0226	Llara Farm CMT1	GDA	55	776212	6647867	Open site Valid			Modified Tree (Carved or Scarred) : -		Mr.Andy Roberts			149.87
19-3-0227	Llara Farm CMT2	GDA	55	776354	6647696	Open site Valid			Modified Tree (Carved or Scarred) : -		Mr.Andy Roberts			149.87
19-3-0228	Llara Farm CMT3	GDA	55	776430	6647545	Open site Valid			Modified Tree (Carved or Scarred) : -		Mr.Andy Roberts			149.87
19-3-0229	Llara Farm CMT4	GDA	55	776442	6647510	Open site Valid			Modified Tree (Carved or Scarred) : -		Mr.Andy Roberts			149.87
19-3-0230	Llara Farm CMT5	GDA	55	776453	6647244	Open site Valid			Modified Tree (Carved or Scarred) : -		Mr.Andy Roberts			149.87
19-3-0231	Llara Farm CMT6	GDA	55	777059	6646413	Open site Valid			Modified Tree (Carved or Scarred) : -		Mr.Andy Roberts			149.88
19-3-0232	Llara Farm CMT7	GDA	55	777576	6646435	Open site Valid			Modified Tree (Carved or Scarred) : -		Mr.Andy Roberts			149.89
19-3-0233	Llara Farm CMT8	GDA	55	777599	6646370	Open site Valid			Modified Tree (Carved or Scarred) : -		Mr.Andy Roberts			149.89

Report generated by AHIMS Web Service on 12/01/2026 for Emily Meadham for the following area at Lat, Long From : -30.4156, 149.7433 - Lat, Long To : -30.2674, 149.9305. Number of Aboriginal sites and Aboriginal objects found is 55

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