Review of Environmental Factors

Sovereign Hills Zone Substation

December 2024

Project No. 794565

Essential Energy

essentialenergy.com.au

Revision History	
Version	**Nature of Revision**
Draft01	Preliminary draft prepared for Essential Energy's Environmental Services peer review.
Draft02	Final draft for Artefact Heritage and Environment internal review
Draft03	Final draft for Essential Energy review
Draft04	Final draft Essential Energy review
Final_V5	Final prepared for Essential Energy determination
Final_V6	Revised to include updated information on geotech, traffic and land use.

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Acronyms and Abbreviations

AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
ADSS	All-dielectric self-supporting. A type of fibre optic cable which is nonconductive, self-supporting and is capable of being erected under tension between supports.
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
ASS	Acid Sulfate Soils
AASS	Actual Acid Sulfate Soils
AEMO	Australian Energy Market Operator
BDAR	Biodiversity Development Assessment Report
CEMP	Construction Environmental Management Plan
Consequence	The outcome of an event expressed qualitatively or quantitatively, being a loss, injury, disadvantage or gain.
dB(A)	Decibels (A) weighted
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Commonwealth)
DPE	Department of Planning and Environment
DP	Deposited Plan
EMF	Electric and Magnetic Fields
Environmental Aspect	Any element of an organisation's activities, products or services that can interact with the environment.
Environmental Impact	Any change in the environment whether adverse or beneficial, wholly or partially resulting from organisation activities, products or services.
EPA	Environment Protection Authority
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Reg	*Environmental Planning and Assessment Regulation 2021*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPIs	Environmental Planning Instruments
ES Act	*Electricity Supply Act 1995*
ESD	Ecologically Sustainable Development
EWP	Elevated Work Platforms
FSC	Field Service Centre (Essential Energy)
FM Act	*Fisheries Management Act 1994*
GHG	Greenhouse Gas

Ha	Hectare
IPC	Independent Planning Commission
kV	Kilovolts
LALC	Local Aboriginal Land Council
Likelihood	A qualitative description of probability or frequency
LEP	Local Environmental Plan
LG Act	*Local Government Act 1993*
LGA	Local Government Area
mG	Milligauss
MVA	Mega Volt Amps
NES	National Environmental Significance
NO_X	Oxides of Nitrogen
NPW Act	*National Parks and Wildlife Act 1974*
PASS	Potential Acid Sulfate Soils
POEO Act	*Protection of the Environment Operations Act 1997*
REF	Review of Environmental Factors
RF Act	*Rural Fires Act 1997*
Roads Act	*Roads Act 1993*
RMS	Roads and Maritime Service
SCADA	Supervisory control and data acquisition. A computer-based system for gathering and analysing real-time data to monitor and control equipment that deals with critical and time-sensitive materials or events.
SEE	Statement of Environmental Effects
SEPP	State Environmental Planning Policy
SHI	State Heritage Inventory
SHR	State Heritage Register
SIS	Species Impact Statement
SWMP	Soil and Water Management Plan
TEC	Threatened Ecological Community
T&I SEPP	*State Environmental Planning Policy (Transport and Infrastructure) 2021*
WM Act	*Water Management Act 2000*

Review of Environmental Factors Approval Form

REF name	Sovereign Hills Zone Substation Project No. 794565
REF prepared by	Clinton Jurd (Artefact Heritage and Environment)
Title	Environment Lead – Artefact Heritage and Environment
Qualifications	Bachelor of Environmental Management and Tourism
Proponent Name	Essential Energy
Proponent Address	8 Buller St Port Macquarie NSW 2444

This Review of Environmental Factors (REF) assesses the potential impacts that may result from the proposed and associated activities as outlined in “Description of the Proposal” section of this report.

Essential Energy is a state-owned corporation and is a determining authority as defined in the *Environmental Planning and Assessment Act 1979* (EP&A Act). The proposal satisfies the definition of an ‘activity’ under the EP&A Act, and as such Essential Energy must assess and consider the environmental impacts of the proposal before determining whether to proceed. This REF has been prepared in accordance with section 5.5 of the EP&A Act and clause 171 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Reg). The EP&A Act requires Essential Energy to examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity. The EP&A Reg sets out environmental factors to be considered in making that assessment. If the activity is considered likely to significantly affect the environment, additional assessment requirements under the EP&A Act would be required.

Section 5.7 of the EP&A Act states that a determining authority shall not carry out an activity, or grant an approval in relation to an activity, that is likely to significantly affect the environment (including critical habitat) or threatened species, populations or ecological communities, or their habitats, unless the determining authority has examined and considered an Environmental Impact Statement or Species Impact Statement in respect of the activity.

The REF has addressed the matters that are required to be considered by Part 5 of the EP&A Act, with the conclusion that if the activity is carried out as described, it is not likely to have a significant effect on the environment (including critical habitat) or threatened species, populations, ecological communities or their habitats, and accordingly an Environmental Impact Statement is not required. The mitigation strategies forming part of the activity are fully considered and discussed in the REF.

The activity was also assessed against the requirements of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). As the proposed activity would not significantly impact on matters of national environmental significance, a referral to the Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEEW) is not required.

The proposed activity is permissible under all relevant state and federal legislation, including the EPBC Act and the *Biodiversity Conservation Act 2016* (NSW).

Under *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&I SEPP) the activity is classified as development for the purpose of an electricity transmission or distribution network undertaken by or on behalf of a public authority and is hence permitted on the land without the requirement for development consent.

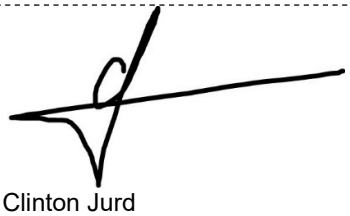
Declaration

The Review of Environmental Factors for the proposed activity has been assessed by Essential Energy, including consideration of the Department of Planning Environment Guidelines for Division 5.1 Assessments, June 2022.

Considering the assessment of the impacts, including sections 1.7 and 5.5 of the *Environmental Planning and Assessment Act 1979* and clause 171 of the *Environmental Planning and Assessment Regulations 2021*, it is concluded that:

- there is not likely to be a significant environmental effect because of the construction, operation and maintenance of the activity and an Environmental Impact Statement is not required; and
- a Species Impact Statement (SIS), or Biodiversity Development Assessment Report (BDAR) is not required.

Site and Assessment Review – I affirm that the information provided within this assessment is accurate to the best of my knowledge, belief, and information.



Clinton Jurd
Environment Lead
Artefact Heritage and Environment
(Author)
Date: 18 December 2024

Nathan Hegerty
Digitally signed by Nathan Hegerty
Date: 2024.12.18 10:45:09 +11'00'

Nathan Hegerty
Environmental Senior Specialist
Essential Energy
(Reviewer)
Date:

The assessment has been reviewed and it is recommended that the Activity may now proceed subject to the implementation of the recommendations and mitigation measures contained in the REF documentation.

Steve Tonkin
Project Manager
Essential Energy
Date:

Steve Tonkin
Digitally signed by Steve Tonkin
Date: 2024.12.18 14:47:48 +11'00'

1. Considering the assessment of the impacts, including sections 1.7 and 5.5 of the *Environmental Planning and Assessment Act* 1979 and clause 171 of the *Environmental Planning and Assessment Regulation* 2021, it is determined that there is not likely to be a significant environmental effect because of the construction, operation and maintenance of the Sovereign Hills 33/11kV Zone Substation. Neither an Environmental Impact Statement (EIS), nor SIS, nor BDAR is required.

2. The Activity may now proceed subject to obtaining and complying with the relevant approvals as identified in the REF and subject to the implementation of the recommendations and mitigation measures contained in the REF documentation.

Brett Hayward
Digitally signed by Brett Hayward
Date: 2024.12.18 15:31:00 +11'00'

Brett Hayward
Environmental Services Manager
Essential Energy
Date:

Executive Summary

Background / Justification

Essential Energy is proposing to design, construct, operate and maintain a new component of the electricity supply network at Thrumster, on the western outskirts of Port Macquarie, New South Wales (NSW). The proposal is required to meet increasing and anticipated electricity demand from the developing Sovereign Hills township.

Consistent with Port Macquarie Hastings Council (PMHC) and NSW Dept of Planning & Environment (DPE) forecasts, the proposal will ultimately deliver over 20MVA of electricity supply to the developing Sovereign Hills satellite township, located approximately 7.5km WSW of the Port Macquarie town centre on the NSW mid-North Coast.

Two 11kV powerlines are the main source of electricity to supply Sovereign Hills from the Clearwater Crescent 33/11kV Zone Substation (ZS) located approximately 6km east of Thrumster or Sovereign Hills. Electricity supply to the area is unacceptably restricted when supply from one of these two 11kV feeders is lost during peak loads. The existing electricity distribution network and surrounding ZS's do not have the capacity to supply anticipated future electricity demand without major electricity network capacity investment.

The proposal, which includes the construction of a new Sovereign Hills ZS (SHZS), two new underground 33kV cables from the nearby TransGrid 132/33kV substation, and a new access road, from the end of Thrumster Street, are the subject of this Review of Environmental Factors (REF). Proposed new 11kV electricity distribution feeder connections, where they will ultimately traverse beyond the new SHZS boundary will be considered as part of a separate REF.

Construction and operation of the new proposal will;

- ensure local electricity supply infrastructure meets the current and future needs of the Sovereign Hills township,
- strengthen Essential Energy's existing electricity network throughout the broader area,
- increase its capacity to support surrounding future electricity connections, and
- allow the connection of many new customers to the Essential Energy network, which ultimately reduces the cost of electricity for all customers and improves reliability.

The Proposal

The proposal includes the construction, operation, and maintenance of a new SHZS, two new underground 33kV cable connections, and a new access road extending from the existing western formed road end of Thrumster Street, just beyond the nearby TransGrid Port Macquarie (Thrumster) 132/33kV Substation (TPMS) to the proposed new SHZS.

The new 33/11kV ZS, will be located within an Essential Energy owned property known as Lot 1, DP 1185319 (34 Thrumster Street, Thrumster), and will include the following elements;

- Two 30/40MVA transformers housed in bunded transformer bays.
- A single combined switchboard and control building with amenities and high voltage switchgear operating at 11kV and 33kV.
- Two auxiliary transformers.
- Underground conduits and cables traversing into the SHZS from the nearby PMTS.
- Underground electricity distribution feeder conduits within the SHZS site.
- Underground earth grid throughout the SHZS.
- Lightning protection masts.
- Benching and levelling with batters and driveways surrounding the SHZS facility within the property boundary.
- Palisade fencing surrounding the SHZS facility, and

- Access road extension construction along Thrumster Street.

Project Alternatives

One option would be to refrain from undertaking any further development of the electricity network in the area. The consequences of Essential Energy doing nothing would be reduced electricity supply reliability and sufficient electricity supply would not be available for Sovereign Hills and the broader developing areas. Essential Energy's network licence obligations dictate that the 'do nothing' option is not a viable alternative to constructing and operating the proposed new SHZS, particularly given the additional broader electricity network benefit it provides.

Two key electricity network development options were assessed to alleviate the recognised electricity supply constraint for the developing Sovereign Hills area. Option 1, the preferred option assessed in this REF establishes a new 33/11kV electricity ZS at Sovereign Hills.

Option 2 proposed to augment the existing Clearwater ZS and the existing 11kV and 33kV electricity supply networks, was not preferred. This was due to excess overall electricity network costs, associated electricity network constraints, and a lack of additional electricity network benefits.

The options evaluation concluded that establishing the SHZS, with short network connections to the nearby TransGrid Substation met expected electricity network load growth, enhanced overall electricity network load capabilities and flexibility, and minimised overall electricity network augmentation cost.

Statutory Planning and Legislation

Clause 2.44 of *State Environmental Planning Policy (Transport and Infrastructure) 2021* (T&I SEPP) applies to electricity transmission and distribution activities undertaken by an energy supply authority. Clause 2.44 states that development for the purpose of a transmission or distribution network may be carried out by or on behalf of an electricity supply authority or public authority without consent on any land, with additional requirements for land reserved under the *National Parks and Wildlife Act 1974*.

As the activity does not require development consent, Essential Energy is the designated determining authority. Additionally, whilst Essential Energy does not require development consent to undertake the proposed activity, it has an obligation under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) to consider the environmental impacts of the activity.

Specifically, Essential Energy has a statutory obligation to examine and take into account, to the fullest extent possible, all matters affecting or likely to affect the environment by reason of this activity. This REF has been prepared to facilitate the determination through consideration of the relevant factors specified in section 5.5 of the EP&A Act, clause 171 of the *Environmental Planning and Assessment Regulation 2021* (EP&A Reg) and Department of Planning and Environment Guidelines for Division 5.1 Assessment (DPE Guideline).

Environmental Impact Assessment

This REF has been prepared in accordance with Part 5, Division 5.1 of the EP&A Act to assess the environmental impacts and provide appropriate mitigation measures associated with the construction, operation and maintenance of the proposed activity. The REF has examined and considered to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposal.

Several potential environmental impacts associated with the proposal have been avoided or reduced to acceptable levels during the design development and assessment process. However, the proposal may still result in some impacts including air quality (dust), noise, vegetation, traffic, waste generation, and visual amenity during construction and operation, as outlined in Section 6. Management and mitigation measures to alleviate these impacts have been developed as part of this REF and would be implemented during construction and operation of the proposal.

Considering the assessment of the impacts detailed in this REF, it is concluded that the proposed activity is not likely to have a significant impact on the environment. On balance, the proposal is justified based on supporting the development of Sovereign Hills and strengthening Essential Energy's electricity network in the broader area, whilst minimising potential environmental impacts.

1. Introduction

1.1 The Proposal

This Review of Environmental Factors (REF) assesses the potential environmental impacts associated with the proposed construction, operation, and maintenance of the new Sovereign Hills 33/11 kilovolt (kV) Zone Substation (ZS) at Thrumster, including:

- two new underground 33kV cable connections,
- and a new access road extending from the existing western formed road end of Thrumster Street, just beyond the nearby TransGrid Port Macquarie (Thrumster) 132/33kV Substation (TPMS) to the proposed new Sovereign Hills ZS (SHZS).

The significance of impacts of the proposal have been determined and appropriate mitigation measures recommended.

The proposal involves the construction of a new 33/11kV zone substation, the Sovereign Hills Zone Substation (SHZS), within an Essential Energy owned property known as Lot 1, DP 1185319 (34 Thrumster Street, Thrumster) (the proposal site).

The proposal will include the following main elements;

- Two 30/40MVA transformers housed in bunded transformer bays.
- A single combined switchboard and control building with amenities and high voltage switchgear operating at 11kV and 33kV.
- Underground conduits and cables traversing into the proposal site from the nearby PMTS.
- Lightning protection masts.
- Fencing, driveways, landscaping, and an access road extension along an unformed section of Thrumster Street.

1.2 Context and Justification of the Proposal

Essential Energy is proposing to design, construct, operate and maintain a new component of the electricity supply network at Thrumster, on the western outskirts of Port Macquarie, New South Wales (NSW). The proposal will deliver electricity supply to the developing new Sovereign Hills satellite township and support surrounding development.

Port Macquarie Hastings Council (PMHC) released its urban growth strategy in 2017 (PMHC 2018) detailing three key development areas within the Port Macquarie Hastings Council area:

- Area 13 – Sovereign Hills
- Area 14 – Lake Cathie/Bonny Hills
- Area 15 – Camden Haven

The largest, Sovereign Hills, located approximately 7.5 kilometres (km) west of Port Macquarie is predicted to grow to include residential, commercial, and industrial development with an expected electricity demand of over 20MVA. Sovereign Hills is forecast to have 7,000 residents by 2036, with connection of multiple spot loads including a 3MVA data centre load and 4MVA sewer plant load, and between 300 to 400 annual new residential customer connections from FY23/24. This development or growth rate is consistent with population and residential dwelling estimates from both PMHC and NSW Dept of Planning & Environment (DPE).

Presently two 11kV powerlines supply Sovereign Hills from the Clearwater Crescent 33/11kV Zone Substation, located approximately 6km east of Sovereign Hills. Electricity supply to the area is unacceptably restricted when the supply from one of these two 11kV powerlines is lost, particularly during peak loads. Furthermore, the existing electricity distribution network and surrounding ZSs do not have the capacity to supply the forecast future electricity demand without major electricity network capacity investment.

Construction and operation of the new SHZS will ensure the local electricity infrastructure meets the current and future needs of Sovereign Hills and will also strengthen Essential Energy’s existing

electricity network in the broader area, as well as increase its capacity, which will help support future electricity connections. Development of the SHZS will allow many new customers to connect to Essential Energy's electricity network, which will ultimately contribute to reducing the cost of electricity prices for all customers and increasing reliability.

1.3 Network Investment Criteria

Network asset investment by Essential Energy is generally required to:

- Meet Essential Energy's duty of care;
- Connect customers to the supply network; and
- Provide a satisfactory standard of supply to customers.

The overall performance of the network is driven by the reliability of individual network components and the redundancy provided by the network to enable maintenance of supply at times when critical parts of the network are out of service (due to maintenance or repair requirements). To maintain acceptable standards of customer service it is necessary to ensure:

- Infrastructure performance (reliability) is maintained at acceptable levels; and
- The network design provides adequate security (redundancy).

The reliability performance of equipment and infrastructure is managed through maintenance and replacement of that infrastructure. For Essential Energy, the decision to replace infrastructure is based on an assessment of equipment condition and consideration of the strategic replacement needs of the network.

1.4 Proposal Objectives

The primary objective of the project is to design, construct, operate and maintain a 33/11kV ZS, which will supply the developing Sovereign Hills development area, while also strengthening Essential Energy's existing electricity network in the broader area. Secondary objectives associated with the project are to:

- Maximise social and economic benefits; and
- Minimise the environmental and social impacts.

1.5 Proposal Site

The proposed new SHZS will be located within relatively disturbed and previously cleared property within the suburb of Thrumster, which is located approximately 7.5km west of Port Macquarie, NSW (refer **Figures 1-1 and 1-2**). The approximately 8500m^2 proposal site, recognised as Lot 1, DP 1185319 (34 Thrumster Street, Thrumster) is located at the northeastern extent of a larger Lot 3, DP12293093, adjacent an unformed section of Thrumster Street which continues approximately 900m west to the Pacific Highway and approximately 100 east to the end of the formed road section of Thrumster Street. The formed road section of Thrumster Street features residential development on various sized properties, the nearest boundary of which is approximately 60m east-northeast of the proposal site. The PMTS is located adjoining to the south at the western end of the formed road section of Thrumster Street. The formed road section of Thrumster Street continues straight from near the driveway access into the PMTS approximately 400m east to then veer south to continue approximately 750m to intersect with John Oxley Drive. **Figure 1-3** shows the location of the proposal site relative to Thrumster Street and the surrounding larger Lot 3, DP12293093 (College Drive, Thrumster). The proposal site will be accessed via a westerly access road extension along the Thrumster Street road reserve beyond the existing formed road section of the Street (refer **Figure 1-3**).

The proposal site and the proposed access road along Thrumster Street are within the NSW North Coast bioregion and the North Coast Macleay Hastings IBRA (interim bioregional assessment) subregion. The lot is currently zoned RE1 Public Recreation according to the *Port Macquarie-Hastings Local Environmental Plan 2011* (PMH LEP).

Located at the northeastern extent of the Sovereign Hills Estate residential subdivision development area, future regional sporting fields are proposed to adjoin the proposal site to the south, beyond which exists St Joseph's Regional College and the Sovereign Place Town Centre that is surrounded by recent residential development, with further residential development proposed. Recent residential development is also located approximately 300m west of the proposal

site with an area of bushland between.

The proposal site features native and non-native trees, grasses, forbs vegetation with a well-defined corridor of existing native vegetation along and east to west axis through the central portion of the subject site. Review of the NSW DPE State Vegetation Map: 'NSW Extant PCT vC1.1.M1' PCT map identified the area surrounding and parts of the proposal site, are mapped as Plant Community Type (PCT) 4047 Northern Swamp Mahogany-Bottlebrush Swamp Forest, PCT 4004 Northern *Melaleuca quinquenervia* Swamp Forest with PCT 4006 Northern Paperbark-Swamp Mahogany Saw-sedge Forest (refer **Section 6.5** Flora and Fauna and **Appendix C**). Based on historical aerial images of the proposal site and surrounds, the proposal site was cleared between 1979 and 1981 and remained clear through to at least 1991. The vegetation present on the proposal site today either side of a track that arcs through the site appears or is likely to be regrowth albeit contiguous with the surrounding plant communities. This apparently raised or benched track appears to have been constructed around the time the site was cleared prior to 1979. Again, based on historical aerial images, the unformed Thrumster Street road alignment that continues past the proposal site and onto the Pacific Highway was cleared prior to 1969 of large trees and is maintained with grasses and shrubs only, and excludes treed vegetation. The road is traversed by an overhead (OH) powerline. Establishment of the PMTS, including various OH powerlines that traverse south and north of the proposal site occurred prior to 1979.

Plates 1-1 through 1-4 below show the existing site condition and **Plate 1-5** is an historical aerial image of the site in 1989.

The nearest existing sensitive receivers include existing residential properties located along Thrumster Street from approximately 200m northeast. The PMTS is the nearest developed property. Partridge Creek, a Strahler Third Order ephemeral stream passes approximately 50m west of the western extent of the proposal site, commencing approximately 5.7km to the southwest and continuing approximately 5km northeast to the Hastings River. Site surface stormwater drainage presently flows to Partridge Creek and is proposed to continue to do so via dedicated on-site drainage discharging to the adjacent Thrumster Street road corridor.

The proposal site is within the RL (relative level) 47.5m AHD (Australian Height Datum) Inner Horizontal Surface Limited area of Port Macquarie Airport (PMHC 2013). Structures within or associated with the proposal will not encroach into the Airport's Inner Horizontal Surface Limited area

1.6 Study Area

A thorough inspection of the proposal site and broader study areas was conducted on foot by the REF author on 6 October 2023 (see **Plates 1-1 through 1-4**), with subsequent inspection by Essential Energy Environmental Services staff on 10 October 2023. The study area includes the proposal site, surrounding cleared and forest areas including the Thrumster Street road reserve, and the developed urban areas along Thrumster to the east and east-northeast. Sensitive environmental areas within the broader region include waterways, wetlands, biodiversity, Aboriginal and non-Aboriginal heritage, and other environmental values that form part of the surrounding landscape.

1.7 Purpose of REF

The purpose of this REF is to document the assessment of potential environmental impacts of the proposal and identify if there are likely to be any significant environmental impacts. It informs Essential Energy's determination of the proposal under Part 5, Division 5.1 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

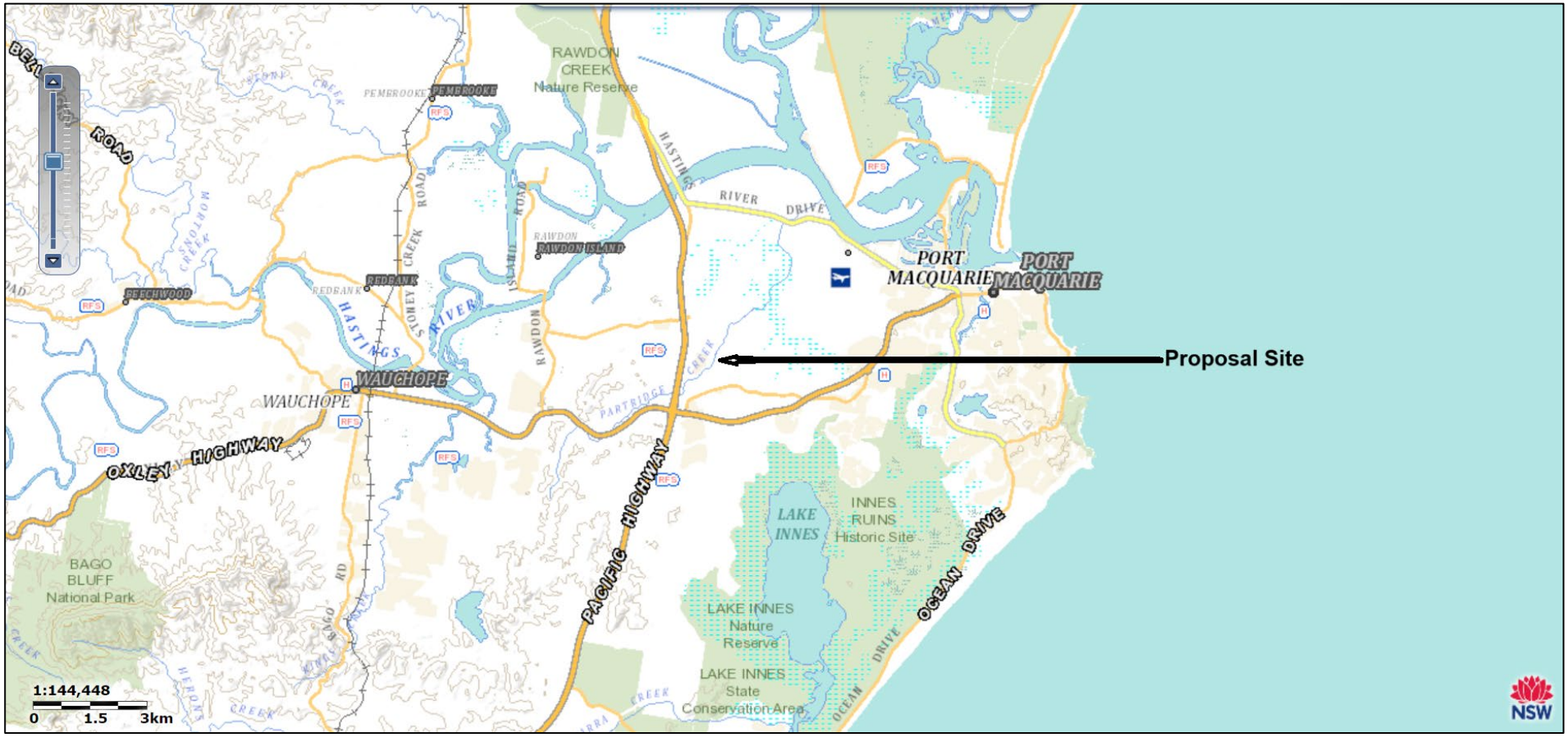


Figure 1-1: Proposal site location in the regional context.

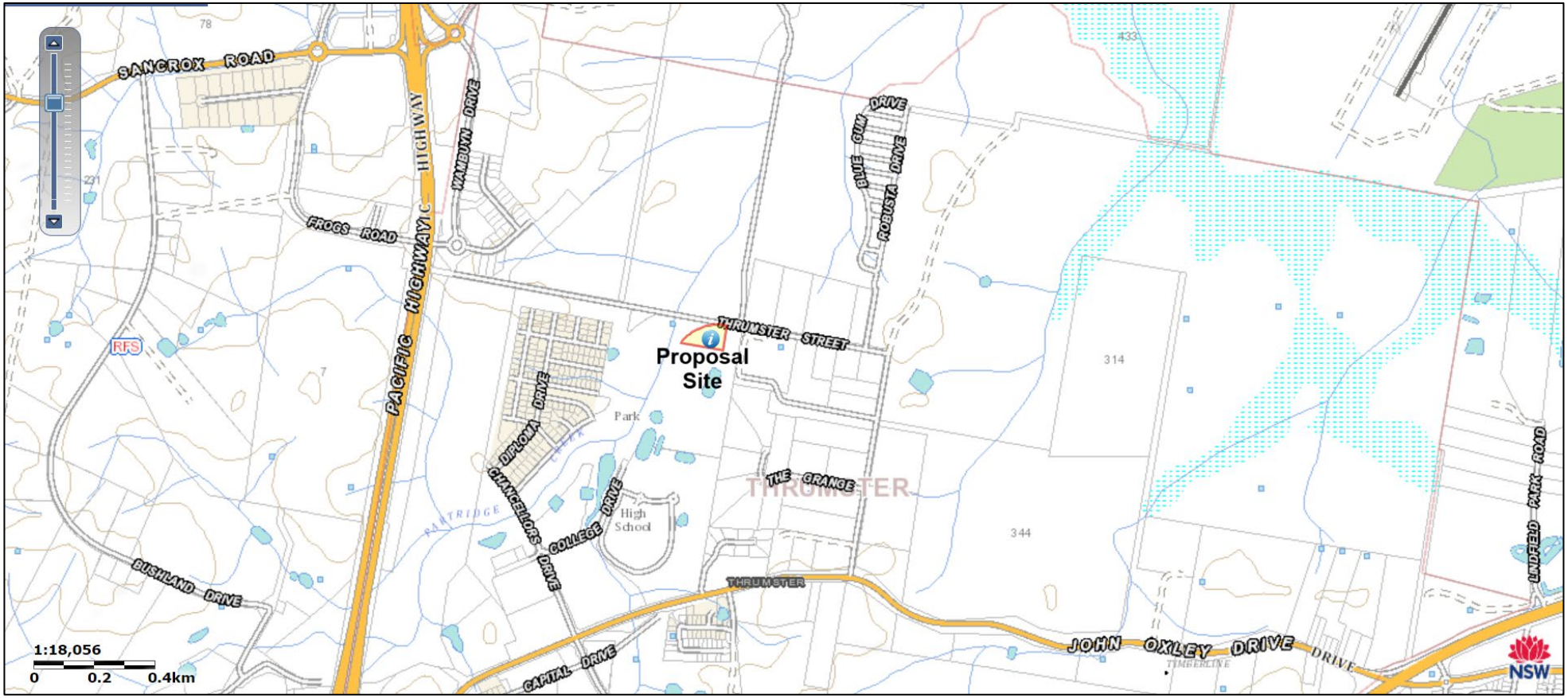


Figure 1-2: Proposal site [at centre] in the local context.

Figure 1-3: Proposal site Lot 1, DP1185319 adjacent to the south of the unformed section of Thrumster Street, the surrounding partially previously cleared property to the south, west, and east and the Port Macquarie TransGrid Substation east of this.

Plate 1-1 – Panoramic view NE through east to SE across the proposal site (approximately at centre) from approximately near the western proposal site property boundary. The existing raised track that arcs through the proposal site is visible from right (continuing to College Drive) to centre (see next Plate).

Plate 1-2 – Panoramic view WNW through NW to NNW across the proposal site from approximately near the eastern proposal site property boundary. The existing raised track that arcs through the SHZS property is visible from right of centre continuing to centre.

Plate 1-3 – Panoramic view east through south to west; showing the Port Macquarie TransGrid 132/33kV Substation at left, the proposal site from the centre to right of centre (featuring limited vegetation), and the unformed Thrumster Street road corridor from far left, through the foreground and continuing at right (west).

Plate 1-4 – Panoramic view SW (showing PMTS driveway entry at left) through west (along and to the western formed road end of Thrumster Street right of centre) to NW across a residential property opposite the PMTS. Thrumster Street is proposed to be extended beyond its existing formed road end to the new Sovereign Hills Zone Substation proposal site (see previous Plate).

Plate 1-5 – Historical aerial image of the proposal site and surrounds in 1989 (DCS NSW 2023)

2. Description of the Proposal

2.1 Scope of Works

The proposal involves the construction of the new 33/11kV SHZS, an access road extension of Thrumster Street to the proposal site, and two new underground 33kV cable connections from the PMTS. The SHZS will be constructed on a proposed 4500m^2 substation pad within an Essential Energy owned 8430m^2 property known as Lot 1, DP 1185319 (34 Thrumster Street, Thrumster). A raised or benched and battered access road will be constructed to continue west along the unformed road alignment of Thrumster Street from its existing formed road end to the proposed northern driveway entry into the proposal site. The access road will provide safe and efficient access to the site. With future development of the proposed regional sporting fields to the south of the proposal site, alternative access to the site may ultimately also be available from a continuation of College Drive, which currently terminates approximately 500m south-southwest of the proposal site.

The SHZS proposal will include the following elements;

- Benching and batter works extending almost out to the proposal site property boundaries and beyond at the driveway entry point from the Thrumster Street road corridor.
- Benching and batter road construction works along part of the unformed road section of Thrumster Street from its existing western end to the proposal site.
- Two 30/40MVA transformers housed on bunded transformer bays.
- A single combined switchboard and control building with amenities and high voltage switchgear operating at 11kV and 33kV.
- Two auxiliary transformers.
- Underground conduits and cables traversing into the SHZS from the nearby PMTS.
- Underground electricity distribution feeder conduits within the SHZS site.
- Underground earth grid throughout the SHZS.
- Lightning protection masts.
- Driveways exiting the proposal site to the west and north.
- Security fencing and landscaping that is sympathetic to the operation of a substation.

Preliminary site arrangement and civil design is shown in **Figures 2-1** and **2-2** respectively, and is included as **Appendix A**.

2.1.1 Civil works staging

Site benching and batters, conduits for cable installation, and establishment of an access road to the proposal site will require civil works to be carried out within the proposal site and along an unformed road section of Thrumster Street, from its western formed road end near adjacent the existing PMTS and continuing west to the proposal site. Limited access for proposal site benching and batter works will be required within the surrounding Lot 3, DP1293093 from east through south to west of the proposal site.

Civil works will initially involve establishment of a raised or benched and battered access road along Thrumster Street to the proposal site and benching to level the proposal site, form batters extending out to the proposal site boundaries and a driveway for the proposal site access from Thrumster Street. The civil works will clear the entire 0.85-hectare substation proposal site and between a 0.2-0.3-hectare area along the unformed road section of Thrumster Street. Following site benching and batter works, a construction compound or laydown area will be established and maintained within the proposal site through to completion and commissioning. Limited use of Thrumster Street beyond its existing western formed road end adjacent Lot 3, DP1293093 to the east, south and west for materials laydown etc may be required and will be negotiated prior as such. Civil work will be completed by a suitably qualified contractor.

2.2 Design Criteria

The proposed new 33/11kV ZS will be primarily constructed to service the Sovereign Hills area and will importantly also increase electricity reliability in the broader region. The design has been developed to meet the following criteria:

- Meet the design life requirements.
- Be cost effective when assessed on a life cycle cost basis.
- Be capable of being constructed cost-efficiently and within time constraints.
- Provide durability and reliability of the intended function.
- Minimise potential environmental impacts.

2.3 Building Code of Australia

Development by the Crown under section 6.28 of the EP&A Act is required to comply with the technical provisions of the State's building laws, in particular the BCA.

Essential Energy's design standards for buildings and substations meet the requirements of the BCA where appropriate; and the relevant Australian standards (such as AS2067 2008 Substations and high voltage installations exceeding 1kV alternating current).

2.3.1 Utilities

Utilities and services (i.e., water supply, sewer, electricity supply) for the proposal will be constructed as part of civil works for the SHZS development. These services will continue from the existing western formed road end of Thrumster Street to the new SHZS site along Thrumster Street as part of the access road construction. Where reasonably feasible utilities and services will be located within their typical asset allocation alignment within the road reserve to reduce the potential need for future asset relocation.

2.3.2 Fencing and signage

Security of substations is of paramount importance due to the extreme dangers which energised electrical equipment can pose to untrained individuals. Adequate security fencing will be provided. The fence will be designed in accordance with Essential Energy's zone substation security fencing requirements.

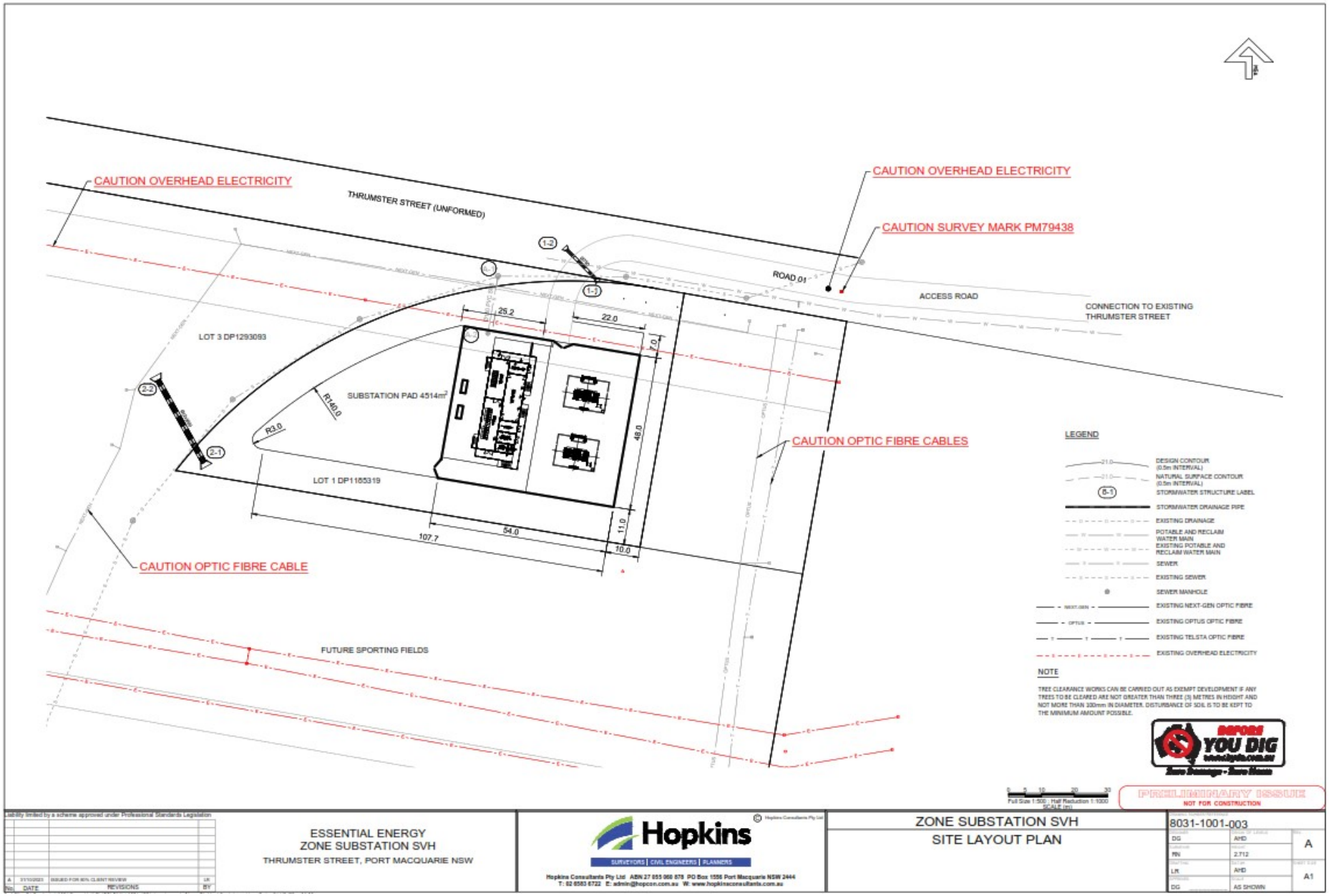


Figure 2-1: Concept Site Layout Plan

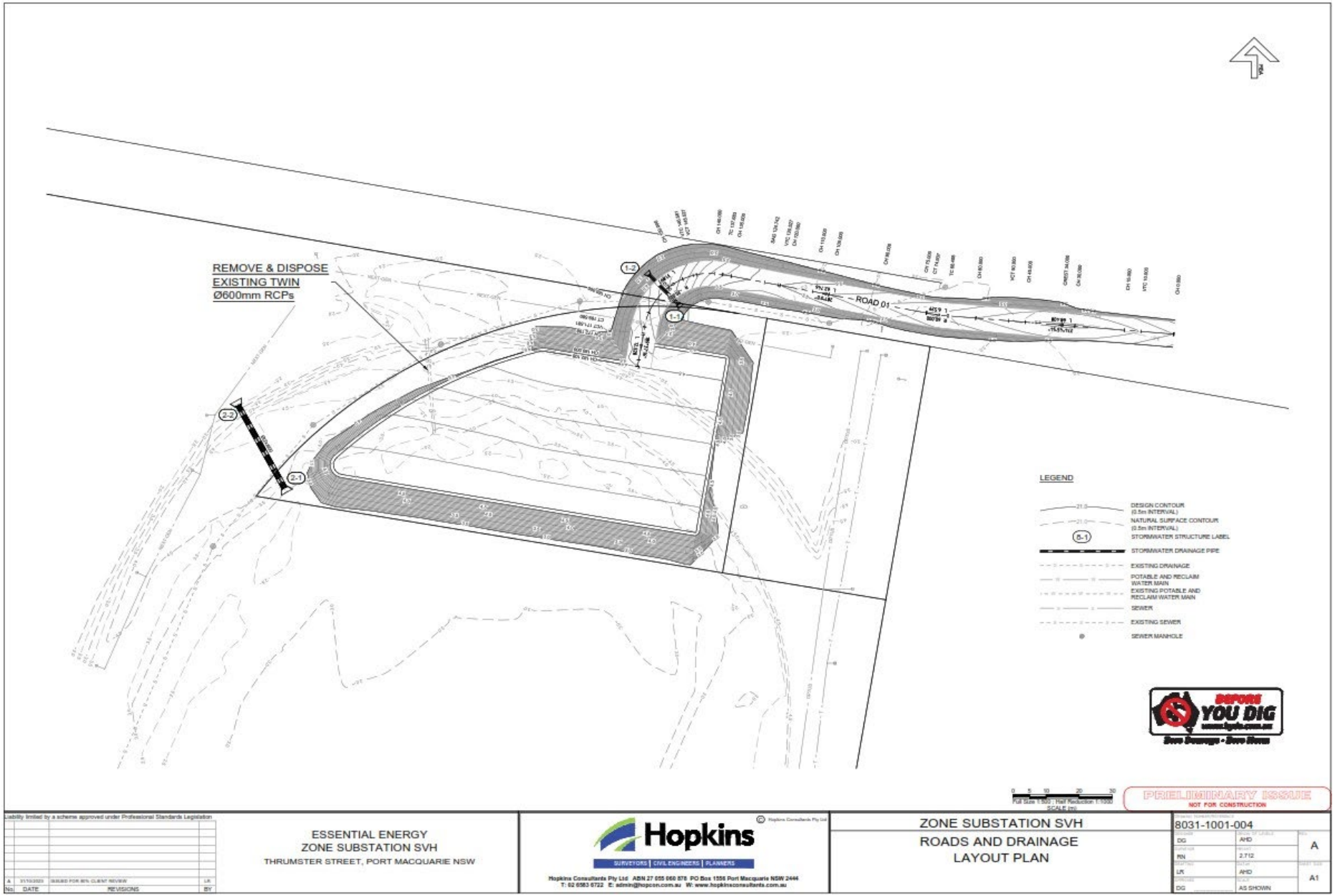


Figure 2-2: Concept Civil Design Plan

2.3.3 Access and parking

Car parking will be provided within the substation yard. Given that the substation will be an unmanned facility, this will provide for more than adequate off-street parking.

2.4 Construction Activities

2.4.1 Timing and work hours

Construction work is expected to commence in the latter half of 2024, and continue for approximately 9-12 months, weather dependant.

With the nearest sensitive residential receptor being approximately 200m from the proposal site, works creating an audible noise at the nearest receptor will be restricted to standard construction hours; i.e. 7am and 6pm Monday to Friday, 8am to 1pm Saturday and no works on Sunday. On occasions, works outside these hours may be undertaken where the following requirements are met:

- Neighbours (and other sensitive receivers) adjacent to the works or the local council or the NSW Environment Protection Authority (EPA) have been notified; and
- The works are justified on the basis that they are emergency works, or, because of supply security network outages or construction limitations, it is deemed that the works can only be achieved outside these hours.

2.4.2 Resources and equipment

The following equipment is likely to be used on site to complete the work:

- Excavator
- Backhoe
- Elevated work platforms (EWP)
- Trucks
- Concrete trucks
- Cranes
- Grader
- Roller
- Bulldozer
- Concrete pump truck
- Forklift
- Under borers
- Bobcat
- Water truck
- Trencher
- Cable trucks
- Light vehicles.

2.4.3 Impact mitigation

The mitigation measures as detailed in **Section 6** form part of the proposed activity and will be implemented, as required, as part of the construction and operational phases.

2.5 Operation and Maintenance Requirements

Once the project is constructed, periodic maintenance will be required. Regular inspections of the infrastructure will be undertaken to help identify defects and hazards such as damaged components and vandalism. The site will not accommodate staff or contractors on a permanent basis. Periodic collection of waste may be required.

Likely maintenance activities include:

- Vegetation maintenance around perimeter of new ZS
- General landscape maintenance within the new ZS site
- Regular inspection and maintenance of ZS equipment.

3. Consultation

3.1 Overview

Community consultation defines the processes we use to seek views or provide information about projects. The term consultation can describe processes ranging from simply delivering information to residents, community information displays, or holding meetings with community representatives designed to actively seek feedback from local communities into a particular project.

The population generally is more aware than ever of their social, environmental, and economic needs. They want to know about what is planned for their area and how it would impact on them. Incorporating community consultation as a key business practice is both a necessary and a desirable path for Essential Energy to take. It must be undertaken in good faith and be transparent in all activities.

Essential Energy has consulted with TransGrid, and Port Macquarie Hastings Council regarding the proposed works. The proposal site is located some distance from nearby residential areas and places used by the community, direct views of the proposal site are not enjoyed from the nearest residential and community areas or otherwise, and there is limited potential for the works to impact upon the broader community. Consultation with the boarder community is not proposed for this activity. Construction notification will be provided as appropriate prior and during the works.

3.2 Consultation and its Requirements under the T&I SEPP 2021

Under the EP&A Act, Essential Energy is the determining authority for certain developments defined under the T&I SEPP as being permissible without consent. While the nature of work being undertaken does not require council consent, Division 1 of the T&I SEPP does provide consultation requirements with the local council where works are anticipated to impact upon council infrastructure, local heritage items, flood liable land and certain land within the coastal zone. In addition, consultation may be required with the State Emergency Service (flood liable land) and other specified public authorities in certain circumstances.

The proposed construction activity for the new SHZS will be limited to the designated proposal site, an unformed road section of Thrumster Street, and the routes of the new underground 33kV cables from the PMTS continuing through the adjacent surrounding Lot 3, DP1293093 to the east into the proposal site. Easement negotiations with TransGrid and the owner of Lot 3, DP1293093 is ongoing. Initial proposal site benching and batter works may require limited and minimal access into the surrounding adjacent Lot 3, DP1293093, which will be formally negotiated with the relevant property owner. The proposal will include its own site drainage to undeveloped parts of Thrumster Street which is part of the Partridge Creek catchment. Ultimate future development of Thrumster Street may result in local stormwater infrastructure development, into which the proposal site drainage may connect. The proposal site will require connection to water supply and sewage systems from the western end of Thrumster Street, however given the SHZS is unmanned, it will not result in any substantial impact to or load on either. Due to the relative isolation of the SHZS beyond the end of an unformed road and within an undeveloped area, the potential for disruption to local roads for delivery of large plant and equipment will be nil or minor and will not involve disruption of pedestrian or vehicle traffic.

The proposal site is not located within a mapped area of local heritage, according to Port Macquarie Hastings LEP. Consultation with the local council is therefore not triggered under clause 2.11 of the T&I SEPP.

The proposal site is not located on flood liable land or located within the coastal zone. Consultation with the local council is therefore not triggered under clause 2.12 or 2.14, and consultation with State Emergency Services (SES) is not triggered under clause 2.13 of the T&I SEPP.

The proposal site is not located on land, or adjacent to land, that would trigger consultation with other specified public authorities under clause 2.15 of the T&I SEPP.

In addition to consultation requirements, additional notification and approval requirements are outlined in Table 5-2.

4. Project Alternatives

4.1 Do Nothing (Maintain Current Supply Infrastructure)

One option would be to refrain from undertaking any further development of the network in the area. The consequences of Essential Energy doing nothing would be that, as years passed, supply interruptions would occur more frequently and affect more people, and there is insufficient capacity within the existing electricity supply network to meet the electricity demand created by the developing Sovereign Hills development area and broader developing urban area.

Due to Essential Energy's network licence obligations, the 'do nothing' option is not a viable alternative to development and operation of the proposed new SHZS, which will support development of the Sovereign Hills development area and the broader PMHC urban growth strategy in 2017 (PMHC 2018).

4.2 Network Development Options

Two key electricity network development options were assessed to alleviate the recognised electricity supply constraint for the developing Sovereign Hills area. Option 1, the preferred option assessed in this REF, establishes a new 33/11kV electricity ZS at Sovereign Hills. Option 2, which proposed to augment the existing Clearwater ZS and the existing 11kV and 33kV electricity networks, was not preferred. This was due to excess overall electricity network costs, associated electricity network constraints, and a lack of additional electricity network benefits.

The options evaluation concluded that establishing the SHZS, with short network connections to the nearby TransGrid Substation met expected electricity network load growth, enhanced overall electricity network load capabilities and flexibility, and minimised overall electricity network augmentation cost.

5. Environmental Legislation

The following section addresses the regulatory and statutory context of the proposed activity including its definition, land use permissibility, and compliance with the relevant environmental planning instruments (EPIs).

5.1 Environmental Planning and Assessment Act, 1979 (EP&A Act)

The *EP&A Act* is the primary piece of legislation regulating land use planning in NSW. It provides the framework for the development of state and local planning instruments which, through their hierarchy, determine the statutory process for environmental impact assessment. Under the *EP&A Act* there are two distinct processes, which are:

- Part 4 - 'development' proposals which require consent, including state significant development; and
- Part 5, which regulates 'activities' and requires an approval by a determining authority (e.g. Essential Energy). Part 5 also includes an assessment pathway for state significant infrastructure.

The proposal satisfies the definition of an activity under Part 5 of the *EP&A Act* given the proposal:

- May be carried out without development consent;
- Is not exempt development; and
- Would be carried out by a determining authority or requires the approval of a determining authority.

A determining authority, for the purposes of this activity, is defined in Part 5 of the *EP&A Act* to include, but not be limited to, a state-owned corporation within the meaning of the *State Owned Corporations Act 1989*. Essential Energy is listed as a state-owned corporation, and would therefore be the determining authority for the activity covered by this REF.

In accordance with state and local EPIs (described below), this REF has been prepared under Part 5, Division 5.1 of the *EP&A Act* to assess the possible environmental outcomes of the proposed activity. In determining the proposal and degree of impact, Essential Energy is required to consider section 5.5 of the *EP&A Act,* clause 171 of the *EP&A Reg* and the DPE Guideline which are summarised in **Section 9**.

In accordance with clause 171(4) of the *EP&A Reg*, Essential Energy is required to publish this REF on the NSW planning portal, as the capital value of the substation will exceed $5 million, prior to the activity commencing.

5.2 Environmental Planning Instruments

EPIs regulate the permissibility to undertake an activity and the type of assessment process that is required. EPI is the generic term used to describe state environmental planning policies, regional environmental plans[1] and local environmental plans (LEPs). EPIs that apply to this development are outlined below.

5.2.1 State Environmental Planning Policies

5.2.1.1 State Environmental Planning Policy (Transport and Infrastructure) 2021

State Environmental Planning Policy (Transport and Infrastructure) 2021 (T&I SEPP) consolidates and updates the planning process for new infrastructure. Subject to certain exemptions the T&I SEPP allows development for the purpose of an electricity transmission or distribution network to be carried out by or on behalf of an electricity supply authority or public authority without consent on any land.

Exemptions to this broad (on any land) application include developments which require Part 4 approval under *State Environmental Planning Policy (Planning Systems) 2021* (Planning Systems SEPP) or activities triggering designated development assessment under *State Environmental*

[1] The *Environmental Planning and Assessment Amendment Act 2008 No 36* repealed the power to make regional environmental plans. Regional environmental plans still in force are now considered to be state environmental planning policies.

Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP).

The proposal site is not located on land identified as coastal wetlands or littoral rainforest on the *Coastal Wetlands and Littoral Rainforests Area Map*, according to Resilience and Hazard SEPP.

The proposed activity falls within the scope of the *T&I SEPP* as being permissible without development consent.

Consultation requirements under the *T&I SEPP* are addressed in **Section 3.3**, whilst notification provisions are detailed in **Table 5-2**.

5.2.2 Local Environmental Plans (LEP)

LEPs are developed by councils (they become law only after Ministerial approval) and guide planning decisions for local government areas. According to the DPE, LEPs, through zoning and development controls, allow councils to regulate the ways in which land is used. Council LEPs also list heritage items that are of local heritage significance.

The application of the *T&I SEPP* overrides the need to consider zoning controls, as developments covered by the *T&I SEPP* are permissible on *any land* without consent. However, the *T&I SEPP* provides consultation and notification provisions where activities are likely to substantially impact upon council-related infrastructure, or items of local heritage significance.

5.3 Key Legislation

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

The Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) requires the approval of the Commonwealth Minister for the Environment for actions that may have a significant impact on matters of national environmental significance (NES). Approval from the Commonwealth is in addition to any approvals under NSW legislation.

The *EPBC Act* lists nine matters of NES which must be addressed when assessing the impacts of a project. An assessment of how the project may impact on matters of NES is provided in **Table 5-1**.

Table 5-1: Matters of national environmental significance

Matter of national environmental significance	Impact
World heritage properties	There are no world heritage properties proximate to the proposed development, or that would potentially be affected by the proposal.
National heritage places	There are no national heritage places proximate to the proposed development, or that would potentially be affected by the proposal.
Wetlands of international importance	There are no Ramsar wetlands proximate to the proposed development, and the proposal is not likely to have a significant impact on the ecological character of a Ramsar wetland.
Commonwealth listed threatened species and ecological communities	The proposal is not expected to have any significant impact on threatened species, populations or ecological communities listed within Commonwealth (or State) legislation (refer **Section 6.5**).
Great Barrier Reef Marine Park	The proposal would not result in any impacts to the Great Barrier Reef Marine Park.
Commonwealth listed migratory species	The proposal is not expected to have an impact on listed migratory species (refer **Section 6.5**).
Nuclear action	The proposal would not result in any nuclear action, nor would the activity require any nuclear action to be undertaken.
Commonwealth marine areas	There are no Commonwealth marine areas proximate to the proposed development, or that would potentially be affected by the proposal.
Impacts on water resources resulting from large coal mining and coal seam gas developments	The proposal is not related to any large coal mining or coal seam gas developments. The project would not impact on water resources.

Given that the proposal would not significantly impact on matters of NES, and would not be carried out on Commonwealth land, the *EPBC Act* is not triggered and approval from the Commonwealth Minister for the Environment and Water is not required.

5.3.2 Biodiversity Conservation Act 2016

The *Biodiversity Conservation Act 2016* (BC Act) provides the process for listing threatened species, threatened ecological communities, and areas of outstanding biodiversity value, and details the process for assessing impacts on those matters.

Section 1.7 of the *EP&A Act* requires that assessment of an activity must consider its impact on threatened species, threatened populations, and threatened ecological communities or their habitats in accordance with Part 7 of the *BC Act*. The assessment for determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats, referred to in section 7.3 of the *BC Act*, determines whether the proposed works are likely to have a significant impact. If a significant impact is determined, a species impact statement (SIS) is required, or if the proponent so elects, a Biodiversity Development Assessment Report (BDAR) can be prepared.

The proposal site features native and non-native vegetation including trees, grasses, and forbs and a well-defined native vegetation corridor along an east to west axis through the centre of the site. The site is not located within a declared area of outstanding biodiversity value and the proposal was assessed as being unlikely to have a significant impact on any threatened species, populations or threatened ecological communities within the subject site (refer to **Section 6.5** and **Appendix C**).

5.3.3 Biosecurity Act 2015

The *Biosecurity Act 2015* (Biosecurity Act) provides for the prevention, elimination, minimisation and management of biosecurity risks posed by biosecurity matter, dealing with biosecurity matter, carriers and potential carriers, and other activities that involve biosecurity matter, carriers or potential carriers. Section 22 of the *Biosecurity Act* requires that any person who deals with biosecurity matter, or a carrier, and who knows, or ought reasonably to know, the biosecurity risk posed or likely to be posed by the biosecurity matter, carrier or dealing, has a biosecurity duty to ensure that, so far as is reasonably practicable, the biosecurity risk is prevented, eliminated, or minimised. This obligation is referred to elsewhere within the *Biosecurity Act* as the “general biosecurity duty.

Given the excavation and disturbance of surface soils associated with the proposed activity, Essential Energy has a general biosecurity duty to ensure the biosecurity risks posed by the potential for the introduction of weed species are prevented, eliminated, or minimised.

5.3.4 Electricity Supply Act, 1995 (ES Act)

The *Electricity Supply Act 1995* (ES Act) establishes a comprehensive wholesale and retail market in electricity and regulates the network operations, wholesale trading, and electricity supply in the retail market. The *ES Act* confers special powers on Essential Energy in respect of development and maintenance of electricity infrastructure and sets out the licencing regime. It allows Essential Energy to trim and remove trees, carry out works on public roads, and acquire land.

The *ES Act* also requires that no works (other than routine repairs or maintenance works) may be carried out unless 40 days’ notice has been given to the local council to make a submission in relation to the proposal. Any submission must be considered by Essential Energy.

5.3.5 Heritage Act, 1977 (Heritage Act)

The *Heritage Act 1977* (Heritage Act) provides for the protection of heritage items of local and state significance. Such items may include places, buildings, works, relics, moveable objects, or precincts with historical, scientific, cultural, or aesthetic value to the state. Where works are likely to impact upon an item listed on the State Heritage Inventory (SHI), approval may be required under two sections of the *Heritage Act*:

- Section 60 approval relating to impacts on items listed on the SHI; and
- Section 140 approval requiring an excavation permit for activities with potential to excavate or disturb a relic.

As described in **Section 6.7.2** there is no foreseeable likelihood that an item listed on the SHI would be impacted by the proposal, therefore further assessment and a permit from the Department is not required. Further discussion of potential impacts and measures to minimise

impacts to items of local heritage significance is provided in **Section 6.7**.

5.3.6 Local Government Act 1993 (LG Act)

The *Local Government Act 1993* (LG Act) implements a commitment made under section 51 of the NSW Constitution Act 1902 that requires the continuance of local government. The *LG Act* provides the legislative framework in which local councils operate and encourages local participation in the affairs of local government.

Whilst the central focus of the *LG Act* is about the governance of local councils and the participation of the local community in its affairs, the *LG Act* also includes provisions for approval of certain works. In areas outside of the operation of the Sydney and Hunter Water Boards, local councils have the responsibility for the regulation of water supply, sewerage' and stormwater drainage work.

According to section 68 of the *LG Act*, approval from local council is required for water supply work, sewerage work, and stormwater drainage work. Water supply work includes the extension of any pipes or fittings of any water services communicating or intended to communicate, directly or indirectly, with any water main of a council. Sewerage work includes not only works related to the sewer system, but also septic tank disposal systems.

As the proposal will require construction and extension of sewerage and water supply service pipes or fittings or fixtures communicating or intended to communicate, directly or indirectly, with a sewer and water supply of a council, it is likely a section 68 approval will be required from the local council.

5.3.7 Local Land Services Act, 2013 (LLS Act)

The *Local Land Services Act 2013* (LLS Act) established Local Land Services, a government agency with the responsibility for providing advice on biosecurity, natural resources, and agricultural advisory services in NSW. The *LLS Act* includes provisions for the regulation of native vegetation including the approval of certain activities.

Under the *LLS Act*, approval is required from the Minister for the Environment or delegate to clear native vegetation (exemptions apply). Exemptions include, but are not limited to, urban areas, electricity line maintenance and Part 5 activities under the *EP&A Act*.

The *LLS Act* is administered by the various local land services under delegated authority by the Minister for the Environment.

Given that the proposal will be assessed under Part 5 of the *EP&A Act*, the provisions relating to the *LLS Act* are not applicable.

5.3.8 National Parks and Wildlife Act, 1974 (NPW Act)

The *National Parks and Wildlife Act 1974* (NPW Act) provides for the management of all national parks, historic sites, nature reserves, reserves, Aboriginal areas, and state game reserves. It also provides for the protection and care of native flora and fauna, and Aboriginal places and objects throughout NSW. Under the *NPW Act* it is an offence, without authorisation, to:

- Harm an Aboriginal object or place without consent;
- Pick or harm any plant or animal that is protected or is a threatened species, population, or ecological community; or
- Damage any critical habitat, or habitat of a threatened species, an endangered population or an endangered ecological community or reserved land.

When an activity is likely to harm an Aboriginal object or place, approval under section 90 is required.

The *NPW Act* also serves to direct the management and protection of reserved land[2]. In relation to utility installations, the Minister for the Environment may grant easements or rights of way through reserved land for the conveyance or transmission of electricity.

The proposal site is not located on reserved land. Approval under the *NPW Act* is not required in respect of the proposed activity.

[2] Land being a national park, historic site, state conservation area, regional park, karst conservation reserve, nature reserve or an Aboriginal area.

As described in **Section 6.6,** based on the design, and mitigation measures, the proposal is not likely to impact upon Aboriginal objects.

5.3.9 Protection of the Environment Operations Act, 1997 (POEO Act)

The *Protection of the Environment Operations Act 1997* (POEO Act) provides a framework for the licencing of activities that have potential to result in pollution of the environment. The *POEO Act* is administered by NSW EPA. An environment protection licence is not required for the proposed activities as they do not fall within Schedule 1 of the *POEO Act*; however, the following restrictions apply:

- The proposal must not pollute waters;
- Waste from the works must not be wilfully or negligently disposed of in a manner that harms or is likely to harm the environment;
- Waste must not be transported to a place that cannot lawfully be used as a waste facility for that waste;
- There must be no litter in or on a public place or an open private place caused by workers; and
- Any environmental incident that involves actual or potential harm to the health or safety of human beings or to ecosystems must be reported to the Environment Protection Authority (EPA).

During construction, there is the potential for discharge to surface waters from excavation and trenching activities. Various management strategies are available to Essential Energy for the discharge to surface waters, including discharging water over grassed or well vegetated areas away from waterways, or the use of filter bags in urban environments.

5.3.10 Roads Act 1993 (Roads Act)

The *Roads Act 1993* (Roads Act) provides for the ownership and management of public roads, and requires the consent of the appropriate roads authority for various works in respect of certain public roads.

Section 138 of the *Roads Act* requires the consent of the appropriate roads authority for various works in respect of public roads and classified roads. Under Schedule 2 (5) (1) of the *Roads Act* Essential Energy is exempt from obtaining approval for works on or over an unclassified road other than a Crown road. However, works that require a connection to or crossing of a classified[3] road must be approved by Transport for NSW (TfNSW).

The proposed activity will be limited to private property. No work within, on, or over a classified road is required, therefore there is no requirement for a Section 138 approval from TfNSW.

5.3.11 Water Act, 1912 (Water Act)

Under the *Water Act 1912*, for any temporary or permanent works not defined in a gazetted water sharing plan under the *Water Management Act 2000*, a licence or permit is required to:

- Extract water from a stream, river or water course via a pump or other work; or
- Extract groundwater via any type of bore, well, spear point or groundwater interception scheme (including dewatering).

It is unlikely that the shallow excavation and trenching works (to a maximum of approximately 1.2m depth) will require dewatering during construction of the proposal.

5.3.12 Water Management Act, 2000 (WM Act)

The *Water Management Act 2000* (WM Act) governs the issue of new water licences and the trade of water licences and allocations for those water sources (rivers, lakes, and groundwater) in NSW where water sharing plans have commenced. Under the *WM Act*, should water need to be extracted from a surface water source, defined in gazetted water sharing plan, then three licence/approvals must be obtained including:

- An Access Licence to obtain access to a share of the water source;
- A Works Approval to obtain permission to install and use the works for water supply, drainage

[3] Classified Roads include main roads, highways, freeways, a controlled access road, a secondary road, a tourist road, a tollway, a transitway and State work.

or flood mitigation work. For groundwater extraction or dewatering, an Aquifer Interference Approval may be required. A Controlled Activity Approval may be required for a works location in, on, or under waterfront land; and

- A Water Use Approval to obtain permission for how the water would be used.

Under the *WM Act*, a controlled activity means:

a) the erection of a building or the carrying out of a work (within the meaning of the *Environmental Planning and Assessment Act 1979),* or

b) the removal of material (whether or not extractive material) or vegetation from land, whether by way of excavation or otherwise, or

c) the deposition of material (whether or not extractive material) on land, whether by way of landfill operations or otherwise, or

d) the carrying out of any other activity that affects the quantity or flow of water in a water source.

The *WM Act* defines an aquifer interference activity as involving any of the following:

a) the penetration of an aquifer,

b) the interference with water in an aquifer,

c) the obstruction of the flow of water in an aquifer,

d) the taking of water from an aquifer in the course of carrying out mining, or any other activity prescribed by the regulations,

e) the disposal of water taken from an aquifer as referred to in paragraph.

The proposal would not include works in locations that would trigger the above licences/approvals (including wetlands). In addition, Essential Energy, a public authority, is exempt from section 91E (1) of the *WM Act* in relation to all controlled activities that it carries out in, on, or under waterfront land.

5.4 Summary of Licences, Permits, Approvals and Notifications

Specific approvals required for the construction, maintenance and operation of the proposal are outlined in **Table 5-2**.

Table 5-2: Summary of licences, permits, approvals and notifications

Legislation	Authority	Requirement
State Environmental Planning Policy (Transport and Infrastructure) 2021	Local Council and occupiers adjoining land	21 days notification required for works involving new or existing substations. Essential Energy's Design Services section will provide these notifications.
Electricity Supply Act 1995	Local Council	40 days notice of the proposed works must be given to the local Council. Essential Energy's Design Services section will provide these notifications.
Local Government Act 1993	Local Council	Section 68 approval will be required for construction and extension of water supply and any sewerage service pipes or fittings or fixtures communicating or intended to communicate, directly or indirectly, with any water supply and sewer of a council.

6. Environmental Assessment

6.1 Air Quality and Greenhouse Gases

6.1.1 Existing environment

The proposal site is situated on previously cleared and developed rural land within a developing urban area. The main air quality influences on the existing environment would be associated with urban use and development including transport emissions and construction activity, including dust generation. Transport exhaust emissions from vehicles utilising nearby roads including Thrumster Street to the east and the expanding urban development of Sovereign Hills Estate occurring along and off John Oxley Drive to the south, southwest and west of the proposal site also contribute to local air quality in the vicinity of the proposal site.

The closest existing sensitive receivers are residential properties located from approximately 200m northeast, within an existing varying lot size residential area along Thrumster Street. The next nearest potentially sensitive receivers are residential properties that are part of the Sovereign Hills Estate located approximately 300m to the west and St Joseph's Regional College located approximately 600m to the south of the proposal site. The PMTS is the nearest existing development in the vicinity of the proposal site.

6.1.2 Assessment of impact

6.1.2.1 Air quality during construction

It is expected that during excavation and site benching works there would be minor amounts of dust generated from the disturbance of soil, and wind erosion of short-term exposed stockpiles.

There will be minimal exhaust emissions from vehicles. Exhaust emissions from construction equipment are likely to include nitrogen oxides (NOx), carbon monoxide (CO), sulphur oxides (SO2), hydrocarbons, and total suspended particulates. All vehicles will be fitted with approved exhaust systems to maintain vehicle exhaust emissions within accepted standards.

Works will be predominantly limited to the proposal site itself and along the unformed section of Thrumster Street, with some works to initially bench and batter the site required to be undertaken from the Thrumster Street and the surround Lot 3. If impacts to air quality do occur during construction, they will be very minor in intensity and scope over the construction period. It is unlikely that there will be an odour impact. Any impacts on air quality will be short-term and localised.

6.1.2.2 Air quality during operation

Once operational, the ZS will have negligible impacts on air quality. All Essential Energy's assets are subject to regular maintenance and monitoring to ensure all equipment is operating effectively. Capped surfaces, gardening and landscaping will ensure no dust is generated during the lifetime of the substation.

6.1.3 Environmental mitigation measures

Appropriate dust minimisation measures will be implemented as required, including:

- Any potential dust-borne materials transported to and from the activity site will be always covered during transportation
- Any temporary stockpiles of surplus excavated material will be covered or wet down during dry and windy conditions
- All vehicles and machinery will be well maintained according to manufacturer requirements to ensure emissions are kept within acceptable limits.

6.1.4 Conclusion

The proposal is not anticipated to result in substantial or uncontrollable dust or exhaust emissions in the area during construction or operation. Any air quality impacts would be short-term and minor during construction or future maintenance. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered low.

6.2 Geology and Soil

6.2.1 Existing environment

The proposal site is within the Thrumster (th) Residual Landscape that features undulating to rolling rises and low hills, on mafic metasediments and sediments, with varying relief from 10–50m, elevations from 10 – 60 m, and slopes 3 – 10%. Thrumster (th) Residual Landscape traditionally features very deep, well drained Red Ferrosols (Krasnozems), with imperfectly drained Mottled Brown Kurosols (Lateritic and Brown Podzolic Soils) on lower slopes. Thrumster (th) Residual Landscape land & soil attributes include deep soils, low wet bearing strength, localised stoniness, localised seasonal waterlogging, strong acidity, high soil fertility, productive arable land. **Figure 6-1** illustrates the soil landscapes relative to the proposal site.

According to a geotechnical investigation undertaken by Regional Geotechnical Solutions (RGS, 2023), the proposal site is located on a low-lying floodplain that has been modified by a fill embankment that traverses the site from west to east. Current surface elevations across the site range from approximately RL 4.5m on top of the fill embankment to approximately RL 2.5m on the natural slopes in the south. Surface slopes range from approximately 25 - 30˚ on the fill embankment batters to approximately 2 -4 degrees on the natural slope (RGS, 2023).

The site has been modified by a fill embankment up to 3m in height. Details of the works are not known but are assumed to have comprised placement of clay fill from the Sovereign Hills Estate. The fill embankment traverses east across the proposed building area and is currently being used as an access track. The embankment is vegetated with grass and small trees and had an overall batter angle of 30 degrees (RGS, 2023).

The materials encountered during the geotechnical investigation (RGS, 2023) are summarised in **Table 6-1**

Table 6-1: Summary of geotechnical units

Unit	Material	Material Description
Unit 1A	Topsoil / Fill	Sandy SILT, low plasticity, dark grey, trace grass roots
Unit 1B	Fill Clay	Sandy CLAY to Silty CLAY, medium to high plasticity, pale grey/white/red/orange, stiff to very stiff, trace gravel
Unit 2	Topsoil	Sandy Clayey SILT to Clayey SILT, dark grey/dark brown, trace grass roots
Unit 3A	Alluvial (Firm)	Silty CLAY, medium to high plasticity, grey/pale brown with pale brown/grey mottling, firm
Unit 3B	Alluvial (Stiff)	Sandy CLAY to Silty CLAY to CLAY, medium to high plasticity, pale brown/pale grey/grey, stiff

According to the *Port Macquarie-Hastings Local Environmental Plan 2011* (PMH LEP), potential acid sulfate soils (PASS) are mapped as occurring directly adjacent or encroaching into the proposal site along its western and northern boundaries. **Figure 6-2** illustrates the potential acid sulfate relative to the proposal site.

6.2.2 Assessment of impact

The proposed works will involve site disturbance through excavations, vegetation removal, construction access, additional benching works and general construction activities associated with the construction of the substation. These activities have the potential to impact on soil stability and erosion potential within the site. However, the extent of these impacts is likely to be minimal as works will be restricted to the ZS site and access route from Thrumster Street. The proposed activity is expected to have a low impact on soils and geology in the area.

Estimated cut and fill volumes, provided by Hopkins (2023) for the bench and construction access road are shown below in **Table 6-2**

Table 6-2: Estimated cut and fill volumes

Aspect	Quantity (m^3)
(Cut) Unsuitable material to dispose off-site	-6498
(Fill) GROSS Material to import for Bulk Earthworks (inc pavement)	15139
(Cut) Reuseable material	-2188
(Fill) Deductions for pavement	1754
(Fill) NET Material to import	13384

Based on the RGS (2023) report, the topsoil and topsoil fill are unsuitable for re-use as engineered fill. As such, an excavation depth to approximately RL2.2m will be sufficient to expose the underlying materials for compaction and provide a suitable subgrade for bulk earthworks. 12D modelling estimates that approximately 8,686m^3 of material is to be excavated with 2,188m^3 of reusable clay fill material under the racetrack. Thus, approximately 6498$m^3$of unsuitable topsoil material is to be excavated. RGS (2023) suggested a density of 1.6 tonnes/m^3 of this material to use in earthworks calculations (Hopkins, 2023).

Based on PMH LEP mapping, although unlikely, it is possible that PASS may be encountered along the northern boundary of the ZS lot, and potentially the edge of the proposed access road.

Mitigation measures proposed to manage erosion and sedimentation are outlined in **Section 6.2.3**. Water quality impacts are discussed in **Section 6.3.2**, air quality impacts are discussed in **Section 6.1.2**, and contamination impacts are discussed in **Section 6.8.2**.

6.2.3 Environmental mitigation measures

The following mitigation measures will be employed to manage erosion and sedimentation:

- Risks associated with sediment and erosion will be managed in accordance with The Blue Book – Managing Urban Stormwater: Soils and Construction (Landcom 2004)
- Disturbance to soil will be minimised and disturbed areas will be stabilised as soon as practicable following construction activities
- Essential Energy's CEOP8064 Management of Excavated Material; Guideline for Construction Sites will be consulted to determine the most appropriate beneficial reuse or disposal method for any surplus excavated materials
- Any excavated material along the northern boundary of the ZS lot and edge of access road will be examined for properties that indicate the likely presence of potential or actual acid sulfate soil (e.g. saturation, blue-grey colouring, odour of hydrogen sulfide gas [strong smell of rotten eggs]). If acid sulfate soil encountered, it will be managed in accordance with the acid sulfate management plan as described in Essential Energy's HSE Manual: Land Use (CECM 1000.76) or the development of a site-specific management plan.

6.2.4 Conclusion

The proposal is not anticipated to have any adverse impacts on the soils and geology of the environment. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered low. Further potential impacts to water quality are discussed in the following section.

6.3 Water Quality and Hydrology

6.3.1 Existing environment

The nearest waterway and catchment for the area is Partridge Creek, a Strahler Third Order ephemeral waterway that passes approximately 50m west of the proposal site, commencing approximately 5.7km to the southwest and continuing approximately 5km northeast to the Hastings River (refer **Figure 1-2** and **6-1**). Current site drainage likely follows informal overland flow paths to drain to Partridge Creek from the northern side of the raised or benched track that arcs through the proposal site, or south to the inside of this arced track.

According to the ecological impact assessment for the activity (Appendix C), Partridge Creek is

listed under the *Fisheries Management Act* 1994 (*FM Act*) as Key Fish Habitat, though being ephemeral it is likely limited in providing aquatic habitat where it passes west of the proposal site. It does provide the catchment area for on-site drainage from the proposal site, however the activity is not anticipated to impact the waterway due to proposed implementation of effective erosion and sediment controls and other appropriate pollution prevention measures during construction and operation. **Figure 6-2** provides an illustration of waterways in the vicinity of the proposal site and **Appendix A** provides a stormwater drainage catchment plan and erosion and sediment controls proposed during construction.

6.3.2 Assessment of impact

The following activities have the potential to impact on water quality during the construction and operation of the project:

- Earthworks, including benching and excavations
- Concreting works
- Fuel or oil leaks from construction and maintenance equipment.

These activities have the potential to affect the water quality in the area. In consideration of the small, isolated area of disturbance and location away from the receiving waterways, any potential impacts to surface water flows are likely be negligible. Similarly, the proposal is not expected to have an impact on the Partridge Creek ephemeral waterway.

Regarding groundwater, it is unlikely that excavation and trenching works will result in interaction with any aquifer. Groundwater inflows were not observed within the boreholes undertaken as part of the geotechnical investigation (RGS, 2023).

The construction of the proposal, while maintaining the upper relative level of the proposal site and marginally expanding this area, will not cause impediments to surface water flows. It is therefore expected that there would be no impact on local hydrological conditions.

6.3.3 Environmental mitigation measures

The following mitigation measures will be applied:

- Control measures will be implemented to manage risks associated with the handling of fuel through using spill trays when undertaking in field re-fuelling
- Disturbed areas will be managed in accordance with the requirements of *The Blue Book* to minimise potential impacts to waterways. Sediment fencing and other erosion and sediment pollution controls will be installed and maintained where required at and downslope of disturbed areas, and areas of disturbance or impact would be minimised where practicable.

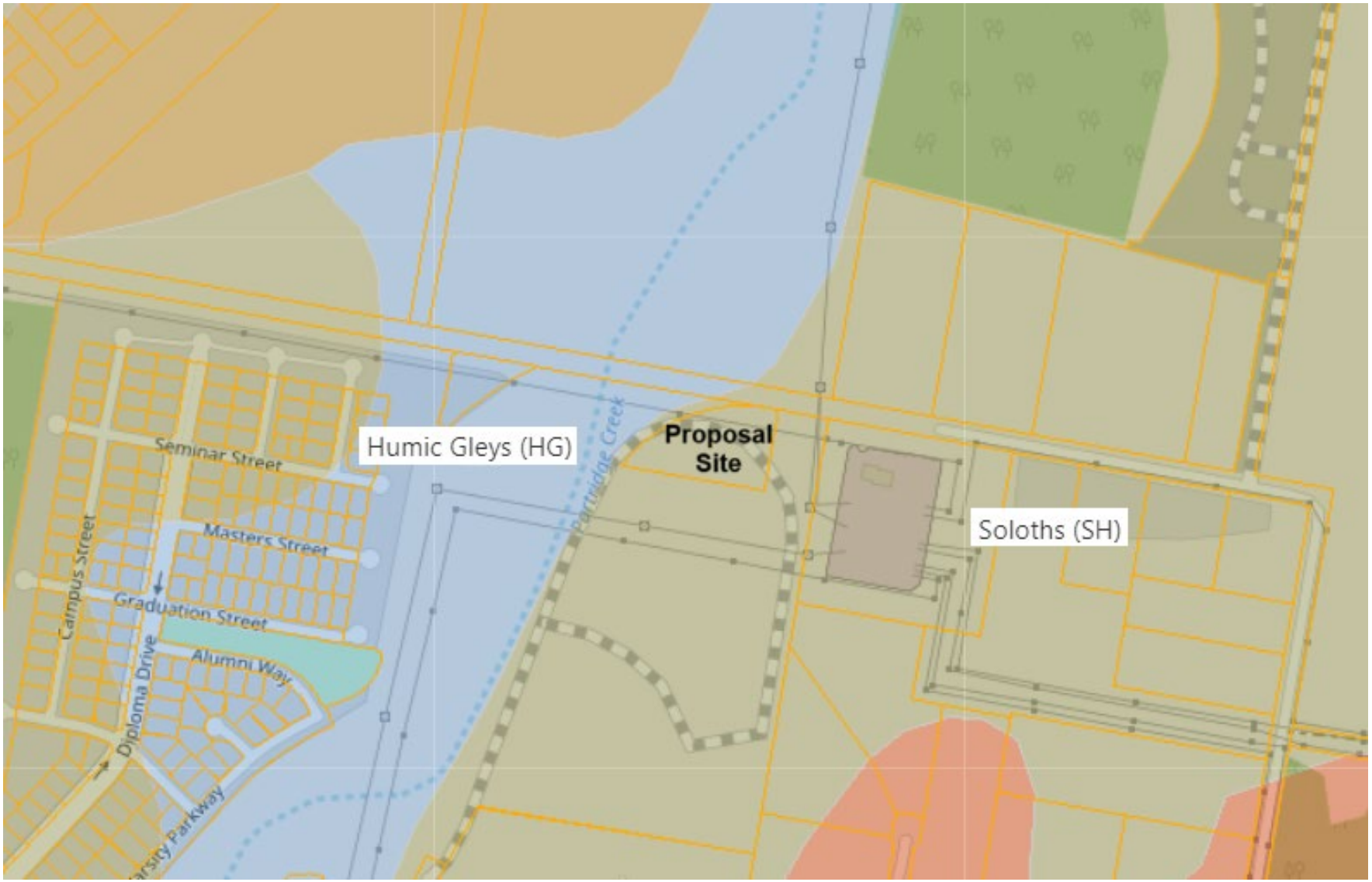


Figure 6-1: Soil landscapes relative to the proposal site with Partridge Creek flowing south to north immediately west of the proposal site.

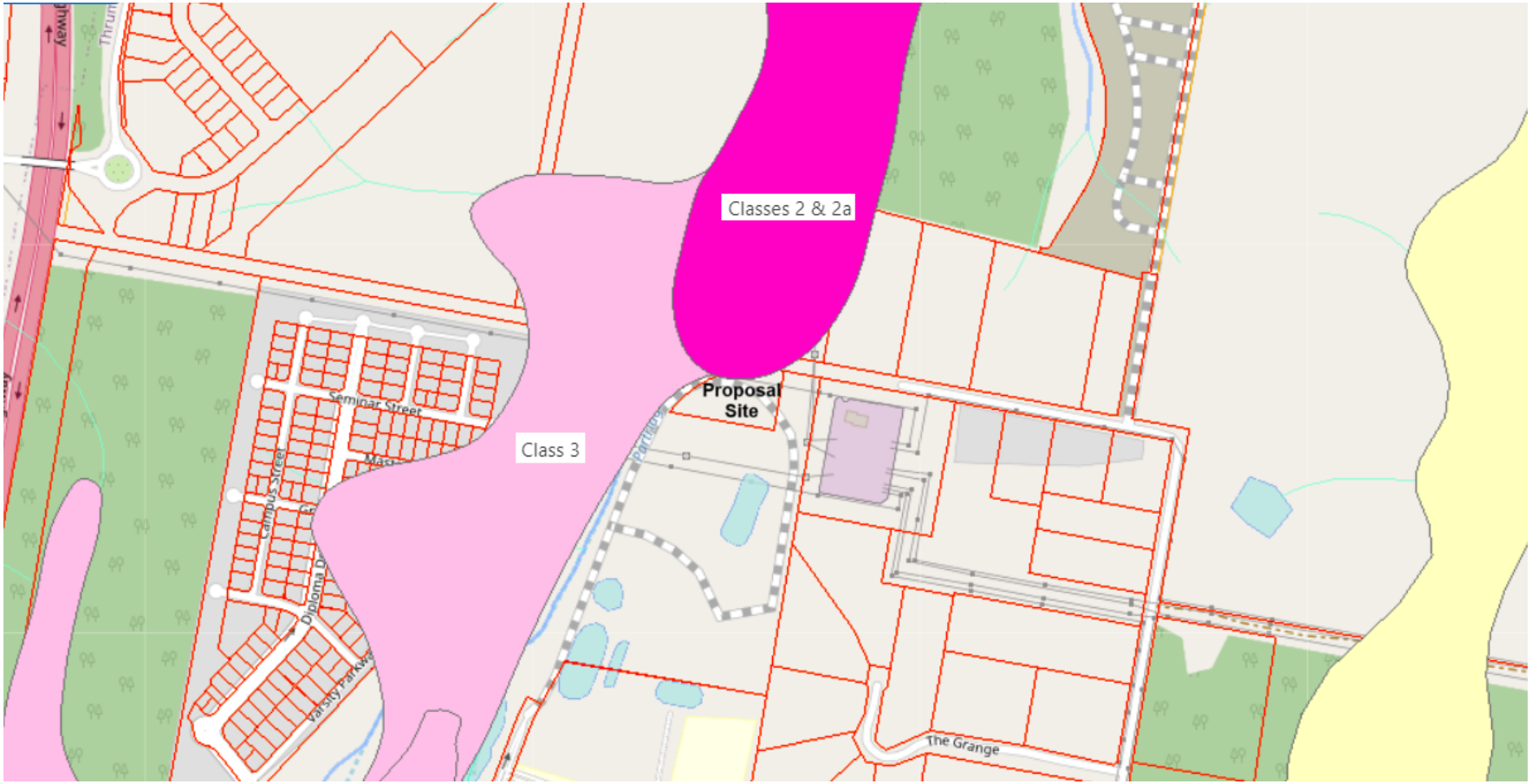


Figure 6-2: Acid sulfate soils mapped adjacent to the west and encroaching into the northern extent of the proposal site

- Any water collected in excavations and trenches during rainfall and surface water ingress should be pumped to a grassed area on-site (where a suitable area is available) to allow for infiltration, reused for dust suppression, or pumped to stormwater using a sediment filter sock. All options should be conducted in a manner that does not result in turbid water entering the stormwater system or nearby waterway
- The extent of the proposal site will be benched to the current general maximum relative level of the site to minimise the risk to the site from flood, noting the proposal site is not within flood liable land.

6.3.4 Conclusion

The proposal is not anticipated to have any impact upon the water quality or hydrological conditions in the area. Any impacts that might occur would be short-term and minor and would occur during construction and maintenance. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered low.

6.4 Noise and Vibration

6.4.1 Existing environment

The closest existing sensitive receivers are residential properties located approximately 200m northeast of the proposal site, within an existing residential area along Thrumster Street. The nearest other residences within a recent residential development area known as College Rise, are located beyond an area of bushland 300m to the west of the proposal site. Regional sporting fields are proposed to be constructed immediately to the south of the proposal site, with an educational facility already existing beyond this, 500m south of the proposal site. The main noise influences on the existing environment include road traffic noise throughout the developing urban area from commercial and domestic noise sources. The area surrounding the proposal site would be characterised as a low to medium urban noise environment.

6.4.2 Assessment of impact

Construction noise

Noise impacts during construction may potentially disturb sensitive receivers in proximity to the proposal site, the nearest being private residences at 200m to the northeast and east-northeast. The main sources of noise during the construction phase will be equipment needed for site works and the transportation and installation of electrical equipment. The following activities are likely to be the main sources of construction noise impacts:

- Site preparation and benching
- Vehicles and trucks transporting construction materials to and from the site
- Set up and movement of construction vehicles and equipment
- Alteration of traffic movements on surrounding roads.

Construction vehicles will use the local road network to access the proposal site. Given the duration of the works generally limited to standard construction hours, nearby surrounding land use, the relatively isolated nature of the proposal site, the nature of existing traffic movements, and relatively low intensity construction methods, it is anticipated that construction activities will not substantially increase ambient noise levels in the area.

Operational noise

The proposal will include the installation of a new building housing high voltage switchboards, and two outdoor 33/11kV transformers. Noise from the 33/11kV transformers has been conservatively estimated at 75dB(A) (worst case scenario with fans and pumps in operation).

Based upon the land use type of the local area, a background noise level of 30dB(A) has conservatively been adopted. As noted above, the nearest residential property to the proposal site is approximately 200m away.

To determine the potential sound power level or ‘noise’ from the substation at the nearest sensitive receiver the following formula can be applied as per the EPA 2013:

SPL=SWL-20log10r-8, where:

- **SPL** is sound pressure level in dB(A),
- **SWL** is sound power level (noise source) in dB(A),
- **r** is the distance from the source to the measuring point.

Based on this calculation, the estimated 75Db(A) noise at the transformer source will be attenuated to a noise level of approximately 21dB(A) at the receiving properties 200m away. Given the isolated nature of the proposal site or buffer distance to the nearest potentially sensitive receiver, the actual attenuation will in effect be greater. This noise level is under the noise goal for the surrounding land use.

6.4.3 Environmental mitigation measures

In considering the isolated nature of the proposed substation site location, being at least 200m from the nearest sensitive residential receiver, audible work hours of between 7am and 6pm Monday to Friday and 8am to 1pm Saturday will apply. On occasions works outside these hours may be undertaken where that work is not likely to be heard at the nearest sensitive receptor or based where the following requirements are met:

- The nearest neighbours (and other sensitive receivers) to the works or the local council or the NSW Environment Protection Authority (EPA) have been notified; and
- Where the works are required to take place in the vicinity of private access ways or driveways, consultation with individual residents would be undertaken to advise residents of the planned timing of the out-of-hours works.

All plant and equipment will be operated and maintained in accordance with the manufacturer's specifications. Any noise complaint will be investigated with additional control measures put in place if required.

6.4.4 Conclusion

The proposal will have acoustic, and vibration impacts during construction and operation. The acoustic and vibration impacts during the construction phase will be short to medium term and moderate, whilst operational noise generated by the proposal will be negligible and unlikely to impact on the nearest sensitive receivers.

Given the mitigation measures outlined in this assessment, the potential noise impacts can be effectively managed, and the overall environmental risk is considered low to moderate.

6.5 Flora and Fauna

6.5.1 Ecological impact assessment

An ecological impact assessment was commissioned to detail the ecology of the proposal site and assess the impacts from the proposal on native vegetation, threatened species, populations, or communities under the *EPBC Act*, *BC Act*, and *FM Act*. The ecological impact assessment is included as Appendix C and summarised below.

Landscape context and existing environment

The proposal site is within the NSW North Coast bioregion and the North Coast Macleay Hastings IBRA subregion, with a Strahler Third Order waterway, Partridge Creek located adjacent approximately 50m west of the site.

The ecological impact assessment commissioned for the proposal found the proposal site features native and non-native vegetation including trees, grasses, and forbs. A well-defined corridor of existing native vegetation follows an east west axis across the centre of the site. Vegetation along the proposed site access route within the unformed Thrumster Street road corridor is connected to a larger adjoining remnant vegetation patch to the north. Vegetation across the proposal site and to the south has been impacted through prior landscape modification works, with limited areas of native shrub and grass regeneration and several prevalent weed species.

State Vegetation Mapping

The 'NSW Extant PCT vC1.1.M1' PCT map sourced from the NSW SEED website provided the baseline for determining the PCTs potentially occurring on the proposal site and access road to be impacted (see **Figure 6-3**). Whilst no plant community types (PCTs) are mapped on the Substation proposal site, the vegetation that is present is likely contiguous with adjacent mapped vegetation. PCT 4047 (Northern Swamp Mahogany-Bottlebrush Swamp Forest) is mapped as present along

the proposed Thrumster Street access road corridor along what is presently an unformed road section. See **Figure 6-4**. Vegetation removal is required along the proposed site access road or route immediately north of the Substation site and east to the western formed road end of Thrumster Street. Mapped threatened ecological communities (TECs) in the Port Macquarie Hastings LGA Vegetation and EEC (Maps 2014 VIS IDs 4205 and 4206) did not identify any TEC in the proposal site or access road. However, PCTs 4004 and 4047 are associated with four threatened ecological communities, with the vegetation patches in the proposal site and access road mapped as PCT 4004 and PCT 4047 not being clear-cut and their boundaries likely to intergrade.

Plant and animal species

Eighteen listed plant and animal species have been recorded on BioNet within 1500 metres of the proposal (see **Figure 6-5**). The field assessment of the proposal site for the ecological impact assessment did not observe any threatened species and the impact assessment generally concluded that the habitat value of the site was limited due to its small area, previously disturbed condition and the lack of hollow bearing trees and flowering eucalypts. It did find the site may provide feeding or resting habitat for some threatened species such as the Glossy Black Cockatoo and the Koala. The ecological assessment generated a list of predicted threatened species from the NSW threatened species list and the *EPBC Act* Protected Matters Search Report list. Based on this list, a ‘test’ and or an ‘assessment’ of significance under the *BC Act* and or the *EPBC Act* was undertaken where potential for a species to be impacted by the proposal was identified.

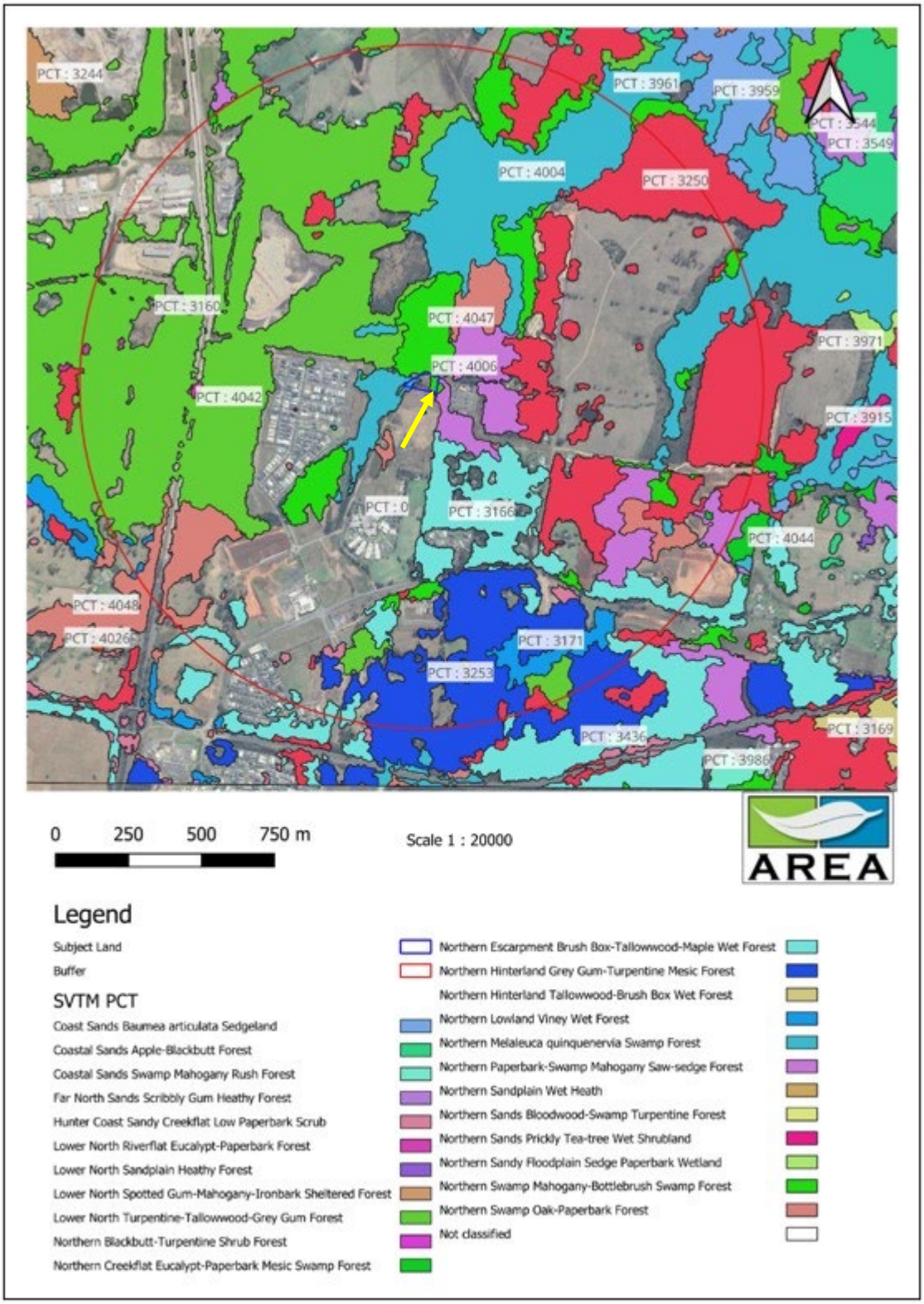


Figure 6-3: from the Ecological Impact Assessment for the proposal (see Appendix C); NSW State vegetation Plant Community Types Map of area surrounding the proposal site, which is at centre (see yellow arrow) (Area 2023)

Figure 6-4: from the Ecological Impact Assessment for the proposal (see Appendix B); showing PCTs 4004 and 4047 relative to the proposal site (Area 2023)

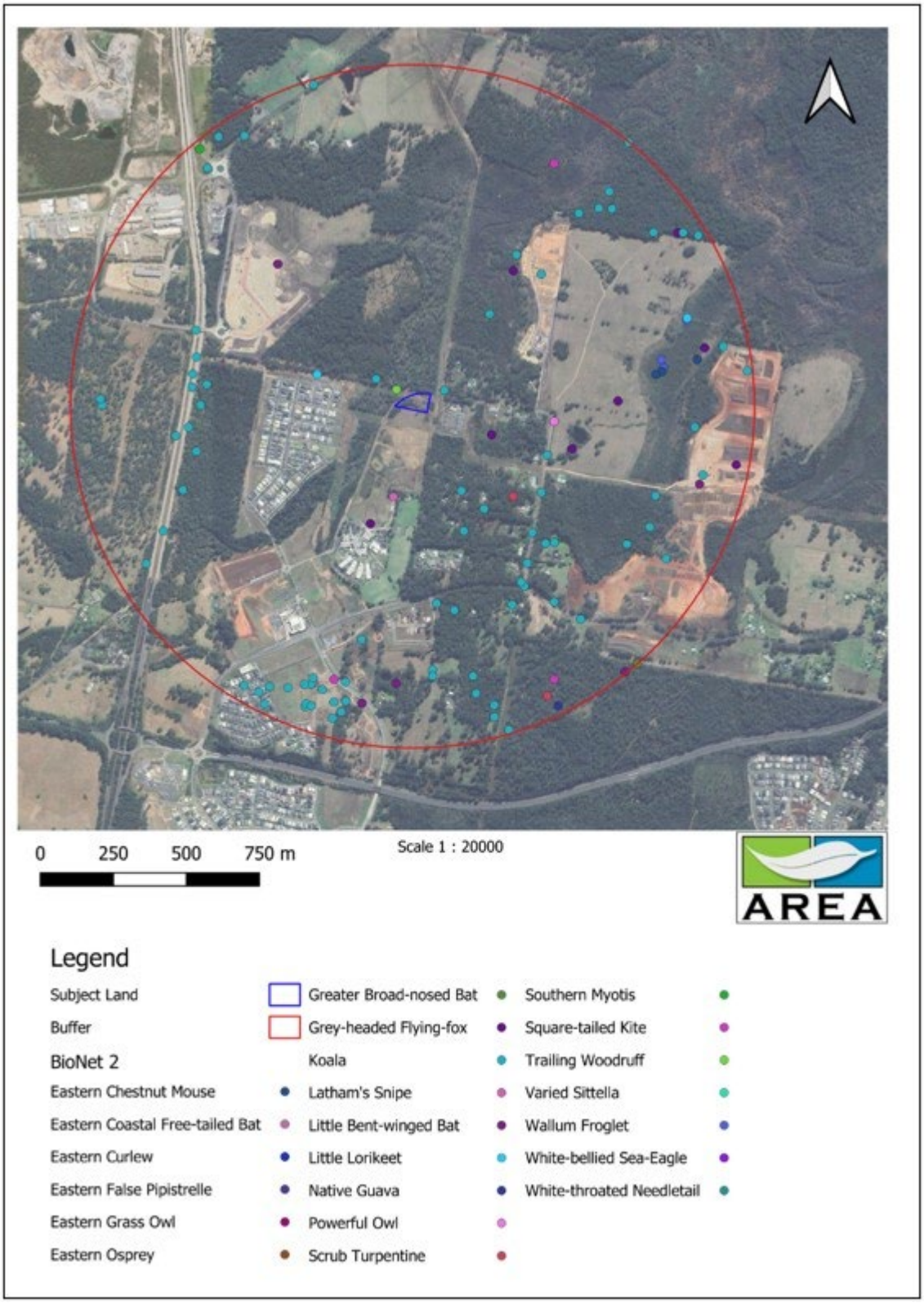


Figure 6-5: illustrates the distribution of NSW BioNet flora and fauna records surrounding the proposal site (Area 2023)

6.5.2 Proposal impacts

A total of 0.98 hectares, including 0.80 hectares within the proposed substation site and 0.18 hectares along the proposed access road, require clearing for development of the Substation. The total amount of vegetation to be cleared for the proposal, including the access road is approximately 0.25 hectares of PCT 4004 (Northern Melaleuca quinquenervia Swamp Forest) and 0.12 hectares of PCT 4047 (Northern Swamp Mahogany-Bottlebrush Swamp Forest), of which approximately 0.52 hectares of the Substation site and 0.09 hectares of the proposed road corridor

are already cleared.

Due to PCTs 4004 and 4047 inclusion in the *BC Act* listing for *Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* threatened ecological community (TEC), and PCT 4047 being included in the listing guidelines for *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregion* TEC, Tests of Significance (ToS) were prepared for these TECs. The ToS found for the proposal is unlikely to have a significant impact on the associated TECs.

PCTs 4004 and 4047 do not meet the condition thresholds for national protection listing as *Coastal Swamp Oak (casuarina glauca) Forest of New South Wales and South-east Queensland Ecological community* TEC under the *EPBC Act*. Therefore, the proposal was not considered likely to impact *Coastal Swamp Oak (casuarina glauca) Forest of New South Wales and South-east Queensland Ecological community* TEC.

Despite mapped PCT 4004 on the proposal site aligning with Department of Agriculture Water and Environment Conservation Advice for the *Coastal Swamp Sclerophyll Forests* TEC, it was found that due to the lack of native ground cover, the small patch size and because it has been cleared and modified in the recent past it was not considered to contribute greatly to the TECs conservation. Therefore the proposal was not considered likely to significantly impact *Coastal Swamp Sclerophyll Forests* TEC.

Where a species was identified as potentially being impacted by the proposal, a ‘test’ and or an ‘assessment’ of significance under the *BC Act* and or the *EPBC Act* was undertaken from the combined list of predicted threatened species. A ‘test’ and or an ‘assessment’ of significance was undertaken based on the field assessment results, the professional judgement of the ecologist, species specific information and the precautionary principle. The tests and assessments of significance carried out for the relevant protected species confirmed the proposal is unlikely to have a significant impact on listed species or their populations.

6.5.3 Mitigation measures and recommendations

The following mitigation measures are recommended to reduce the impact on threatened fauna with potential to occur in the subject site, and reduce other potential environmental impacts such as erosion or loss of habitat features:

- Vegetation clearing is strictly to be within the assessed areas of the proposed ZS site and proposed access road
- Clearing outside the assessed areas is not permitted without further assessment
- Minimise disturbance of the soil during vegetation removal to reduce the risk of erosion and sediment movement from the proposal site to elsewhere within the catchment area
- Appropriate erosion and sediment control measures must be installed during construction, with particular attention along the northern and western boundary of the subject area to prevent sediment exiting the site and entering Partridge Creek
- Essential Energy has a general biosecurity duty to ensure the biosecurity risks posed by weeds and other invasive species are prevented, eliminated, or minimised, and that the risk of importing additional weeds to the proposal site is appropriately managed
- Logs from felled trees may be retained adjacent to the site or in the local area to provide future habitat value
- A site induction program to ensure that all construction, operation and maintenance staff and contractors are aware of the need to, and how to avoid and protect vegetation outside proposal site.

6.5.4 Conclusion

The proposal is unlikely to have a significant impact on any threatened species, populations or threatened ecological communities within the subject site, and is not located on land mapped as outstanding biodiversity value. The proposal therefore does not require assessment under the Biodiversity Offset Scheme, or preparation of a Species Impact Statement and further assessment is not required.

6.6 Aboriginal Heritage

6.6.1 Existing environment

Desktop Assessment

A desktop assessment of Aboriginal heritage was undertaken in the general vicinity of the proposal site. A review of registered sites from Heritage NSW's Aboriginal Heritage Information Management System (AHIMS) (NSW Heritage 2024) was undertaken (refer **Appendix C**). The search revealed no Aboriginal sites or objects located within the footprint of the proposed ZS site. The closest registered sites, 30-3-0335 (Watoo 10) and 30-3-0207 (Brettar 1) are located approximately 130m northeast and 160m northwest of the proposed ZS, respectively (refer **Figure 6-6**).

The results of an extensive AHIMS search, and review of site cards, where available (**Appendix C**), indicated that site 30-3-0207 (Brettar 1) is an open camp site, comprised of five stone artefacts located together near the base of a large tree, recorded as a scarred tree. The five artefacts comprised of a mudstone core, mudstone flake, quartzite bipolar core and two siltsone flaked pieces. No description of the scar tree is provided. Site 30-3-0335 (Watoo 10) is recorded as an open site, containing one artefact, however no further information was obtained for this site, as the site card was not available from the AHIMS database.

In addition to the registered AHIMS sites, two Aboriginal places of heritage significance listed under Part 4 of Schedule 5 of the PMH LEP, Watoo 7 Thrumster Conservation Area (AH02), and Thrumster Knoll Site (AH03) are located approximately 1.5km and 2km east-northeast of the proposed ZS site, respectively (refer **Figure 6-7**).

Site Inspection

Essential Energy's Senior Environmental Engineer and Environmental Engineer undertook an inspection of the proposal site on 10 October 2023. The site inspection included a thorough walkover of the proposal site. Photographic and written records were made of the landscape features relevant to archaeological potential. These features include disturbance levels, Ground Surface Visibility (GSV) and where present, any landforms of higher archaeological potential.

Ground surface visibility (GSV) was generally low (less than 5%) across much of the proposal site, due to long grass and pockets of regrowth vegetation. GSV was much higher along an existing track, which was present as an arc through the centre of the proposal site (refer **Plate 1**). GSV along the access track was approximately 90%, with only short grass or imported rock, gravel and road base material noted. It was noted during the site inspection that the ground surface had been subject to a range of previous land use disturbances, including clearing, possible grazing, earthworks for the construction of a track arcing through the centre of the proposal site (refer **Plates 6-1** and **6-3**), an existing 33kV overhead powerline through the centre-north of the site (refer **Plate 6-2**), and evidence of underground sewer and telecommunication utilities along the northern boundary of the site (refer **Plate 6-4**). There was also a stockpile of fill material present along the southern boundary of the site, which may have extended onto the southern portion of the site (refer **Plate 6-5**). At the time of the preparation of this report, the origin of the stockpile was unknown. It may be associated with active subdivision work that is occurring to the south of the proposal site.

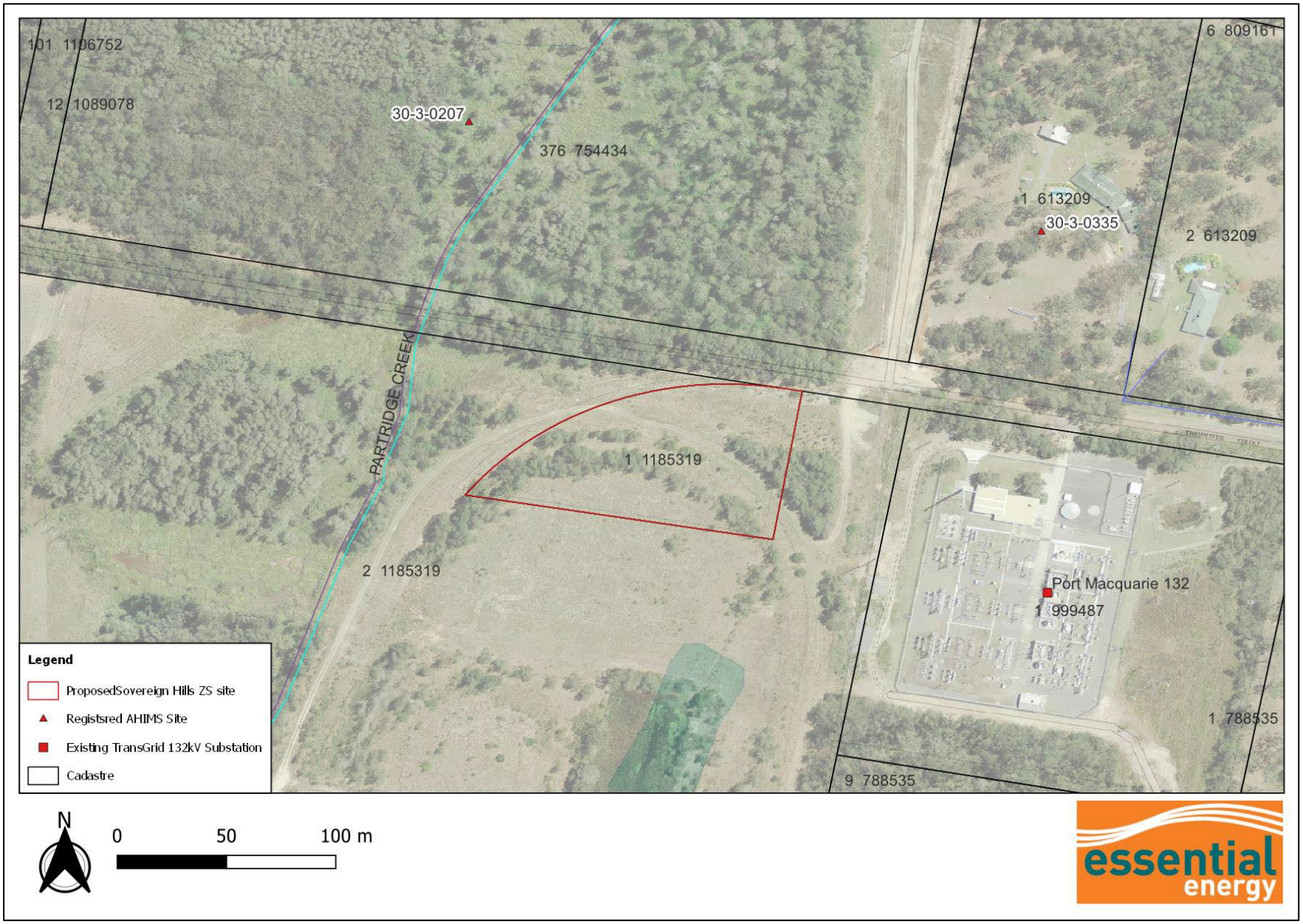


Figure 6-6: Registered AHIMS Site ID 30-3-0207 in the vicinity of the Proposal Site

Figure 6-?:

Figure 6-7: Aboriginal heritage places listed on PMH LEP 2011

Plate 6-1: Access road extending through the centre of the site, with regrowth vegetation either side.

Plate 6-2: Existing managed 32kV powerline corridor through centre-north of proposal site

Plate 6-3: Access road at western extent of site, with overhead 132kV powerline offsite to the south

Plate 6-4: Underground sewerage infrastructure running nearby to the overhead 33kV powerline

Plate 6-5: Stockpiled material along southern boundary of site

6.6.2 Assessment of impact

The *NPW Act* requires that proponents follow a due diligence approach regarding the protection of Aboriginal objects. There are three essential issues to consider when undertaking a due diligence assessment:

- The nature of the proposed activity (e.g. the extent of development impacts)
- Land condition and prior land uses (e.g. impacts to bushland or undisturbed ground, areas containing sandstone outcrops, rock shelters and overhangs, old growth trees, sand bodies, ground adjacent to creeks, rivers, lakes and swamps)
- Knowledge and available information (e.g. AHIMS database search, previous reports or studies relating to the site or in the area, and local knowledge, such as councils or Local Aboriginal Land Councils (LALC)).

An assessment against the due diligence requirements is provided in **Table 6-3**.

Table 6-3: Assessment against due diligence requirements

Step	Question	Response	Process
1	Are you disturbing the ground surface or culturally modified tree?	Yes ☑ No ☐	If Yes proceed to Step 2 If No AHIP not required proceed with caution
2	Check AHIMS – working near known Aboriginal sites? http://www.environment.nsw.gov.au/awssapp/login.aspx	Yes ☐ No ☑	If yes obtain site cards and proceed to Step 4 If No proceed to Step 3
3	Is the proposed activity on disturbed (e.g., ploughing, cleared vegetation, grazing) land? Check the land use layer	Yes ☑ No ☐	If Yes AHIP not required proceed with caution. If No proceed to step 4

4	Confirm the following: a) Does any other source of information indicate likely presence of Aboriginal heritage? (previous studies)? and/or b) Landscape features are likely to indicate presence of Aboriginal objects (e.g., within 200m of water, below or above a cliff face, located within a dune system, within 20m of or in a cave, rock shelter and is land not disturbed)? and/or c) Objects will, or are likely to be harmed?	Yes ☐ No ☐	If Yes to any or all questions further investigations or an AHIP is required If No AHIP not require proceed with caution

The proposal site has been subjected to varying degrees of historic and current land disturbance associated with clearing, possible grazing, and the construction of a track, overhead powerline, and underground sewer and telecommunication utilities. As such, the land on which the proposal site will be located can be considered disturbed land in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (NSW DECCW, 2010), due to past impacts of clearing, grazing and utility construction.

The AHIMS search indicated no sites or places of Aboriginal heritage identified within the footprint of the proposed new ZS site. Two registered sites, AHIMS ID 30-3-0335 (Watoo 10) and AHIMS ID 30-3-0207 (Brettar 1) are located approximately 130m northeast and 160m northwest of the proposed ZS, respectively. Brettar 1, an open site, consists of five artefacts near the base of a scarred tree, and would not be impacted by the proposal. Watoo 10 is also an open site, however further information on the site could not be obtained as the site card was not available from the AHIMS database. Given the distance from the proposal site and being located on private property, it is unlikely this object would be harmed by the proposal.

The two Aboriginal places listed under the PMHC LEP, Watoo 7 Thrumster Conservation Area (AH02), and Thrumster Knoll Site (AH03), are located at sufficient distances from the proposal site (1.5km and 2km east-northeast of the proposed ZS site, respectively) that harm to these sites would not occur as a result of the proposal.

No trees exhibiting signs of cultural modification (scarring) have been identified within the proposal site. Information obtained from the site card for Brettar 1 indicated the site contained a scarred tree, however details of the scar were not recorded. Brettar 1 is located approximately 160m northwest of the proposal site and as such will not be harmed as a result of the proposal.

Considering the highly disturbed nature of the proposal site, the distance from known Aboriginal heritage sites, and the mitigation measures proposed in **Section 6.6.3**, the proposal is not likely to impact Aboriginal heritage.

6.6.3 Environmental mitigation measures

To mitigate any potential impacts on Aboriginal heritage, the following measures will be employed:

- In the unlikely event that an Aboriginal heritage site or object is located during the construction phase of the project, works will cease in that area and a representative from Essential Energy's Environmental Services will be notified. Works with the potential to disturb the object would not resume until the object had been properly identified, and appropriate action taken under the NPW Regulation 2019 and NPW Act 1974
- If human remains are uncovered, works must immediately cease, and the NSW Police department and Essential Energy's Environmental Services team must be notified.

6.6.4 Conclusion

The proposal is not anticipated to have any impact upon Aboriginal heritage in the area. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered to be low.

6.7 Non-Aboriginal Heritage

6.7.1 Existing environment

Non-Aboriginal heritage refers to any deposit, object or material evidence which relates to the settlement of New South Wales, not being Aboriginal settlement, and is of state or local heritage

significance (Section 4 of the *Heritage Act*).

A desktop search of Australia's World Heritage Sites (Commonwealth DCCEEW, 2023b), National Heritage List (Commonwealth DCCEEW, 2023c), NSW State Heritage Inventory (Heritage NSW, 2023), and PMH LEP was conducted to determine the extent of non-Aboriginal heritage in the vicinity of the proposal.

6.7.2 Assessment of impact

A review of the above-mentioned heritage registers indicated no sites of world, national, state or local heritage significance are located within, or intersected by, the boundary of the proposal site.

6.7.3 Environmental mitigation measures

The following mitigation measures would be applied:

- All construction work would be undertaken within the assessed areas of the proposal site only.
- In the unlikely event that a previously unknown heritage site or object is located during construction of the proposal, works would cease immediately in that area and a representative from Essential Energy's Environmental Services would be notified. Works with the potential to disturb the object would not resume until the object had been properly identified, and appropriate action taken.

6.7.4 Conclusion

The proposal is unlikely to have a significant impact upon non-Aboriginal heritage in the area. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered low.

6.8 Contamination

6.8.1 Existing environment

Previous and current land use within the study area may have resulted in the contamination of soils. Potential on-site sources of contamination could include illegal dumping of waste materials as well as past use of and weed and pest spraying. There are no known introduced contaminants in the area, however a precautionary approach shall be applied during the works. Acid sulfate soils are mapped as occurring directly adjacent and encroaching into the proposal site along its western and northern boundaries (see **6.2 Geology and Soil** and **Figure 6-2**).

A search of the NSW EPA 'Contaminated Land – Record of Notices' (EPA, 2023a) and 'List of NSW Contaminated Sites Notified to EPA' (EPA, 2023b) did not identify any contaminated sites within or in the vicinity of the proposal site.

A search of NSW Department of Primary Industries (DPI) Cattle Tick Dip Site Locator did not indicate any tick dip sites within or in the near vicinity of the proposal site.

6.8.2 Assessment of impact

There are no known records of contamination at, or within the near vicinity of, the proposal site. The proposal site and area extending south to near John Oxley Drive has undergone vegetation clearing and benching activities associated with previous and subsequent development. No areas of contamination are known at or in the area are know from that process and there is unlikely to be any further contamination risks on the proposal site. Therefore, the risk of encountering significant areas of contamination is considered low and could be managed on-site during construction.

In the Hopkins (2023) report it was noted that RGS (2023) stated that Port Macquarie has a unique geology in which naturally occurring heavy metals are found extensively throughout the shire and there is a significant likelihood this could be the case at the proposal site. The presence of heavy metals in excavated material may significantly influence disposal costs, depending on the material's classification.

Spillage of diesel, lubricating oils or other chemicals could occur during refuelling and/or maintenance of construction plant/equipment and vehicles, whilst leakage of fuels or oils could occur from poorly maintained construction plant/equipment and vehicles. Any on-site chemical spill or leak could adversely affect the water quality of surrounding waterways. The risk of chemical spills and leaks is expected to be minor, provided that adequate mitigation measures are implemented (see **Section 6.8.3**).

6.8.3 Environmental mitigation measures

The following mitigation measures will be adopted if and where required:

- It is intended to reuse surplus spoil beneficially on site if available.
- Essential Energy's CEOP8064 Management of Excavated Material; Guideline for Construction Sites will be consulted to determine the most appropriate beneficial reuse or disposal method for excavated materials.
- In the event of encountering any suspected contamination in the work area, it will be separated and contained on site until it can be classified in accordance with the EPA (2014) Waste Classification Guidelines, and then disposed of at a facility that is lawfully able to accept the waste.
- Control measures will be implemented to manage risks associated with the handling of fuel through using spill trays when undertaking in field re-fuelling.
- Appropriate erosion and sediment controls will be established and maintained in accordance with The Blue Book to minimise potential impacts on receiving watercourses.

6.8.4 Conclusion

The proposal is not anticipated to have any impact upon contamination in the area. Given the mitigation measures outlined in this assessment, the overall environmental risk from or of causing contamination is considered low.

6.9 Electric and Magnetic Fields

6.9.1 Existing environment

Electric and magnetic fields (EMF) are part of the natural environment and are present in the Earth's core and the atmosphere. EMF is also produced wherever electricity or electrical equipment are in use. Powerlines, electrical wiring, household appliances and electrical equipment all produce EMF.

The electric field is proportional to the voltage (which can be considered as the pressure with which electricity is pushed through the wires). The magnetic field is proportional to the current, that is, to the amount of electricity flowing through the wires. Both electric and magnetic fields are also dependent on the source geometry (i.e. conductor heights, cable depths, phase separations and so on). All fields decrease rapidly with distance from the source. Generally, the smaller the object or closer the conductors producing the field, the more rapidly the field would decrease with distance from the source. Essential Energy is aware of concerns in the community and some scientists regarding the possibility of adverse health effects from exposure to EMF.

All the research has been extensively reviewed over the last 30 years by Australian and international inquiries and expert panels established for the purpose of determining whether or not human exposure to EMF is related to adverse health effects.

There is scientific consensus that health effects have not been established, however the possibility cannot be ruled out. Some scientists argue that there is a need for ongoing high quality scientific research to give better answers to the questions which have been raised. Others hold the view that no further research is required, and that EMF should not be regarded as a risk to health.

It is well accepted by scientists that no study considered in isolation would provide a meaningful answer to the question of whether EMF can contribute to adverse health effects or not. To make an informed conclusion from all of the research, it is necessary to consider the science in its totality. Over many years, governments and regulatory agencies around the world have commissioned independent scientific review panels to provide such an overall assessment. The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA), as part of the Health and Ageing Portfolio, is a Federal Government agency charged with responsibility for protecting the health and safety of people, and the environment, from EMF.

ARPANSA advises that:

> "On balance, the scientific evidence does not indicate that exposure to 50 Hz EMFs found around the home, the office or near power lines is a hazard to human health."
>
> "… the majority of scientists and Australian radiation health authorities in particular, do not regard chronic exposure to 50 Hz electric and magnetic fields at the levels commonly found in the environment as a proven health risk. Moreover, the evidence we have is inconclusive and does not allow health authorities to decide whether there is a specific magnetic field level above which chronic exposure is dangerous or compromises human health."

"At the present time there is no evidence that exposure to electric fields is a health hazard (of course excluding electric shock)."

There are currently no Australian standards regulating exposure to these fields. The National Health and Medical Research Council has issued interim guidelines on limits of exposure to 50/60 Hz electric and magnetic fields. These guidelines are aimed at preventing immediate health effects resulting from exposure to these fields. The recommended magnetic field exposure limit for members of the public (24 hour exposure) is 0.1 millitesla (1,000 mG - milligauss) and for occupational exposure (whole working day) is 0.5 millitesla (5,000 mG).

Essential Energy operates its powerlines, substations, and other electrical infrastructure well within these interim guideline limits.

Essential Energy's policy involves providing balanced and accurate information, operating our electrical power system prudently within Australian health guidelines, and closely monitoring scientific research on the EMF health issue.

6.9.2 Assessment of impact

The proposed new 33/11kV ZS incorporates prudent EMF avoidance measures into the standard designs for substations. The design of the proposal has minimised the magnetic field as far as technically reasonable and within the context of "…[doing] whatever can be done without undue inconvenience and at modest expense to avert the possible risk [to health]", consistent with Gibbs Inquiry (1991).

Given the closest sensitive residential receivers are 200m away, it is unlikely the new ZS will expose sensitive receivers to EMF.

6.9.3 Conclusion

The proposal will comply with all relevant national and international guidelines. The resulting magnetic fields from the substation are within the range of fields expected from electricity infrastructure in the area. The overall environmental risk is considered low.

6.10 Visual and Aesthetics

6.10.1 Approach

The following visual amenity assessment approach was applied to evaluate the potential visual impacts associated with the project. It is based on a professionally recognised system developed by the United States Forest Service (1974), and similar methods adopted by the Forestry Commission of Tasmania (1983) and the NSW Department of Planning (1980).

The approach used in this assessment is as follows:

- The existing visual environment of the site is described (in terms of landscape character, scenic quality, visual and landscape sensitivity and major view points);
- A brief description is made of the proposed visual changes; and
- An impact assessment is then undertaken, assessing both the changes to the site itself, and any impacts to views from surrounding areas.

The visual impact of the proposed activity has been determined though the interaction of visual modification and visual sensitivity. These are discussed in more detail in the following sections. The 'visual impact matrix', illustrated in **Table 6-4**, is used to determine the potential visual impact of the proposed activity by combining a ranking of high, medium, and low for both visual modification and visual sensitivity.

Table 6-4: Visual impact matrix

Visual Modification	Visual Sensitivity: High	Visual Sensitivity: Medium	Visual Sensitivity: Low
High	High Impact	High Impact	Moderate Impact
Medium	High Impact	Moderate Impact	Minor Impact
Low	Moderate Impact	Minor Impact	Minor Impact

6.10.2 Visual modification

Visual modification expresses the visual interaction between the proposal and the existing visual environment. It is the visual contrast between pre and post-development, and is a combination of the appearance of the development (size, form, colour, texture), absorptive capacity of the landscape setting, and the distance from which the development is viewed. Visual modification is expressed here as high, medium, or low.

High modification

A high degree of visual modification would result if the proposed developments is a major element and contrasts strongly with the existing landscape. The contrast is likely to occur if there is little or no natural screening or integration created by vegetation, or if there is an open plain. For example, powerlines passing over vegetated ridge tops also usually represent a high visual modification, particularly if it is a new powerline passing through otherwise undisturbed vegetated terrain and the viewer is parallel to the line.

Medium visual modification

A medium degree of visual modification would result if the proposed developments is visible and contrasts with the landscape but are integrated to some degree. This would happen if the surrounding vegetation and/or topography provide some measure of visual screening, backgrounding, or other form of visual integration of the development with its setting. An example of a medium visual modification is an urbanised streetscape with existing powerlines and/or established trees on the roadside.

Low visual modification

A low degree of visual modification occurs if there is minimal visual contrast and a high level of integration of size, form, colour or texture between the development and the environment. This would occur if there is a high degree of visual integration of the development into the existing landscape or a low level of visual modification of the existing visual setting is achieved. A low visual modification may reflect a situation where the development may be noticeable, but it does not markedly contrast with the existing landscape, as is the case with upgrading existing powerlines.

Throughout the study area, the degree of visual modification is highly dependent on the distance the viewer is from a new development. As the distance from the new development to the viewing location increases, the development becomes less prominent, and therefore its visual modification is less.

Visual modification is also affected by the angle at which a new development is viewed. In general, the visual modification when viewing the new development at right angles is less than when viewing in parallel, depending on the distance from the new development.

6.10.3 Visual sensitivity

Visual sensitivity is a measure of how critically a change to the existing landscape would be viewed from various viewpoints. This is dependent on several viewer characteristics, such as the number of viewers affected, land use, existing vegetation patterns, distance of the development from viewers, and the visibility of the development from critical viewing locations.

High visual sensitivity

Occupiers of residential properties with long viewing periods adjacent or within proximity to the proposal. High sensitivity areas can also apply to users of outdoor recreational areas, including

reserved land or nature recreation such as walking, swimming, fishing, or trail riding. This is particularly the case where their attention is focussed, in part, on the landscape and amenity that is being affected by the proposed development.

Medium sensitivity

Medium sensitivity would apply to circumstances in which viewers have intermittent exposure, such as outdoor workers and outdoor recreation users, however, for the recreational user, attention is focussed predominantly on the activity they are viewing, such as a sporting event, rather than the proposed development. In addition, medium sensitivity would also apply to occupiers of residential properties with long viewing periods at a distance from or partially screened from the proposed development or project area.

Low sensitivity

Low sensitive viewers include predominantly those groups that have a short-term view of the proposed development. This would be limited to mainly road users, trains or transport routes that are passing through or adjacent to the study area. Low sensitivity would also apply where viewers are adequately screened from the proposed development so that their viewing periods are limited to short periods.

6.10.4 Existing visual environment (landscape description)

The proposal site is situated on cleared and more recently unused land that was subject to a previous unknown open space type use with subsequent limited vegetation regrowth. More recently the areas further south and west of the proposal site have undergone residential and commercial development with further development proposed throughout the Sovereign Hills Estate. According to the Sovereign Hills Estate Master Plan, regional sporting fields are proposed to be established south of the proposal site, which appears to currently be used for spoil stockpiling. The proposed sporting field area will extent to the south up to 500m or more to adjoin recent educational facility development. The western formed road end of Thrumster Street features the PMTS nearest the proposal site, and a larger lot residential property opposite, it being the nearest existing sensitive receiver [at 200m form the proposal site]. Significant remnant areas of forest remain adjacent to the west and north, albeit traversed by maintained powerline corridors. Vegetation remains prominent adjacent the western formed road end of Thrumster Street.

6.10.5 Visual changes

Construction of the new SHZS will be carried out on what was a previously developed site, given the previous clearing and vehicle track benching works evident and known to have occurred. Furthermore, the new ZS will be developed at the northern end of the developing Sovereign Hills Estate urban area adjacent proposed sporting fields that are part of the Estate area's longer-term development plan.

The proposed SHZS will predominantly be an indoor facility, the only external equipment being the transformers. The ZS will comprise two outdoor transformer bays, with the high voltage switchgear operating indoors within a masonry tilt panel building with amenities, control equipment, underground cabling and associated conduits, and auxiliary equipment and structures including lightning masts, fencing, low landscaping, and driveways. Fencing and landscaping will be selected to be sympathetic with the surrounding, whilst also providing the necessary security required for an electrical substation. Over the short-term, there will be a high degree of visual change associated with site preparatory works, and civil works for construction of the ZS, access road and underground 33kV cables.

Over the longer term the ZS will result in a permanent change in the visual landscape. However, given the proposal site's relative isolation, being at the northern extent of proposed regional sporting fields, surrounded to the west and north by remnant forested areas, and being at approximately 200m to the nearest residences with sparse, though effective screening vegetation, in between, the visual modification is expected to be medium over the longer term. Views of the ZS will be of short duration and transitory in nature for drivers of vehicles using the western end of Thrumster Street. Views of the ZS will be partial and intermittent for the few residents occupying residences at the northwestern end of Thrumster Street that would have a limited view to the ZS. Views of the ZS would be of short duration and intermittent for the ultimate users of the proposed sporting fields that will be developed to the south of the substation, with their attention being focussed predominantly on the sporting activity they are likely viewing, rather than the ZS.

Given the distance and remaining existing screening vegetation, other infrastructure including the PMTS, and that activities at the proposed adjacent [sporting fields] development will be the focus of

visitors to that area, direct and sustained views of the proposal site are not anticipated. Also, given the developing urban character of the landscape generally in which the proposal site is located and again the distances to the nearest sensitive residential receivers and next nearest potentially sensitive receivers, visual sensitivity is considered medium to low.

6.10.6 Summary of potential impacts

Visual modification has been assessed as being medium over the longer term, whilst visual sensitivity is considered low to medium. In accordance with the visual impact matrix, the proposed activity is likely to result in a low to moderate visual impact.

6.11 Waste

6.11.1 Assessment of impact

Waste material generated from the proposal would generally comprise the following:

- General construction waste including but not limited to cardboard, paper, wood, mesh, steel, concrete, and other damaged or excess construction materials.
- General refuse generated by personnel including putrescible wastes, food scraps, packaging, and other domestic wastes.
- Surplus excavated soil material from excavation and trenching works.

Any surplus soil that cannot be reused on site will be assessed against the virgin excavated natural material (VENM) criteria, any relevant waste exemption order, or classified and disposed of at a facility lawfully able to accept the waste.

Operation of the SHZS is not expected to generate any substantial quantities of waste material.

6.11.2 Environmental mitigation measures

The following mitigation measures will be employed to minimise and manage impacts to waste:

- All wastes that are generated because of the project that cannot meet the criteria of a waste exemption or reused on site will be classified in accordance with the Waste Classification Guidelines (EPA, 2014)
- All waste material will be reused, recycled, or disposed of at a facility lawfully capable of receiving the waste.

6.11.3 Conclusion

The proposal is not anticipated to generate a large quantity of waste. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered low.

6.12 Bushfire

6.12.1 Existing environment

The proposal site is located on land mapped as Category 3 bushfire prone land with Category 1 bushfire prone land adjacent to the west and north (refer **Figure 6-8**).

6.12.2 Environmental impact assessment

The proposal comprises the construction of a new ZS on what is zoned as RE1 Public Recreation land, which is predominantly cleared except for grass cover and limited tree and shrub/understorey plant regrowth at and to the south. Clearing would remove the limited regrowth on the site. Hot-work activities with the potential to generate sparks will be avoided where possible during times of heightened bushfire risk.

6.12.3 Environmental mitigation measures

Ongoing vegetation maintenance would occur to ensure safe clearance distances are maintained around the ZS perimeter to reasonably mitigate the risk to the ZS from bushfire and of the Substation causing bushfire.

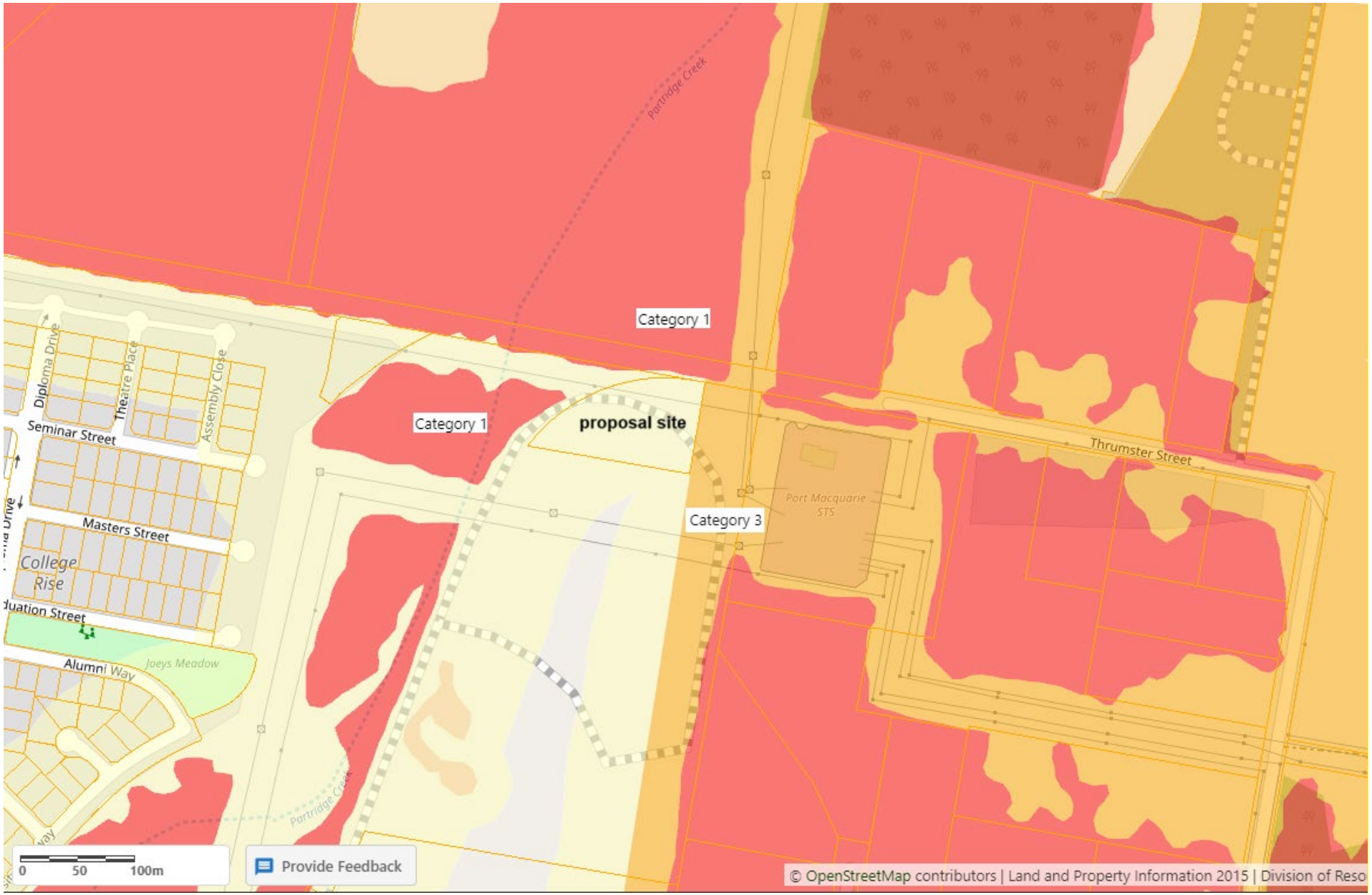


Figure 6-8: Mapped bushfire prone land in the vicinity of the proposal

6.13 Traffic and Access

6.13.1 Existing environment

The proposal site will be located beyond the existing western formed road end of Thrumster Street. Vehicle access to the site is currently limited to via a previously formed track from the south beyond College Road. This existing access track from south of the proposal site is not proposed to be utilised for construction or operational access.

6.13.2 Environmental impact assessment

An access road extension beyond the western formed road end of Thrumster Street is proposed to be constructed to access the proposal site for construction and operation (see **Appendix A**). During construction, the work site will receive multiple vehicle movements per day ranging from light utility vehicles through to heavy commercial machinery and trucks, the latter of which will dominate traffic movements during bulk earthwork (i.e., cut and fill) activities. RGS (2023) estimated that approximately 6,498m^3 of unsuitable material requires removal from site, while an estimated net 13,384m^3 of selected fill material will be imported to site. Therefore, a total of 19,882m^3 of material will be required to be transported from and to the site. Using a bulk density of 1.6 tonnes/m^3, as suggested by RGS (2023) for earthworks calculations, this equates to approximately 12,426 tonnes. A typical truck and dog setup has a capacity of approximately 42 tonnes, so that would equate to approximately 296 truckloads.

Due to the far western end of the Thrumster Street local road not being necessary for access for local road users aside for u-turning, it is not anticipated that construction, including the export and import of materia,l anddelivery of large plant and equipment, will cause delays or inconvenience to local road users.

During operation, the proposal would only be accessed irregularly by maintenance personnel. The proposal would not strain the capacity of the road system.

6.13.3 Environmental mitigation measures

The following mitigation measures will be employed:

- The need for a traffic management plan (TMP) for the construction phase would be determined and, if required, completed prior to works commencing. The TMP would outline requirements for the safe and continued use of local transport corridors during construction.

6.13.4 Conclusion

The proposal would have traffic and access impacts during construction and maintenance operations. Impacts would be moderate to high during bulk earthworks, but would be for a short duration only (i.e., only during excavation and filling). . There would be limited to no traffic impacts once bulk earth works are complete. Traffic impacts during the remainder of the construction phase, as well an operation and maintenance phases would be negligible to nil. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered low.

6.14 Land Use

6.14.1 Existing environment

The proposal site is at the northern extent of a developing urban area known as Sovereign Hills. The Sovereign Hills area more broadly has experienced recent residential, retail, and commercial development predominantly south of proposal site, with residential development occurring to the west beyond a forested tract of land. A future sporting fields facility, known as the Thrumster Sporting Fields, are proposed south of the proposal site. The proposed sporting facility is planned to include multi-use premier level sporting fields, synthetic playing fields, car parking, field irrigation, access roads, lighting, landscaping, spectator mounds, a clubhouse and amenities building complete with grandstand (PMHC, 2024).

The proposal site is currently zoned RE1 Public Recreation land, according to the PMH LEP.

6.14.2 Assessment of impact

The construction of the new SHZS will change a small portion of land use from the current, though yet to be developed, public recreation use to a commercial/industrial use, with the proposal site located at the far northern end of the proposed or future Thrumster Sporting Fields development area. Existing 132kV and 33kV powerline easements located on land immediately south of the proposed ZS site will provide a buffer between the ZS and the proposed future Thrumster Sporting Fields, minimising potential for future land use conflicts.

6.14.3 Environmental mitigation measures

The following measures should be adhered to during the construction phase of the proposed activity:

- Consultation about the proposed works and schedule will be undertaken directly with the surrounding Lot 3, DP 1293093 landowner/developer.
- The site should be left in a tidy condition at the conclusion of construction activities.

6.14.4 Conclusion

Any impacts on land use are likely to be minor and manageable. Given the nature of existing land uses, the overall environmental risk is considered low.

6.15 Social and Economic

6.15.1 Existing environment

Electricity is an essential service in the human environment, by enhancing productivity, comfort, safety, health, and the economy. The benefits of a secure and reliable electricity supply are evident in every aspect of our lives. Construction and operation of the SHZS will support the social and economic development of Sovereign Hills and the Port Macquarie regional more broadly, ensuring safe and reliable electricity supply to the area.

PMHC has adopted the Port Macquarie-Hastings Urban Growth Management Strategy 2017-2036 PMHC 2018). This Strategy is intended help plan and deliver growth and change, provide new housing and economic development, and inform the PMH LEP and the assessment of planning proposals and development applications. The Sovereign Hills Master Plan (LLG 2023) details current and proposed or future development of the Sovereign Hills Estate. It is similarly intended to drive delivery of homes, retail, and community facilities for the Sovereign Hills area. Sovereign Hills is forecast to have 7,000 residents and associated services by 2036, with 300 to 400 annual new residential customers from FY23/24. The SHZS has been designed to accommodate future development of the Sovereign Hills area.

6.15.2 Environmental impact assessment

An improvement to the electricity supply network provides many benefits to the broader community through a secure and reliable electricity supply. The construction and operation of the new SHZS will be undertaken on Essential Energy property, at the northern end of a developing subdivision.

Without upgrading the existing electricity infrastructure in the area there is an increased risk of supply interruptions, and it is unlikely that the SHZS could proceed with a reliable electricity supply. This would detrimentally impact on economic and social development of the region, and potentially prove to be disruptive to existing commercial enterprises and to residences throughout the local area.

The proposal is unlikely to affect community resources; this may include the use of community infrastructure roads, water, and waste management services. The proposal is unlikely to cause substantial change or disruption to the community through loss of neighbourhood cohesion, access to facilities, community identity, or cultural character.

6.15.3 Environmental mitigation measures

The following mitigation measures will be employed to manage and minimise potential negative social and economic impacts:

- Management of construction traffic in the vicinity of construction works, including communication with local residents and road users.
- Signs and barriers would be erected around construction work sites, where appropriate, to minimise the possibility of personnel injuries and prevent placing the public at risk.

6.15.4 Conclusion

Construction will be temporary in nature, and apart from some changes to the visual amenity, long-term impacts are not expected.

The social impact would be short-term and minor. Given the mitigation measures outlined in this assessment, the overall environmental risk is considered low.

6.16 Cumulative Impacts

Construction of the new ZS will also include construction of two a new high voltage 33kV underground cables to supply the new ZS from the nearby PMTS located immediately east of the new ZS, and construction of an access road to the ZS from the western end of Thrumster Street.

Cumulative impacts may be experienced due to the interaction of elements associated the ZS development proposal, or with other existing or proposed developments within the locality. The proposal site is located at the far end of a developing urban area within part of a previously cleared larger lot beyond proposed future playing fields. As such, any potential cumulative impacts to threatened species, populations and ecological communities from the construction, operation, and maintenance of the ZS will be negligible to nil, and will not be likely to result in a significant impact.

Similarly, given the relatively small disturbance footprint and the localised extent of potential impacts during construction and operational phases, the potential cumulative impact to other environmental factors during construction and operation of the ZS has been minimised to the greatest extent possible, and would not be significant. Any residual, minor impacts identified in this section of the REF, can be managed and mitigated through the range of measures outlined in this section and summarised in **Table 6-5**.

Vegetation removal is required to proceed with the ZS development. As detailed at in **6.5 Flora and Fauna**, a specialist ecological impact assessment (see **Appendix B**), including ToS found there would be no significant impact to threatened species, populations or TECs within the proposal site, and the site is not located on land mapped as having outstanding biodiversity value.

6.17 Summary of Environmental Mitigation Measures

The environmental mitigation measures outlined in this document would be incorporated into the Project Construction Environmental Management Plan (CEMP) for the proposal, including environmental awareness training must be provided to all field personnel, contractors, and subcontractors. These safeguards would minimise any potential adverse impacts arising from the proposal construction works and operation on the surrounding environment. The mitigation measures are summarised in **Table 6-5** below.

Table 6-5: Summary of Environmental Mitigation Measures

Aspect	Environmental Mitigation Measures	Timing
General	• All environmental mitigation measures must be incorporated within the Construction Environmental Management Plan (CEMP), or relevant works plan as applicable for the proposed works	Pre-works
General	• Environmental awareness training must be provided to all field personnel, contractors, and subcontractors	Pre-works and during works as required
Consultation	• Essential Energy has consulted with TransGrid, and Port Macquarie Hastings Council regarding the proposed works. Construction notification will be provided as appropriate prior and during the works.	Prior to and during works.
Licences, Permits, Approvals and Notifications	• Notification to the local council and occupiers of adjoining land in accordance with clause 2.45 of *State Environmental Planning Policy (Transport and Infrastructure) 2021* • Notification to the local council in accordance with clause section 45 of the *Electricity Supply Act 1995* • Section 68 approval under the *Local Government Act 1994* will be required for construction and extension of the water supply and sewerage service pipes or fittings or fixtures communicating or intended to communicate, directly or indirectly, with any water supply and sewer of a council	21 days prior to works commencing. 40 days prior to works commencing. This notification has been sent Prior to commencing construction of the ZS
Air Quality	• Any potential dust-borne materials transported to and from the activity site will be always covered during transportation • Any temporary stockpiles of surplus excavated material will be covered or wet down during dry and windy conditions • All vehicles and machinery will be well maintained according to manufacturer requirements to ensure emissions are kept within acceptable limits	During works
Geology and Soil	• Risks associated with erosion and sediment will be managed in accordance with The Blue Book – Managing Urban Stormwater: Soils and Construction (Landcom 2004) • Ares of vegetation cover disturbance will be minimised and disturbed areas will be stabilised as soon as practicable following construction activities • Essential Energy's CEOP8064 Management of Excavated Material; Guideline for Construction Sites will be consulted to determine the most appropriate beneficial reuse or disposal method for any surplus excavated materials • Any excavated material along the northern boundary of the ZS lot and edge of access road will be	During works

Aspect	Environmental Mitigation Measures	Timing
	examined for properties that indicate the likely presence of potential or actual acid sulfate soil (e.g. saturation, blue-grey colouring, odour of hydrogen sulfide gas [strong smell of rotten eggs]). If acid sulfate soil encountered, it will be managed in accordance with the acid sulfate management plan as described in Essential Energy's HSE Manual: Land Use (CECM 1000.76) or the development of a site-specific management plan	
Water Quality and Hydrology	• Control measures will be implemented to manage risks associated with the handling of fuel through using spill trays when undertaking in field re-fuelling • Disturbed areas will be managed in accordance with the requirements of the Blue Book to minimise potential impacts to waterways. Sediment fencing or other appropriate erosion and sediment controls will be implemented and maintained where required, including upslope and downslope of disturbed areas as appropriate, and impacts would be minimised where practicable. The use of filter bags may be required to discharge collected sediment-laden water where there are insufficient grassed areas available • Any water collected in excavations and trenches during rainfall and surface water ingress should be pumped to a grassed area on-site (where a suitable area is available) to allow for infiltration, reused for dust suppression, or pumped to stormwater using a sediment sock. All de-watering options should be conducted in a manner that does not result in turbid water entering the stormwater system or nearby waterway • The extent of the proposal site will be benched to the current general maximum relative level of the site to minimise the risk to the site from flood, noting the proposal site is not within flood liable land.	During works

Noise and Vibration	• In considering the isolated character of the proposed substation site location, being at least 200m from the nearest sensitive residential receiver, work hours will be between 7am and 6pm Monday to Saturday. On occasions works outside these hours may be undertaken where the following requirements are met:
	  • Neighbours (and other sensitive receivers) adjacent to the works or the local council or the NSW Environment Protection Authority (EPA) have been notified; and
	  • Where the works are required to take place in the vicinity of private access ways or driveways, consultation with individual residents would be undertaken to advise residents of the planned timing of the works.
	• All plant and equipment will be operated and maintained in accordance with the manufacturer's specifications. Any noise complaint will be investigated with additional control measures put in place if required.
		During works

Flora and Fauna	• Vegetation clearing is strictly to be within the assessed areas of the proposed ZS site and proposed access road • Clearing outside the assessed areas is not permitted without further assessment	Pre-works, during works and post works

Aspect	Environmental Mitigation Measures	Timing
	• Minimise disturbance of the soil during vegetation removal to reduce the risk of erosion and sediment movement from the proposal site to elsewhere within the catchment area • Appropriate erosion and sediment control measures must be installed during constriction, with particular attention along the northern and western boundary of the subject area to prevent sediment exiting the site and entering Partridge Creek • Essential Energy has a general biosecurity duty to ensure the biosecurity risks posed by weeds and other invasive species are prevented, eliminated, or minimised, and that the risk of importing additional weeds to the proposal site is appropriately managed • Logs from felled trees may be retained adjacent to the site or in the local area to provide future habitat value • A site induction program to ensure that all construction, operation and maintenance staff and contractors are aware of the need to, and how to avoid and protect vegetation outside proposal site	
Aboriginal Heritage	• In the unlikely event that an Aboriginal heritage site or object is located during the construction phase of the project, works will cease in that area and a representative from Essential Energy's Environmental Services will be notified. Works with the potential to disturb the site or object would not resume until the site or object had been properly identified, and appropriate action taken under the National Parks and Wildlife Regulation 2019 and NPW Act 1974 • If human remains are uncovered, works must immediately cease, and the NSW Police department and Essential Energy's Environmental Services team will be notified	During works
Non-Aboriginal Heritage	• All construction work would be undertaken within the assessed areas of the proposal site only • In the unlikely event that a previously unknown heritage site or archaeological 'relic' is located during construction of the proposal, works would cease immediately in that area and a representative from Essential Energy's Environmental Services would be notified. Works with the potential to disturb the find would not resume until the find had been properly identified, and appropriate action taken under the Heritage Act 1977	During works
Contamination	• It is intended to reuse surplus spoil beneficially on site • Essential Energy's CEOP8064 Management of Excavated Material; Guideline for Construction Sites will be consulted to determine the most appropriate beneficial reuse or disposal method for excavated materials • In the event of encountering any suspected contamination in the work area, it will be separated and contained on site until it can be classified in accordance with the EPA (2014) Waste Classification Guidelines, and then disposed of at a facility that is lawfully able to accept the waste • Control measures will be implemented to manage risks associated with the handling of fuel through using spill trays when undertaking in field re-fuelling	During works

Aspect	Environmental Mitigation Measures	Timing
	• Sediment and erosion control will be established and maintained in accordance with The Blue Book to minimise potential impacts on receiving watercourses	
Electric and Magnetic Fields	• The proposal will comply with all relevant national and international guidelines • Siting the location of the proposed new ZS away (approximately 200m) from sensitive residential receivers greatly minimises any potential residual EMF exposure risk	Project planning and design
Visual	• Siting the proposed new ZS away (approximately 200m) from sensitive residential receivers minimises potential views of the proposal from these receivers • ZS design to be predominantly indoor with the only external equipment being the transformers. Fencing combined with landscaping to be sympathetic to surrounds, whilst also providing the necessary security required for an electrical substation	Project planning and design
Waste	• All wastes that are generated because of the project will be classified in accordance with the Waste Classification Guidelines (EPA, 2014) • All waste material will be reused, recycled, or disposed of at a facility lawfully capable of receiving the waste	During works
Bushfire	• Ongoing vegetation maintenance would occur to ensure safe clearance distances are maintained for around the ZS perimeter	Post construction
Traffic and Access	• The need for a traffic management plan (TMP) for the construction phase would be determined and, if required, completed prior to works commencing. The TMP would outline requirements for the safe and continued use of local transport corridors during construction	Pre-works and during works
Land Use	• Consultation regarding the proposed works and schedule will be undertaken directly with potentially effected neighbours • The site should be left in a tidy condition at the conclusion of construction activities	During works
Social and Economic	• Management of construction traffic in the vicinity of construction works, including communication with effected residents, and road users • Signs and barriers would be erected around construction work sites, where appropriate, to minimise the possibility of personnel injuries and prevent placing the public at risk and provide site contact details during construction works	Pre-works and during works

7. Ecologically Sustainable Development

Ecologically sustainable development (ESD) is an attempt to provide the best outcomes for the human and natural environments both now and into the indefinite future. One of the most often cited definitions of sustainability is development that "meets the needs of the present without compromising the ability of future generations to meet their own needs". Sustainability relates to the continuity of economic, technical, social, institutional, and environmental aspects of human society, as well as the non-human environment.

The existing environment has been described throughout **Section 6** of this REF for the various aspects of the natural environment assessed as part of this proposed activity.

The proposal has been assessed against the following four principles of ESD listed in the *Protection of the Environment Administration Act 1991.*

The four principles of ESD are:

- The precautionary principle: section 6(2)(a)(i)(ii)
- The principle of inter-generational equity: section 6(2)(b)
- The principle of biological diversity and ecological integrity: section 6(2)(c)
- The principle of improved valuation of environmental resources: section 6(2)(d)(i)(ii)(iii).

An assessment of the proposal against the principles is provided below.

7.1 Precautionary Principle

The precautionary principle states that:

'If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

In the application of the precautionary principle, public and private decisions should be guided by:

1) *careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment; and*
2) *an assessment of the risk weighted consequence of various options.'*

For the precautionary principle to be applicable, two pre-conditions must be satisfied; "*first it is not necessary that serious or irreversible environmental damage has actually occurred – it is the threat of such damage that is required. Secondly, the environmental damage threatened must attain the threshold of being serious or irreversible*"[4].

If there is no threat of serious or irreversible environmental damage, there is no basis upon which the precautionary principle can apply.

Environmental investigations, including site based surveys completed for ecological, and Aboriginal heritage due diligence assessments, have been undertaken during the preparation of this REF to ensure that the potential environmental impacts are understood with a high degree of certainty. The spatial scale of impacts would be local and isolated to the immediate construction area. Therefore, it can be concluded that this proposal will not result in a threat of serious or irreversible damage.

Mitigation measures have also been proposed in this REF to minimise the identified potential impacts of the project. A Construction Environmental Management Plan (CEMP) will be developed and implemented as a precautionary measure, and no mitigation measures have been deferred due to a lack of scientific certainty. The proposal is therefore consistent with the precautionary principle.

7.2 Principle of Inter-Generational Equity

The principle of inter-generational equity states that:

'The present generation should ensure that the health, diversity and productivity of the environment

[4] Telstra Corporation Limited v Hornsby Shire Council [2006] NSWLEC 133, Preston CJ at 129

are maintained or enhanced for the benefit of future generations.'

To the extent possible, all environmental impacts and appropriate mitigation measures have been identified. The proposal would not harm the health, diversity, and productivity of the environment to such an extent that future generations would not be able to benefit.

The proposal is therefore consistent with the principle of inter-generational equity.

7.3 Principle of Biological Diversity and Ecological Integrity

The principle of biological diversity and ecological integrity states that:

'Conservation of biological diversity and ecological integrity should be a fundamental consideration.'

The proposal comprises the construction of a new 33kV ZS on previously cleared and benched land that remains predominately cleared aside limited regrowth with the benched access track remaining. An ecological assessment which has been prepared concluded there are not likely to be any significant impacts to threatened species or ecological communities as a result of the proposal. Impacts upon the ecological integrity would therefore be negligible, as described in **Section 6.5**.

7.4 Improved Valuation of Environmental Resources

The principle of improved valuation of environmental resources states that:

'Environmental factors should be included in the valuation of assets and services such as:

- Polluter pays – that is, those who generate pollution and waste should bear the cost of containment, avoidance and abatement.
- The users of goods and services should pay prices based on the full life cycle of costs of providing those goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.
- Environmental goals, having been established, should be pursued in the most cost-effective way, by establishing incentive structures, including market mechanisms that enable those best placed to maximise benefits or minimise cost to develop their own solutions and responses to environmental problems.'

The proposal has been designed taking into consideration the least possible impact on the environment. All costs associated with the containment, avoidance and abatement of pollution have been factored into the design of this proposal. The proposal will have the positive benefit of supporting the Sovereign Hills Estate and broader urban development, creating regional economic opportunities and job growth in the area.

8. Construction Environmental Management Plan

8.1 Introduction

A Construction Environmental Management Plan (CEMP) outlines the environmental objectives of a project, the environmental mitigation measures to be implemented, the timing of implementation, responsibilities for implementation and management, and a review process to determine the effectiveness of the strategies.

The construction contractor(s) would be required to develop a project-specific CEMP that addresses the scope of works to be undertaken. The CEMP would detail how the works would be undertaken to comply with all environmental laws, Essential Energy's environmental policy, and the environmental mitigation measures described in this REF.

The key objectives of the CEMP would include:

- Ensuring that the works are carried out in accordance with legislative requirements and relevant non-statutory policies.
- Ensuring that the works are carried out in accordance with the requirements detailed in this REF, including all requirements outlined in any relevant approvals, permits or licences and the mitigation measures described in **Section 6.**
- Ensuring that employees engaged to undertake the works comply with the conditions detailed in the CEMP.
- Identifying management responsibilities and reporting requirements to demonstrate compliance with the CEMP.

It is also noted that the CEMP would be a working document and may be amended over the duration of the project.

If a particular activity falls outside the scope of the REF and CEMP, and it would increase the environmental impact, the activity is not permitted to continue without an appropriate environmental assessment under the EP&A Act.

8.2 Implementation of the CEMP

The CEMP would be a working document and would be amended should strategies initially implemented be found to be inadequate to manage environmental impacts. The CEMP would typically:

- Establish environmental goals and objectives
- Detail the conditions of approval
- List actions, timing and responsibilities for implementation that arise from the mitigation measures recommended in this REF
- Detail statutory requirements
- Provide a framework for reporting on relevant matters on an ongoing basis
- Detail training requirements for personnel in environmental awareness and best practice environmental management systems
- Outline emergency procedures, including contact names and corrective actions
- Detail process surveillance and auditing procedures
- List complaint handling procedures
- Detail quality assurance procedures.

8.2.1 Auditing schedule of the CEMP

Auditing of the proposal would be undertaken to establish whether the contractor is conducting activities in accordance with their current environmental management plans and whether the management plans are providing an effective tool to control adverse environmental impacts.

The following activities are proposed to achieve the audit's purpose:

- Review the on-site implementation of the contractor's CEMP
- Review the documentation process to determine if planned works have received endorsement to proceed
- Monitor the compliance of construction activities with the project determination and environmental legislation
- Review the outcomes of any previous audit(s) and determine if there has been any change in the environmental performance of the construction contractor
- Identify opportunities to improve on-site environmental management practices.

The benefits of conducting the environmental audit are to allow:

- Feedback on the CEMP implementation process to assist both the contractor and project manager to improve the future preparation of site environmental management documentation
- Improve the planning of construction projects through documentation and impact assessment to ensure best environmental management practices are implemented on site
- Improve environmental management processes on site.

9. Environmental Checklist

In accordance with section 5.5 of the EP&A Act and clause 171 of the EP&A Reg, Essential Energy, when assessing the environmental impact of an activity on the environment, must consider the factors identified in **Table 9-1** and **Table 9-2** below.

Table 9-1: Section 5.5 requirements

Requirement	Section Reference
For the purpose of attaining the objects of this Act relating to the protection and enhancement of the environment, a determining authority in its consideration of an activity shall, notwithstanding any other provisions of this Act or the provisions of any other Act or of any instrument made under this or any other Act, examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity.	Section 2, 6, 7 and 8
Without limiting the above, a determining authority shall consider the effect of an activity on any wilderness area (within the meaning of the *Wilderness Act 1987*) in the locality in which the activity is intended to be carried on	N/A – there are no wilderness areas within or close to the activity area

Table 9-2: Clause 171 checklist

171 Factor	Section Reference
The environmental impact on a community *The works are located in a developing residential subdivision, and within what will be a new urban area. Impacts on the community have been considered by this REF. These include noise, dust, biodiversity, traffic, social and visual impacts. Except for noise, traffic and visual, these have been assessed to be low. Noise and visual impacts have been assessed as low to moderate, while traffic has been assessed as moderate to high, but only over the short term (i.e., during bulk earthworks).*	Sections 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11, 6.12, 6.13 6.14 and 6.15.
The transformation of a locality *In the short term there will be a high degree of visual change associated with site preparatory works, civil works, and construction of the ZS. Over the longer term the ZS will result in permanent change in the visual landscape, however, some degree of integration or merging of the SZ with the surrounding area will be achieved through specific design elements. These include neutral building design colours, complimentary palisade fencing and landscaping. While transformation of the locality will occur because of the Sovereign Hills Estate subdivision and the broader areas development, the contribution of the ZS to the areas transformation is not considered significant.*	Sections 6.10, 6.14 and 6.15
The environmental impact on the ecosystems of the locality *The proposal will not result in a significant impact on any threatened species, populations, threatened ecological communities, or their habitats within the subject site, and is not located on land mapped as outstanding biodiversity value. Being restricted to the relatively small proposal site, the proposal will not cause any additional impacts to threatened species, populations, and ecological communities beyond the proposal site from the construction, operation, and maintenance of the ZS.*	Sections 6.5 and 7.
Reduction of the aesthetic, recreational, scientific, or other environmental quality or value of a locality *An overall reduction in aesthetic and recreational quality of the locality is unlikely to occur during the proposal. Localised impacts may occur at the construction site; however these impacts will be temporary and of short duration, and can be managed through implementation of mitigation measures in this REF.* *Due to the relatively small footprint of the proposal and it not effecting the adjacent [to the south] proposed regional sporting fields, the long-term operation of the proposal will not reduce the aesthetic, recreational, or other environmental quality or value of the area with a locality.*	Sections 6.1, 6.2, 6.3, 6.4, 6.5, 6.6, 6.7, 6.8, 6.9, 6.10, 6.14, 6.15 and 6.16

171 Factor	Section Reference
The effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations. *No Aboriginal objects will be harmed by the proposal. A review of non-Aboriginal heritage databases, registers and LEPs indicated no sites of world, national, state, or local heritage were located at or within proximity to the proposal site.*	Sections 6.6, 6.7.
The impact on the habitat of protected fauna (within the meaning of the *Biodiversity Conservation Act, 2016*). *The proposed activity is not likely to significantly impact threatened fauna species.*	Section 6.5
The endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air. *It is not anticipated that the proposal will endanger any species of animal, plant, or other form of life, whether living on land, in water, or in the air.*	Section 6.5
Long-term effects on the environment. *Long-term adverse environmental effects are not anticipated.*	Sections 6 and 7
Degradation of the quality of the environment. *This risk is considered low with the implementation of soil and water management measures included in this REF.*	Sections 6.1, 6.2, 6.3, 6.5 and 6.8.
Risk to the safety of the environment. *There is the potential risk to the environment from spills of materials during construction of the proposal. Implementation of the mitigation measures contained in Section 6 of this REF will ensure that potential environmental risks are minimised.*	Sections 6.1, 6.2, 6.3, 6.8, 6.11, 6.12, 6.13, 6.14 and 7.
Reduction in the range of beneficial uses of the environment. *No long-term reduction in the range of beneficial uses of the environment is anticipated because of the proposal.*	Sections 6 and 7
Pollution of the environment. *Risk of pollution to the environment is considered low and can be managed with implementation of mitigation measures provided in this REF.*	Section 6
Environmental problems associated with the disposal of waste *Waste generated because of the proposed works will be minimal. All wastes that are generated because of the project will be appropriately disposed of in accordance with the Waste Classification Guidelines (EPA, 2014).*	Section 6.11
Increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply. *The proposal is unlikely to increase demands upon rare natural resources.*	Section 6
The cumulative environmental effect with other existing or likely future activities. *The proposal will be located within a developing urban area, specifically at the northern end of the approved Sovereign Hills Estate residential subdivision within a previously cleared and developed area. Surrounding remnant vegetation will not be impacted by the proposal. As such, any potential cumulative impacts to threatened species, populations and ecological communities from the construction, operation and maintenance of the ZS will be negligible to nil, and not likely to result in a significant impact.* *Similarly, given the relatively small disturbance footprint and the localised extent of potential impacts during construction and operational phases, the potential cumulative impact to other environmental factors during construction and operation of the ZS has been minimised to the greatest extent possible, and would not be significant. Any residual, minor impacts identified in this REF, can be mitigated and managed through the range of measures outlined in Section 6, and summarised in Table 6-5.*	Section 6.16
The impact on coastal processes and coastal hazards, including those under projected climate change conditions? *The proposal is not located within the identified coastal zone.*	Section 1 and 6.

171 Factor	Section Reference
Applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1, *The Port Macquarie population is forecast to grow by more than 1,000 people per year to around 104,000 people by 2036. PMHC adopted the Port Macquarie-Hastings Urban Growth Management Strategy 2017-2036 PMHC 2018) to plan and deliver growth and change, provide new housing and economic development, and inform the PMH LEP and the assessment of planning proposals and development applications. The SHZS and associated electricity network has been designed to support future development of Sovereign Hills and the surrounding area. The Sovereign Hills area is forecast to accommodate 7,000 residents by 2036 and also include commercial and industrial development.* *The State Environmental Planning Policy (Resources and Energy) 2021 applies to the proposal site, it being within a mapped future residential growth area. This SEPP facilitates the assessment and development of mining, petroleum production and extractive material resource proposals in NSW, to develop extractive resources by identifying land which contains extractive material of regional significance.* *The proposal supports residential or urban development of the area.*	Section 6.15
Other relevant environmental factors. *No other relevant environmental factors have been identified during the preparation of this REF*	N/A

10. Conclusion

This REF has been prepared to assess the environmental impacts associated with the construction, operation, and maintenance of the new SHZS. Essential Energy is a determining authority as defined in the *EP&A Act*. As such, the activity does not require consent under Part 4 of the *EP&A Act*. The activity has been assessed under Part 5, Division 5.1 of the EP&A Act.

The proposal, including the new SHZS, two new underground 33kV cables, and access road construction, would enable the upgrade of the local electricity network to both support the further development of Sovereign Hills Estate. and increase overall network capacity, placing Essential Energy in a better position to meet customers' future electricity needs.

The proposal complies with the provisions of section 5.5 of the *EP&A Act* and clause 171 of the *EP&A Reg* as shown in **Section 9**.

The proposal and its associated environmental impacts are unlikely to have a significant impact on the environment. The proposal would support Sovereign Hills Estate development and strengthen Essential Energy's electricity network in the broader Port Macquarie area, maximising the social and economic benefits, whilst minimising any adverse environmental impacts.

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Appendix A – Sovereign Hills Zone Substation preliminary concept design

CIVIL PLANS
FOR THE CONSTRUCTION OF
8031 - ESSENTIAL ENERGY ZONE
SUBSTATION SVH

THRUMSTER STREET
PORT MACQUARIE

8031-1001 DRAWING LIST		
DRAWING NUMBER / REFERENCE	TITLE	REVISION
8031-1001-001	LOCALITY PAGE, COVER PLAN AND DRAWING LIST	A
8031-1001-002	GENERAL NOTES	A
8031-1001-003	SITE LAYOUT PLAN	A
8031-1001-004	ROADS AND DRAINAGE LAYOUT PLAN	A
8031-1001-005	EARTHWORKS HEATMAP	A
8031-1001-006	PAVEMENT PLAN	A
8031-1001-007	ROAD 01 LONGITUDINAL SECTION	A
8031-1001-008	ROAD 01 CROSS SECTIONS 1 OF 3	A
8031-1001-009	ROAD 01 CROSS SECTIONS 2 OF 3	A
8031-1001-010	ROAD 01 CROSS SECTIONS 3 OF 3	A
8031-1001-011	DRAINAGE SCHEDULE, CALCULATIONS AND LONGITUDINAL SECTIONS	A
8031-1001-012	DRAINAGE CATCHMENT PLAN	A
8031-1001-013	WATER & SEWER LAYOUT	A
8031-1001-014	SEWER LONGITUDINAL SECTION	A
8031-1001-015	SEDIMENT & EROSION CONTROL	A

MGA

LOCALITY PLAN
SCALE 1:5000

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PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

0 50 100 200 300
Full Size 1:5000 ; Half Reduction 1:10000
SCALE (m)

Drawing Number/Reference		
8031-1001-001		
Designer: DG	Origin Of Levels: AHD	Rev.: A
Surveyor: RN	Height: 2.712	
Drafting: LR	Datum: AHD	Sheet Size: A1
Approved: DG	Scale: AS SHOWN	

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essential energy

Cad File: S:\Projects\8031 Essential\DWGS\CIVIL\8031-1001.dwg, Layout: 01, Plotted By: luke.robins, Date: 31/10/23 - 09:22,

GENERAL

- THIS PLAN IS TO BE READ IN CONJUNCTION WITH THE ENGINEERING PLANS, AND ANY OTHER PLANS OR WRITTEN INSTRUCTIONS THAT MAY BE ISSUED RELATING TO DEVELOPMENT OF THE SUBJECT SITE.
- DO NOT OBTAIN DIMENSIONS BY SCALING THE DRAWINGS.
- IN CASE OF DOUBT OR DISCREPANCY REFER TO SUPERINTENDENT FOR CLARIFICATION OR CONFIRMATION PRIOR TO THE COMMENCEMENT OF CONSTRUCTION.
- WHERE NEW WORKS ABUT EXISTING THE CONTRACTOR SHALL ENSURE THAT A SMOOTH EVEN PROFILE, FREE FROM ABRUPT CHANGES IS OBTAINED.
- MAKE SMOOTH TRANSITION TO EXISTING FEATURES AND MAKE GOOD WHERE JOINED.
- THESE PLANS SHALL BE READ IN CONJUNCTION WITH ALL APPROVED DRAWINGS AND SPECIFICATIONS PREPARED BY OTHER PROJECT CONSULTANTS.
- IT IS THE CONTRACTORS RESPONSIBILITY TO ASCERTAIN IN THE FIELD THE LOCATION AND LEVEL OF ALL EXISTING SERVICES (TELSTRA, UNDERGROUND POWER, SEWER, WATER, ETC.) AND ANY OTHER FEATURE OR STRUCTURE LIKELY TO BE AFFECTED BY THE WORKS AND TO TAKE APPROPRIATE MEASURES TO ENSURE NO DAMAGE THERETO. ANY DAMAGE SHALL BE MADE GOOD AT NO COST TO THE PROPRIETOR.
- LOCATION OF ALL DRAINAGE LINES WITHIN EASEMENTS TO BE FIXED AND VERIFIED BY SUPERINTENDENT PRIOR TO CONSTRUCTION.
- SUBSOIL DRAINAGE IS GENERALLY REQUIRED WHERE DEPTH TO ROAD SUBGRADE FROM NATURAL SURFACE IS 400mm OR MORE. INSTALL A 3m LENGTH OF SUBSOIL DRAIN ON THE UPSTREAM SIDE OF ALL DRAINAGE PITS WITH AN UPSTREAM PIPE.
- SURFACE CUT-OFF DRAINS, AND OTHER MEASURES AS REQUIRED, TO BE CONSTRUCTED FOR EROSION AND SILTATION CONTROL PRIOR TO COMMENCEMENT OF EARTHWORKS, SUCH MEASURES TO BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION PERIOD.
- STREET LIGHTING TO COMPLY WITH SPECIFICATION OF PUBLIC LIGHTING CODE (AS1158)
- PROVIDE 900mm OF TURF BEHIND KERB AND GUTTER.
- ALL WORKS IN ACCORDANCE WITH AUS-SPEC No.1 PORT MACQUARIE HASTINGS COUNCIL VERSION 2003 EDITION.
- ALL WORKS WITHIN ROAD RESERVE TO BE CARRIED OUT BY A COUNCIL REGISTERED C0NTRACTOR
- TRAFFIC CONTROL TO AS1742.3
- CONTRACTOR TO TAKE APPROPRIATE DUST SUPPRESSION MEASURES AS NECESSARY TO PREVENT DISTURBANCE TO ADJOINING RESIDENCES.
- ALL FILLING WORKS SHALL BE CONTROLLED FILL AS DEFINED IN AS2870 AND AS3780
- TRAFFIC MANAGEMENT PLAN BY CONTRACTOR IN ACCORDANCE WITH AS1742.3

EXISTING SERVICES

- ALL UTILITY SERVICES INDICATED ON THE DRAWINGS ORIGINATE FROM SUPPLIED DATA, THEREFORE THEIR ACCURACY AND COMPLETENESS IS NOT GUARANTEED. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO DETERMINE AND CONFIRM THE LOCATION AND LEVEL OF ALL EXISTING SERVICES PRIOR TO THE COMMENCEMENT OF ANY WORK. ANY DISCREPANCIES SHALL BE REPORTED TO THE SUPERINTENDENT. CLEARANCES SHALL BE OBTAINED FROM THE RELEVANT SERVICE AUTHORITY.
- CARE TO BE TAKEN WHEN EXCAVATING NEAR EXISTING SERVICES. NO MECHANICAL EXCAVATIONS ARE TO BE UNDERTAKEN OVER COMMUNICATION, GAS OR ELECTRICAL SERVICES. HAND EXCAVATION ONLY IN THESE AREAS.
- THE CONTRACTOR SHALL PROTECT AND MAINTAIN ALL EXISTING SERVICES THAT ARE TO BE RETAINED IN THE VICINITY OF THE PROPOSED WORKS. ANY AND ALL DAMAGE TO THESE SERVICES AS A RESULT OF THESE WORKS SHALL BE REPAIRED BY THE CONTRACTOR UNDER THE DIRECTION OF THE SUPERINTENDENT, AND AT NO EXTRA COST.
- THE CONTRACTOR SHALL ALLOW IN THE PROGRAM FOR ADJUSTMENT (IF REQUIRED) OF EXISTING SERVICES IN AREAS AFFECTED BY WORKS.
- THE CONTRACTOR SHALL ALLOW IN THE PROGRAM FOR THE CAPPING OFF, EXCAVATION AND REMOVAL (IF REQUIRED) OF EXISTING SERVICES IN AREA AFFECTED BY WORKS UNLESS DIRECTED OTHERWISE ON THE DRAWINGS OR BY THE SUPERINTENDENT.
- THE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES SERVICES TO ALL BUILDINGS NOT AFFECTED BY THE WORKS ARE NOT DISRUPTED.
- PRIOR TO COMMENCEMENT OF ANY WORKS THE CONTRACTOR SHALL GAIN APPROVAL OF THE PROGRAM FOR THE RELOCATION AND/OR CONSTRUCTION OF TEMPORARY SERVICES AND FOR ANY ASSOCIATED INTERRUPTION OF SUPPLY.
- THE CONTRACTOR SHALL CONSTRUCT TEMPORARY SERVICES TO MAINTAIN EXISTING SUPPLY TO BUILDINGS REMAINING IN OPERATION DURING WORKS TO THE SATISFACTION AND APPROVAL OF THE SUPERINTENDENT. ONCE DIVERSION IS COMPLETE AND COMMISSIONED THE CONTRACTOR SHALL REMOVE ALL SUCH TEMPORARY SERVICES AND MAKE GOOD TO THE SATISFACTION OF THE SUPERINTENDENT.

ACCESS & SAFETY

THE CONTRACTOR SHALL COMPLY WITH ALL STATUTORY AND INDUSTRIAL REQUIREMENTS FOR PROVISION OF A SAFE WORKING ENVIRONMENT INCLUDING TRAFFIC CONTROL.

- THE CONTRACTOR SHALL ENSURE THAT AT ALL TIMES ACCESS TO ALL BUILDINGS ADJACENT THE WORKS IS NOT DISRUPTED.
- WHERE NECESSARY THE CONTRACTOR SHALL PROVIDE SAFE PASSAGE OF VEHICLES AND/OR PEDESTRIANS THROUGH OR BY THE SITE.

ACID SULPHATE SOIL (ASS) TESTING

- IMPORTED FILL IS TO BE TESTED FOR POTENTIAL ACID SULPHATE AND ALL TESTING IS TO BE CARRIED OUT BY NATA LAB.
- WHERE POTENTIAL ASS IS DETECTED NEUTRALISATION IS REQUIRED USING LIME MIXED THOROUGHLY WITH THE IMPORTED FILL IN ACCORDANCE WITH AUS-SPEC 2003.
- TEST AGENCY TO CONFIRM QUANTITY OF LIME IN kg/cubic m
- ALL LEACHATE TO BE CONTROLLED AND PREVENTED FROM ENTERING NATURAL WATERWAYS

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EROSION CONTROL NOTES

- EROSION AND SEDIMENT CONTROL TO BE IN ACCORDANCE WITH BLUE BOOK
- NO DISTURBED AREA IS TO REMAIN DENUDED LONGER THAN 60 DAYS.
- ALL EROSION AND SILTATION CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN GRADING.
- ALL STORMWATER AND SEWER LINES NOT IN STREETS ARE TO BE MULCHED AND SEEDED WITHIN 15 DAYS AFTER BACKFILL. ELECTRIC POWER, TELEPHONE AND GAS SUPPLY TRENCHES ARE TO BE COMPACTED, SEEDED AND MULCHED WITHIN 15 DAYS AFTER BACKFILL.
- ALL TEMPORARY EARTH BANKS, DIVERSIONS AND SEDIMENT DAM EMBANKMENTS ARE TO BE MACHINE-COMPACTED, SEEDED AND MULCHED FOR TEMPORARY VEGETATIVE COVER WITHIN 10 DAYS AFTER GRADING. STRAW OR HAY MULCH IS REQUIRED.
- ALL FILLS ARE TO BE LEFT WITH A LIP AT THE TOP OF THE SLOPE AT THE END OF EACH DAYS OPERATION.
- ALL CUT AND FILL SLOPES ARE TO BE SEEDED AND MULCHED WITHIN 10 DAYS OF COMPLETION OF GRADING.
- ALL DISTURBED AREAS TO BE STABILISED AND/OR REVEGETATED WITHIN 14 DAYS OF EARTHWORKS COMPLETION, USING TURF OR THE FOLLOWING SEED AND FERTILISER MIXTURE:

	SPRING/SUMMER	AUTUMN/WINTER
JAPANESE MILLET	15kg/ha	5kg/ha
RYECORN/OATS	5kg/ha	15kg/ha
COUCH GRASS	10kg/ha	8kg/ha
PERENNIAL RYEGRASS	5kg/ha	10kg/ha
STARTER FERTILISER (SOWING)	300kg/ha	300kg/ha
MAINTENANCE FERTILISER (FOLLOWING SPRING/AUTUMN)	100kg/ha	100kg/ha

SITE REGRADING GENERALLY

- SITE REGRADING AREAS AS PER SPECIFICATION.
- TOPSOIL TO BE STRIPPED, STOCKPILED AND TO BE USED ON SITE AS DIRECTED. NO TOPSOIL TO BE REMOVED FROM SITE.
- CUT AND FILL SITE, COMPACTING FILL TO ACHIEVE A RELATIVE DENSITY OF AT LEAST 98% OF STANDARD COMPACTION. (A.S. 1289 TEST E1.1)
- ENSURE EROSION CONTROL AND FILTER FENCES MAINTAINED AT ALL TIMES.
- SUBSOIL DRAINAGE REQUIREMENTS ARE TO BE VERIFIED WITH THE GEOTECHNICAL ENGINEER PRIOR TO FILLING WORK COMMENCING.
- ON COMPLETION OF ALL FILLING, THE CONTRACTOR IS TO ARRANGE AT HIS COST A GEOTECHNICAL REPORT BY A QUALIFIED ENGINEER.
- ALL FILLING SHALL BE CARRIED OUT AS CONTROLLED FILL AS DEFINED IN AS2870 & AS3780

SITE REGRADING TO BUILDING PADS

- TOPSOIL TO BE STRIPPED, STOCKPILED AND TO BE USED ON SITE AS DIRECTED. NO TOPSOIL TO BE REMOVED FROM SITE.
- BUILDING EARTHWORKS TO BE CARRIED OUT IN ACCORDANCE WITH AS3798
- ALL FILLING SHALL BE CARRIED OUT AS "CONTROLLED FILL" AS DEFINED IN AS2870. MATERIAL THAT HAS BEEN PLACED AND COMPACTED IN LAYERS BY COMPACTION EQUIPMENT WITHIN A DEFINED MOISTURE RANGE TO A DEFINED DENSITY REQUIREMENT IN ACCORDANCE WITH AUS-SPEC (98% COMPACTION UNLESS SPECIFIED OTHERWISE - AS1289 TEST E1.1).
- RAFT SLABS, AS FOR CLASS M SITE CAN PROVIDE A SUITABLE FOUNDATION SO LONG AS THE FOLLOWING SITE PREPARATION IS UNDERTAKEN:-
  - a) STRIP TOPSOIL (150mm) FROM CUT AND FILL AREAS.
  - b) STRIP A FURTHER 400mm THICKNESS FROM AREAS TO BE FILLED. STOCKPILE FOR REUSE AS FILL.
  - c) BENCH FILL AREA TO ALLOW FILL TO BE PLACED IN RELATIVELY HORIZONTAL LAYERS (OF NO MORE THAN 200mm LOOSE THICKNESS.)
  - d) CUT AND FILL SITE, COMPACTING FILL TO ACHIEVE A RELATIVE DENSITY OF AT LEAST 98% OF STANDARD COMPACTION (A.S. 1289 TEST E1.1)
  - e) WHERE CUT DEPTH IS LESS THAN 900mm, OVER EXCAVATE T0 REMOVE MATERIAL DOWN TO 200mm BELOW DESIGN SURFACE AND REPLACE IN COMPACTED LAYERS TO ACHIEVE THE ABOVE COMPACTION.
- IN ALL BUILDING WORKS ADEQUATE DRAINAGE SHALL BE PROVIDED AROUND THE UPHILL SIDES OF THE BUILDING.
- SUBSOIL DRAINAGE REQUIREMENTS ARE TO BE VERIFIED WITH THE GEOTECHNICAL ENGINEER PRIOR TO FILLING WORK COMMENCING
- ON COMPLETION OF ALL FILLING, THE CONTRACTOR IS TO ARRANGE AT HIS COST A GEOTECHNICAL REPORT BY A QUALIFIED ENGINEER.
- ENSURE EROSION CONTROL AND FILTER FENCES MAINTAINED AT ALL TIMES.
- TOLERANCES - EARTHWORKS TOLERANCES TO BUILDING PADS SHALL BE ±50mm.

FILLING & COMPACTION NOTES

- STRIP SURFACE OF TOPSOIL AND ORGANIC MATERIAL TO A MINIMUM DEPTH OF 150mm.
- FILL AND COMPACT IN LAYERS NOT EXCEEDING 200mm AND COMPACT TO 98%SDD.
- PROVIDE COMPACTION TESTING FOR EVERY SECOND LAYER OR AS DIRECTED BY SUPERINTENDENT.
- USE ONLY SELECTED FILL, FREE OF ORGANIC MATERIAL, ROOTS & TIMBER. SELECTED FILL TO BE APPROVED BY SUPERINTENDENT.

STORMWATER DRAINAGE NOTES

- ALL DRAINAGE STRUCTURES TO BE CONSTRUCTED IN ACCORDANCE WITH AUS-SPEC, HASTINGS COUNCIL VERSION 2003 EDITION.
- PRECAST PITS ARE NOT APPROVED FOR USE IN ROAD RESERVE AND ARE ONLY PERMITTED FOR USE IN NON TRAFFICABLE INTERALLOTMENT LOCATIONS.
- CONCRETE TO BE 25 MPa, 80 SLUMP.
- ALL PIPES TO BE RUBBER RING JOINTED.
- CLASS SN8 POLYPROPYLENE PIPE, (STORMPRO, BLACKMAX OR EQUIVALENT), MAY BE SUBSTITUTED FOR RCP FOR ≤ 600mm DIAMETER. THE CONTRACTOR SHALL PROVIDE WAE DETAILS - LINE SHEETS TO CONFIRM MATERIALS USED.
- THE CONTRACTOR SHALL ENSURE THAT ACCESS TO PRIVATE PROPERTY IS MAINTAINED AT ALL TIMES.
- ANY CHANGE TO PUBLIC UTILITIES OR ROADWORKS IS THE RESPONSIBILITY OF THE CONTRACTOR.
- THE CONTRACTOR SHALL LOCATE, AT NO ADDITIONAL COST TO THE OWNER, ALL UTILITIES AND SERVICES PRIOR TO EXCAVATION.
- COMPRESSIVE STRENGTH F'c FOR CAST IN SITU CONCRETE TO BE A MINIMUM OF 20MPa AT 28 DAYS
- ALL DIMENSIONS ARE IN MILLIMETRES
- PROVIDE F82 MESH CENTRALLY PLACED TO WALLS OF PITS > 1.5m DEEP. 50mm MIN. COVER RETURN MESH 300mm INTO BASE AND SIDES
- ALL STEEL WORK SHALL BE HOT DIP GALVANISED IN ACCORDANCE WITH AS 1650
- EXPANSION JOINTS TO BE 15mm WIDE FOR FULL DEPTH OF KERB & GUTTER, WITH JOINT BEING OF A PREFORMED MATERIAL OF BITUMINOUS FIBREBOARD
- MAX DEPTH PIT 3500mm
- PROVIDE MIN. 50mm DROP THROUGH PIT.

WATERMAIN NOTES

- DESIGN AND CONSTRUCTION WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH AUS-SPEC DEVELOPMENT DESIGN SPECIFICATION D11 - WATER RETICULATION & DEVELOPMENT CONSTRUCTION SPECIFICATION C401 - WATER RETICULATION.
- PIPES IN ROAD PAVEMENTS ARE TO BE CEMENT LINED PN35 OR K9 DUCTILE IRON TO AS 2280, WRAPPED WITH POLYETHYLENE SLEEVING - REFER TO ASD 401.
- PIPES IN FOOTPATH AREAS ARE TO BE PVC-U, PVC-O OR PVC-M CLASS 12 TO AS 4020, AS 1477 SERIES 2, AS 4765 & AS 4441 AS APPROPRIATE, UNLESS SHOWN OTHERWISE ON THE PLANS - REFER TO ASD 402.
- ALL MAINS ARE TO BE LAID 1.0m BEHIND THE KERB UNLESS OTHERWISE SHOWN ON THE PLANS.
- LOT CORNERS ARE TO BE MARKED BY THE SUPERVISING CONSULTANT TO ENSURE CORRECT LOCATION OF SERVICES.
- MINIMUM COVER IN FOOTPATH AREAS IS 450mm AND UNDER ROAD PAVEMENT AREAS IS TO BE 600mm.
- ALL PIPES ARE TO BE LAID WITH CONTINUOUS 200mm PLASTIC MESH WITH COPPER OR STAINLESS STEEL TRACE FOR RADIO LOCATION.
- ALL FITTINGS ARE TO BE CEMENT LINED DUCTILE IRON TO AS 2280 AND WRAPPED WITH POLYETHYLENE SLEEVING OR POWDER COATED.
- ALL BENDS, TEES, END CAPS, TAPERS AND VALVES ARE TO BE ANCHORED WITH THRUST BLOCKS - REFER TO ASD 432.
- HYDRANT FITTINGS CONSIST OF A HYDRANT TEE WITH SPRING HYDRANT TO A.S.3952 AND SPACERS AS APPROPRIATE. HYDRANT FITTINGS ARE TO BE POWDER COATED - REFER TO ASD 440.
- STOP VALVES ARE TO BE RESILIENT SEATED AND POWDER COATED AND MANUFACTURED TO A.S.2638. STOP VALVES SHALL BE CLOCKWISE CLOSING - REFER TO ASD 441.
- VALVE AND HYDRANT COVERS ARE TO BE RL430 HV PITS AVAILABLE FROM AUSTRALIAN POWER.
- MARKINGS ARE TO BE IN ACCORDANCE WITH ASD 460, ASD 461 & ASD 462.
- SERVICE CONNECTIONS ARE TO BE IN ACCORDANCE WITH ASD 450, ASD 451 & ASD 452. (20mm COPPER)
- WHEREVER THERE IS A PAVEMENT OVER A WATER MAIN SERVICE TAPPING, A CAST IRON PATH BOX (OR APPROVED EQUIVALENT) WILL BE REQUIRED.
- CONNECTION TO, ADJUSTMENT OF, OR RELOCATION OF, EXISTING MAINS ARE TO BE ARRANGED WITH COUNCIL AT CONTRACTORS COST.
- WATER MAINS ARE TO BE DISINFECTED IN ACCORDANCE WITH DPW&S STANDARD PROCEDURES PRIOR TO BEING COMMISSIONED.

FOR POLYETHYLENE PIPES ...

- WORK IS TO BE CARRIED OUT IN ACCORDANCE WITH THE POLYETHYLENE PIPE CODE WSA 01-1998 BY A CONTRACTOR TRAINED AND ACCREDITED IN POLYETHYLENE PIPE INSTALLATION.
- POLYETHYLENE PIPES ARE TO BE TO AS4130, TYPE 80B MATERIAL, PRESSURE CLASS PN 16 AND BLUE STRIPED BLACK PIPE.
- POLYETHYLENE PIPE FITTINGS ARE TO BE COMPRESSION OR ELECTROFUSION FITTINGS TO AS4129(INT), TYPE 80B MATERIAL, PRESSURE CLASS PN 16 AND BLUE OR BLACK IN COLOUR.
- ALL PIPES SHALL BE EXAMINED FOR SURFACE DAMAGE IMMEDIATELY BEFORE INSTALLATION. PIPES WITH SCORES OR SCRATCHES DEEPER THAN 10% OF THE WALL THICKNESS SHALL BE REJECTED. WHERE POSSIBLE, A SINGLE LENGTH OF PIPE IS TO BE USED.
- ONLY PIPE MANUFACTURER SPECIFIED TOOLS AND MATERIALS ARE TO BE USED DURING THE JOINTING OPERATION.
- POLYETHYLENE PIPES SHALL NOT BE CURVED TO A RADIUS LESS THAN 25 TIMES PIPE OUTSIDE DIAMETER.

SEWER NOTES

- THE CONTRACTOR SHALL PROVIDE AND KEEP UP TO DATE AT ALL TIMES A SET OF DRAWINGS MARKED IN SUCH MANNER TO SHOW "WORK AS EXECUTED". THESE DRAWINGS ARE TO BE RETURNED TO THE ENGINEER/SURVEYOR ON COMPLETION OF CONTRACT.
- ONE JUNCTION IS TO BE INSTALLED FOR EACH LOT AS SHOWN BY THE ARROWS. THE JUNCTION IS TO BE INSTALLED AT THE PIPE JOINT NEAREST TO THE LOCATION SHOWN BY THE ARROW. THE FINAL POSITIONS OF ALL JUNCTIONS, SHOWING DISTANCES TO D.S. MANHOLES ARE TO MARKED ON "WORK AS EXECUTED" DRAWINGS BY THE CONTRACTOR.
- JUNCTION POSITION TO BE INDICATED BY 75mm X 50mm HARDWOOD STAKE PAINTED ENTIRELY IN RED OIL POINT AND MARKED WITH CHISELED 'J'.
- MANHOLE NUMBERS ARE TO BE PAINTED ON EACH LID BY THE CONTRACTOR IN ACCORDANCE WITH COUNCIL'S STANDARD REQUIREMENT.
- PIPE TYPES TO BE u.P.V.C. CLASS S.E.H. OR ULTRA RIB CLASS SEH FOR LINES GREATER THAN 3 METRES DEPTH AND u.P.V.C. CLASS S.H. FOR LINES LESS THAN 3 METRES DEPTH. ALL PIPES IN WATER CHARGED GROUND TO BE V.C.P. ALL PIPES TO BE RUBBER RING JOINTED.
- STEP IRONS TO BE PROVIDED TO MANHOLES DEEPER THAN 1.2 TO BENCHING.
- TRENCH STOPS TO BE PROVIDED ON ALL SEWER LINES WHERE GRADES EXCEED 10% OR WHERE DIRECTED.
- ALL TRENCHES IN EXCESS OF 1.5M DEEP ARE TO BE BENCHED OR SHORED TO THE SATISFACTION OF SUPERINTENDENT.
- TYPE 'D' CEMENT TO BE USED ON ALL SEWER WORKS.
- DESIGN AND CONSTRUCTION TO BE IN ACCORDANCE WITH AUS-SPECDEVELOPMENT SPECIFICATION SERIES NoS D12 & C402.
- CONNECTION TO HASTINGS COUNCIL SEWER SYSTEM TO BE CARRIED OUT UNDER COUNCIL'S SUPERVISION.
- SIDELINES ARE TO BE 150mm EXTENSIONS CONSTRUCTED OFF AND AT THE LEVEL OF THE SEWERMAIN.

WORK AS EXECUTED INFORMATION

ALL RELEVANT WORK AS EXECUTED INFORMATION AS REQUIRED BY PORT MACQUARIE HASTINGS COUNCIL IS TO BE FORWARDED TO THE SUPERVISING CONSULTANT BY THE CONTRACTOR, INCLUDING;

SEWER

- A MARKER IS TO BE PLACED DIRECTLY ABOVE ALL SEWER DEAD ENDS INDICATING THE DEPTH OF THE PIPE INVERT FROM THE FINISHED SURFACE LEVEL.
- LENGTH AND ANGLE OF SIDELINES IS TO BE NOTED
- USE OF A RISER IS TO BE NOTED

SEWER RISING MAINS

- MARKER IS TO BE PLACED DIRECTLY ABOVE ALL BURIED FITTINGS, (BENDS, ELBOWS ETC) INDICATING THE FITTING TYPE AND THE RL OF THE TOP OF THE PIPE, OR THE DEPTH FROM THE FINISHED SURFACE LEVEL TO THE TOP OF MAIN.

WATERMAIN

- A MARKER IS TO BE PLACED DIRECTLY ABOVE ALL BURIED FITTINGS, (BENDS, ELBOWS ETC) INDICATING THE FITTING TYPE AND THE RL OF THE TOP OF THE PIPE, OR THE DEPTH FROM THE FINISHED SURFACE LEVEL TO THE TOP OF MAIN.
- A MARKER IS TO BE PLACED DIRECTLY ABOVE THE END OF HOUSE SERVICE CONNECTIONS INDICATING DEPTH TO PIPE FROM THE FINISHED SURFACE LEVEL.
- ALTERNATIVELY, A MARKED UP PLAN INDICATING THE LENGTH OF PIPE BETWEEN ALL FITTINGS, OFFSET DISTANCE OF PIPE TO KERB OR BDY, SMH, DRAINAGE PIT OR ANY OBJECT THAT CAN HELP LOCATE THE PIPE IN THE FUTURE,TYPE OF FITTING USED, TYPE OF PIPE USED, AND AN AVERAGE DEPTH OF THE PIPE.

DRAINAGE

- A MARKER TO BE PLACED DIRECTLY ABOVE ANY DEAD END (INTERALOTMENT INCLUDED) INDICATING DEPTH TO THE PIPE INVERT FROM THE FINISHED SURFACE LEVEL.

PAVEMENT DESIGN

- ROAD PAVEMENT DESIGN BASED ON REGIONAL GEOTECHNICAL SOLUTIONS ASSESSMENT - *************.
- ROAD PAVEMENT DESIGN SUBJECT TO GEOTECHNICAL ASSESSMENT. DO NOT SCALE PAVEMENT THICKNESS FROM DRAWINGS.
- ALL PAVEMENT MATERIALS SHALL COMPLY WITH CURRENT RTA SPECIFICATIONS. PROVIDE MECHANICAL ANALYSIS FOR EACH BATCH OF PAVEMENT MATERIAL TO ENSURE CONFORMITY.
- COMPACTION STANDARDS AS FOLLOWS & IN ACCORDANCE WITH A.S. 1289:
  - a) BASE - 98% MODIFIED MAXIMUM DRY DENSITY
  - b) SUBBASE - 95% MODIFIED MAXIMUM DRY DENSITY
  - c) SELECT AND UPPER 300mm OF SUBGRADE - 100% STANDARD MAXIMUM DRY DENSITY
  - d) SUBGRADE (FILL BELOW UPPER 300mm) - 100% STANDARD MAXIMUM DRY DENSITY
- THE CONTRACTOR SHALL CONFIRM THE DESIGN CBR WITH A MINIMUM OF 3 TESTS TAKEN AT SUBGRADE LEVEL. WHERE DISCREPANCY IS FOUND, CONTACT THE DESIGNING ENGINEER.
- ALLOW FOR COMPACTION TESTING BY NATA REGISTERED LABORATORY FOR: BASE LAYER, SUBBASE LAYER, SUBGRADE IN ACCORDANCE WITH AUSPEC, (MINIMUM 2 TESTS PER LAYER). ALLOW FOR AT LEAST TWO SUCCESSFUL COMPACTION TESTS IN EACH LAYER.
- MATCH NEW PAVEMENTS NEATLY AND FLUSH WITH EXISTING WHERE REQUIRED.

ASPHALTIC CONCRETE NOTES

1. GENERAL

- ALL ASPHALTIC CONCRETE (AC) WORK TO BE PREPARED AND CARRIED OUT IN ACCORDANCE WITH GOOD ASPHALTIC PAVING PRACTICE AS DESCRIBED IN AS2734-1994 "ASPHALT (HOT-MIXED) PAVING - GUIDE TO GOOD PRACTICE" AND CURRENT RTA SPECIFICATIONS.
- DO NOT STORE PLANT EQUIPMENT OR TRAFFIC NEWLY LAID ASPHALTIC CONCRETE PAVEMENTS WITHOUT PRIOR APPROVAL FROM THE ENGINEER.
- DO NOT APPLY MARKING PAINTS UNTIL ASPHALT HAS CURED IN ACCORDANCE WITH PAINT MANUFACTURER'S SPECIFICATIONS.

2. PAVEMENT PREPARATION

- THE EXISTING SURFACE TO BE SEALED SHALL BE WITHIN +/- 2% OF THE OPTIMUM AND BROOMED BEFORE COMMENCEMENT OF WORK TO ENSURE COMPLETE REMOVAL OF ALL SUPERFICIAL FOREIGN MATTER.
- PRIME ALL SURFACES TO BE SEALED. ALLOW PRIME TO SETTLE FOR A MINIMUM OF 3 DAYS BEFORE APPLYING TACK COAT AND ASPHALT.
- SWEEP PRIMED SURFACES BEFORE APPLYING TACK COAT.
- ALL DEPRESSIONS OR UNEVEN AREAS ARE TO BE TACK-COATED AND BROUGHT UP TO GENERAL LEVEL OF PAVEMENT WITH ASPHALTIC CONCRETE BEFORE LAYING OF MAIN COURSE.
- ALL DEFECTS IN THE BASE COURSE INCLUDING CRACKS, SURFACE DEFORMATION AND THE LIKE SHALL BE REPAIRED AS DIRECTED BY THE SUPERINTENDENT PRIOR TO PLACEMENT OF TACK COAT AND/OR AC COURSES.

3. JOINTS

- THE NUMBER OF JOINTS BOTH LONGITUDINAL AND TRANSVERSE SHALL BE KEPT TO A MINIMUM.
- THE DENSITY AND SURFACE FINISH AT JOINTS SHALL BE SIMILAR TO THOSE OF THE REMAINDER OF THE LAYER.

4. COMPACTION

- ALL COMPACTION SHALL BE UNDERTAKEN USING SELF PROPELLED ROLLERS.
- INITIAL ROLLING SHALL BE COMPLETED BEFORE THE MIX TEMPERATURE FALLS BELOW 105°C USING A STEEL DRUM ROLLER HAVING A MINIMUM WEIGHT OF 8 TONNES AND A MAXIMUM UNIT LOAD ON THE REAR DRUM EQUIVALENT TO 55kN/m WIDTH OF DRUM.
- SECONDARY ROLLING SHALL BE COMPLETED BEFORE THE MIX TEMPERATURE FALLS BELOW 80°C USING A PNEUMATIC TYRED ROLLER OF AT LEAST 10 TONNES MASS, A MINIMUM TYRE PRESSURE OF 550kPa AND A MINIMUM TOTAL LOAD OF 1 TONNE ON EACH TYRE.
- ROLLED SURFACES SHALL BE SMOOTH AND FREE OF UNDULATIONS. BONY AND UNEVEN SURFACES WILL BE REJECTED.
- PROVIDE 2 No. MINIMUM COMPACTION TESTS PER PAVING RUN.

5. FINISHED SURFACE PROPERTIES

FINISHED SURFACES SHALL BE SMOOTH, DENSE AND TRUE TO SHAPE AND:

- 3mm FROM THE SPECIFIED PLAN LEVEL AT ANY POINT.
- 3mm FROM THE BOTTOM OF A 3m STRAIGHT EDGE LAID TRANSVERSELY.
- 5mm FROM THE BOTTOM OF A 3m STRAIGHT EDGE LAID LONGITUDINALLY.
- MINUS 0 TO PLUS 2mm ADJACENT TO OTHER ELEMENTS SUCH AS KERBS AND THE LIKE TO AVOID POOLING OF SURFACE WATER.
- MINUS 0 FROM THE SPECIFIED THICKNESS.

CONSTRUCTION REQUIREMENTS

- THE DEVELOPERS CONTRACTOR SHALL PROVIDE ALL EXCAVATION AND BACKFILLING NECESSARY TO ACCOMMODATE THE INSTALLATION OF ALL GAS PIPES, ELECTRICAL PLANT, AND TELECOMMUNICATIONS PLANT, TO THE SATISFACTION OF THE RELEVANT UTILITY.
- ALL BEDDING AND BACKFILLING OPERATIONS, AND MATERIALS ARE TO SUIT THE RELEVANT AUTHORITIES/UTILITIES SPECIFICATIONS.
- THE DEVELOPERS CONTRACTOR IS TO FINALISE THE VERGE PROFILE PRIOR TO TRENCHING TO ENSURE THE CORRECT DEPTH OF COVER TO UTILITIES PLAN, AND PROVIDE FINISHED SURFACE LEVELS ON SURVEY STAKES AT PRE-DETERMINED PIT LOCATIONS AS REQUIRED.
- TRENCH DEPTHS AND WIDTHS SHALL DEPEND ON SPECIFIED UTILITY REQUIREMENTS. TO BE CONFIRMED PRIOR TO CONSTRUCTION.
- MANDATORY SEPARATION OF 150 MM BETWEEN GAS AND PROTECTED L.V. & H.V. CABLES IS TO BE MAINTAINED AT ALL TIMES. (WHERE GAS MAIN IS 75 MM IN DIAMETER OR LESS.)
- MANDATORY SEPARATION OF 150 MM BETWEEN TELECOMMUNICATIONS AND SMALL GAS MAINS (75 MM OR LESS), AND 300 MM BETWEEN TELECOMMUNICATIONS AND LARGE GAS MAINS (LARGER THAN 75 MM), IS TO BE MAINTAINED AT ALL TIMES.
- MANDATORY SEPARATION OF 100 MM BETWEEN TELECOMMUNICATIONS AND L.V. CABLES, AND 300 MM BETWEEN TELECOMMUNICATIONS AND H.V. CABLES, IS TO BE MAINTAINED AT ALL TIMES. A PROTECTIVE COVER IS TO BE INSTALLED OVER ELECTRICAL CABLES AT ALL TIMES.
- ALL ELECTRICAL SURFACE STRUCTURES AND TELECOMMUNICATION PITS ARE TO BE OFFSET/INSTALLED AS DETAILED.
- THE NATURAL GAS SERVICE LAYER IS TO ENSURE THAT ALL MAINS ARE INSTALLED IN THE CENTRE OF THE TRENCH, AS DETAILED ABOVE. THE SERVICE LAYER IS TO AVOID THE EXCESSIVE SNAKING OF SMALL GAS MAINS.
- THE DEVELOPERS CONTRACTOR SHOULD NOTE - ADDITIONAL TRENCHING WILL BE REQUIRED BY ONE OR MORE OF THE UTILITIES FOR SERVICE STRUCTURE INSTALLATIONS. THESE REQUIREMENTS ARE TO BE CONFIRMED PRIOR TO COMMENCEMENT OF WORK.
- ACCESS THROUGH ALL BRIDGE STRUCTURES, BEBO ARCHES, FLOODWAYS ETC. IS TO BE VIA CONDUITS. SUPPLY AND INSTALLATION IS THE RESPONSIBILITY OF THE DEVELOPERS CONTRACTOR, OR AS DIRECTED BY THE RELEVANT UTILITY.
- WHERE THE SHARED TRENCH ALIGNMENT CONFLICTS WITH VALUABLE TREES, THE DEVELOPERS CONTRACTOR IS TO CONFIRM AN ALTERNATIVE ALIGNMENT THAT SUITS THE RELEVANT AUTHORITY & UTILITIES.
- UTILITIES ROAD CROSSINGS ARE TO SUIT THE SHARED TRENCH ALIGNMENT.
- THE DEVELOPERS CONTRACTOR WILL BE RESPONSIBLE FOR CLEARLY AND ACCURATELY IDENTIFYING THE LOCATION OF ROAD CROSSINGS BY MARKING THE KERB FACE WITH E.G.T. WHERE RELEVANT.
- IN THE CASE OF ABNORMAL SITE CONDITIONS EXISTING, ie SUBSTANTIAL AMOUNTS OF ROCK, CONFINED VERGE CORRIDORS ETC, A SITE SPECIFIC SHARED TRENCH ARRANGEMENT MAY BE UTILISED UPON APPROVAL BY THE RELEVANT SHARING PARTIES.
- PRIOR TO ANY EXCAVATION NEAR EXISTING PLANT, THE TRENCH PROVIDER SHALL OBTAIN DETAILS OF SERVICE LOCATIONS. REFERENCE TO SYDNEY ONE-CALL SERVICE IS RECOMMENDED.

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PRELIMINARY ISSUE
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No.	DATE	REVISIONS	BY
A	31/10/2023	ISSUED FOR 80% CLIENT REVIEW	LR

ESSENTIAL ENERGY
ZONE SUBSTATION SVH
THRUMSTER STREET, PORT MACQUARIE NSW

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ZONE SUBSTATION SVH
GENERAL NOTES

DRAWING NUMBER/REFERENCE: 8031-1001-002		
DESIGNER: DG	ORIGIN OF LEVELS: AHD	REV.: A
SURVEYOR: RN	HEIGHT: 2.712	
DRAFTING: LR	DATUM: AHD	SHEET SIZE: A1
APPROVED: DG	SCALE: AS SHOWN	

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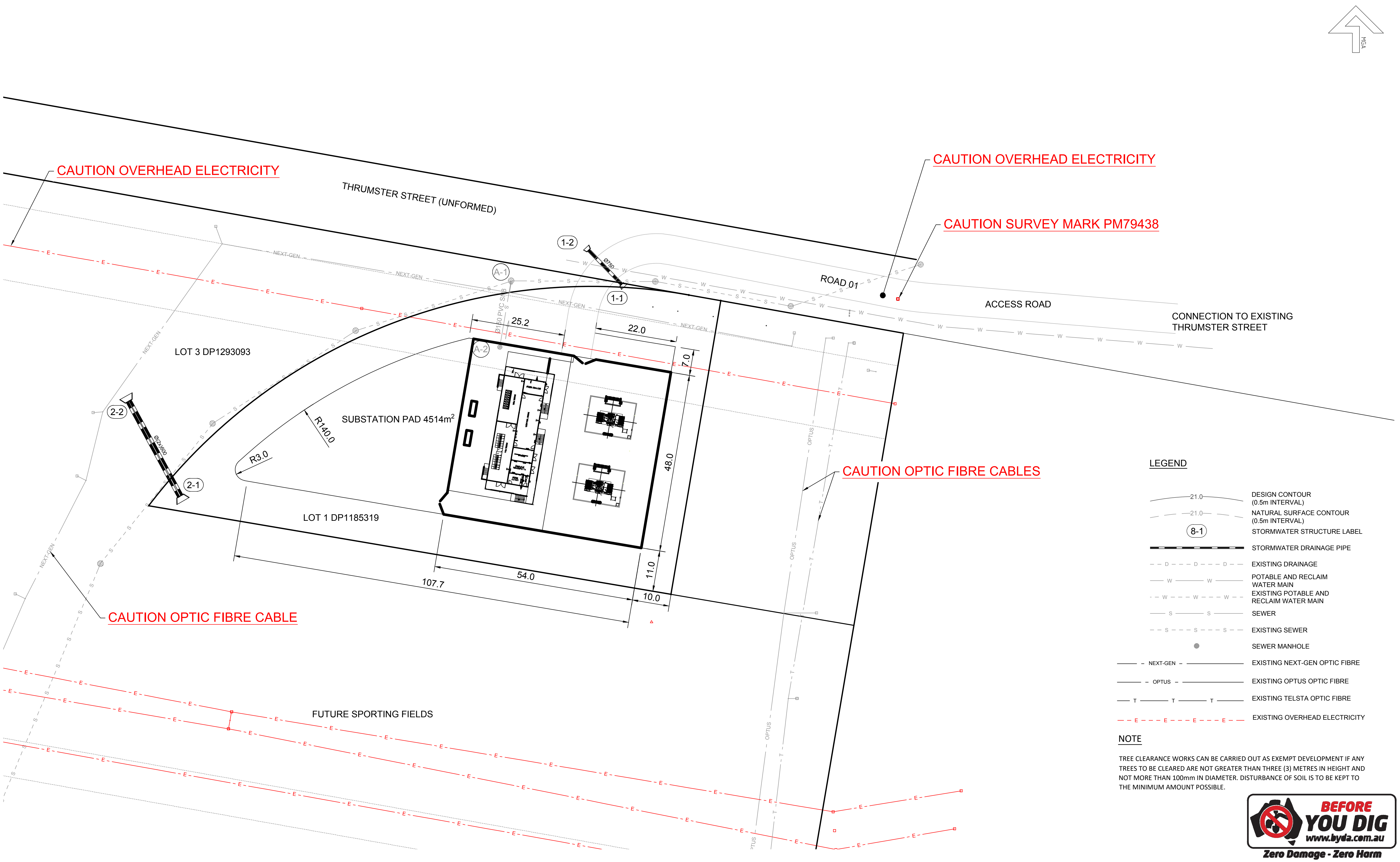

LEGEND

—21.0—	DESIGN CONTOUR (0.5m INTERVAL)
– –21.0– –	NATURAL SURFACE CONTOUR (0.5m INTERVAL)
(8-1)	STORMWATER STRUCTURE LABEL
▬ ▬ ▬	STORMWATER DRAINAGE PIPE
– – D – – D – – D – –	EXISTING DRAINAGE
—— W —— W ——	POTABLE AND RECLAIM WATER MAIN
– – W – – W – – W – –	EXISTING POTABLE AND RECLAIM WATER MAIN
—— S —— S ——	SEWER
– – S – – S – – S – –	EXISTING SEWER
●	SEWER MANHOLE
—— – NEXT-GEN – ——	EXISTING NEXT-GEN OPTIC FIBRE
—— – OPTUS – ——	EXISTING OPTUS OPTIC FIBRE
—— T —— T —— T ——	EXISTING TELSTA OPTIC FIBRE
– – E – – E – – E – – E – –	EXISTING OVERHEAD ELECTRICITY

NOTE

TREE CLEARANCE WORKS CAN BE CARRIED OUT AS EXEMPT DEVELOPMENT IF ANY TREES TO BE CLEARED ARE NOT GREATER THAN THREE (3) METRES IN HEIGHT AND NOT MORE THAN 100mm IN DIAMETER. DISTURBANCE OF SOIL IS TO BE KEPT TO THE MINIMUM AMOUNT POSSIBLE.

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0 5 10 20 30
Full Size 1:500 ; Half Reduction 1:1000
SCALE (m)

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A	31/10/2023	ISSUED FOR 80% CLIENT REVIEW	LR

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ZONE SUBSTATION SVH
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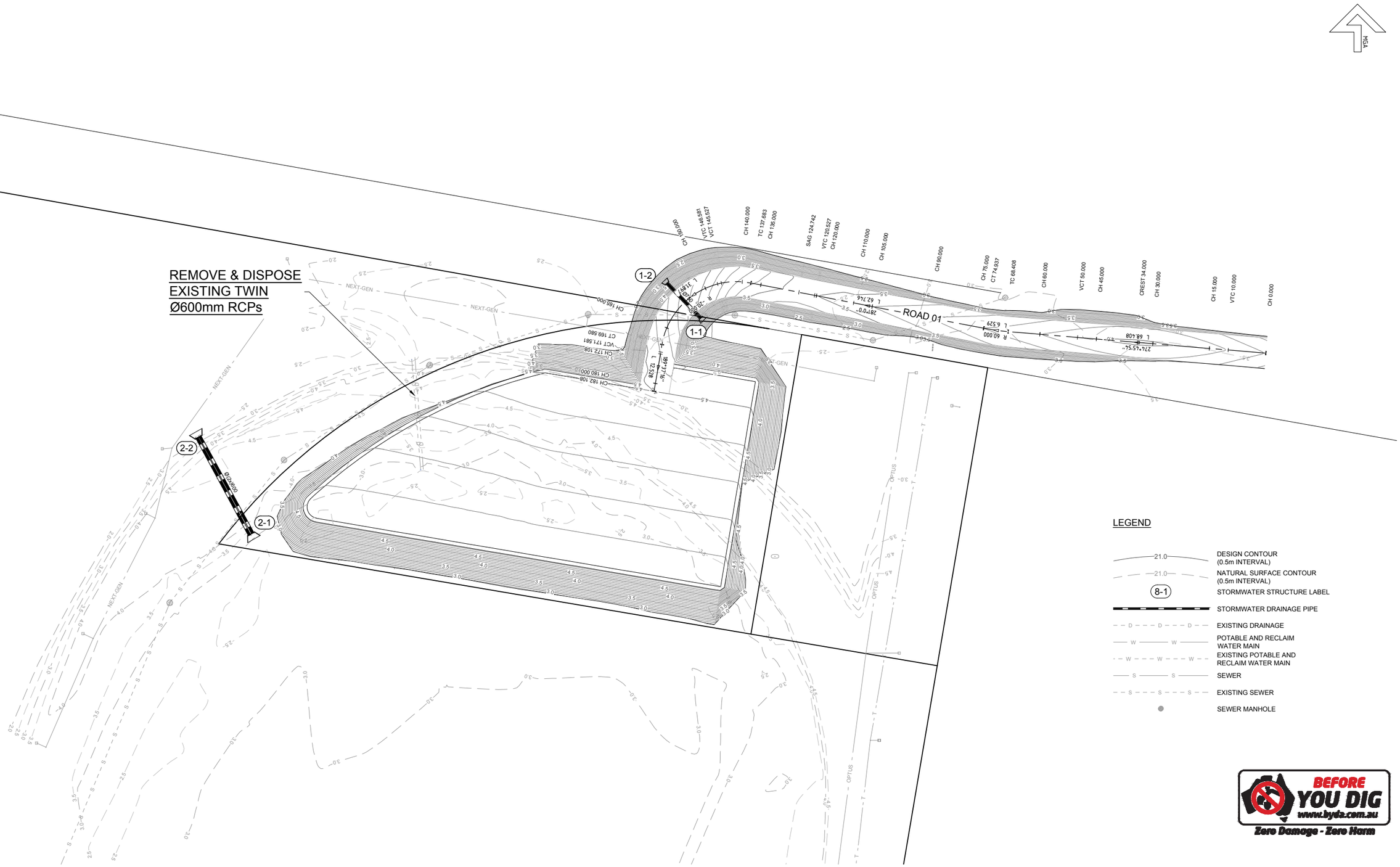
ZONE SUBSTATION SVH
SITE LAYOUT PLAN

DRAWING NUMBER/REFERENCE: 8031-1001-003		
DESIGNER: DG	ORIGIN OF LEVELS: AHD	REV.: A
SURVEYOR: RN	HEIGHT: 2.712	
DRAFTING: LR	DATUM: AHD	SHEET SIZE: A1
APPROVED: DG	SCALE: AS SHOWN	

Cad File: S:\Projects\8031 Essential\DWGS\CIVIL\8031-1001.dwg, Layout: 04ga, Plotted By: luke.robins, Date: 31/10/23 - 09:22,



LEGEND

- DESIGN CONTOUR (0.5m INTERVAL)
- NATURAL SURFACE CONTOUR (0.5m INTERVAL)
- 8-1 STORMWATER STRUCTURE LABEL
- STORMWATER DRAINAGE PIPE
- EXISTING DRAINAGE
- POTABLE AND RECLAIM WATER MAIN
- EXISTING POTABLE AND RECLAIM WATER MAIN
- SEWER
- EXISTING SEWER
- SEWER MANHOLE

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Zero Damage - Zero Harm

0 5 10 20 30
Full Size 1:500 ; Half Reduction 1:1000
SCALE (m)

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ESSENTIAL ENERGY
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ZONE SUBSTATION SVH
ROADS AND DRAINAGE LAYOUT PLAN

Drawing Number/Reference	8031-1001-004		
Designer	DG	Origin Of Levels	AHD
Surveyor	RN	Height	2.712
Drafting	LR	Datum	AHD
Approved	DG	Scale	AS SHOWN
		Rev.	A
		Sheet Size	A1

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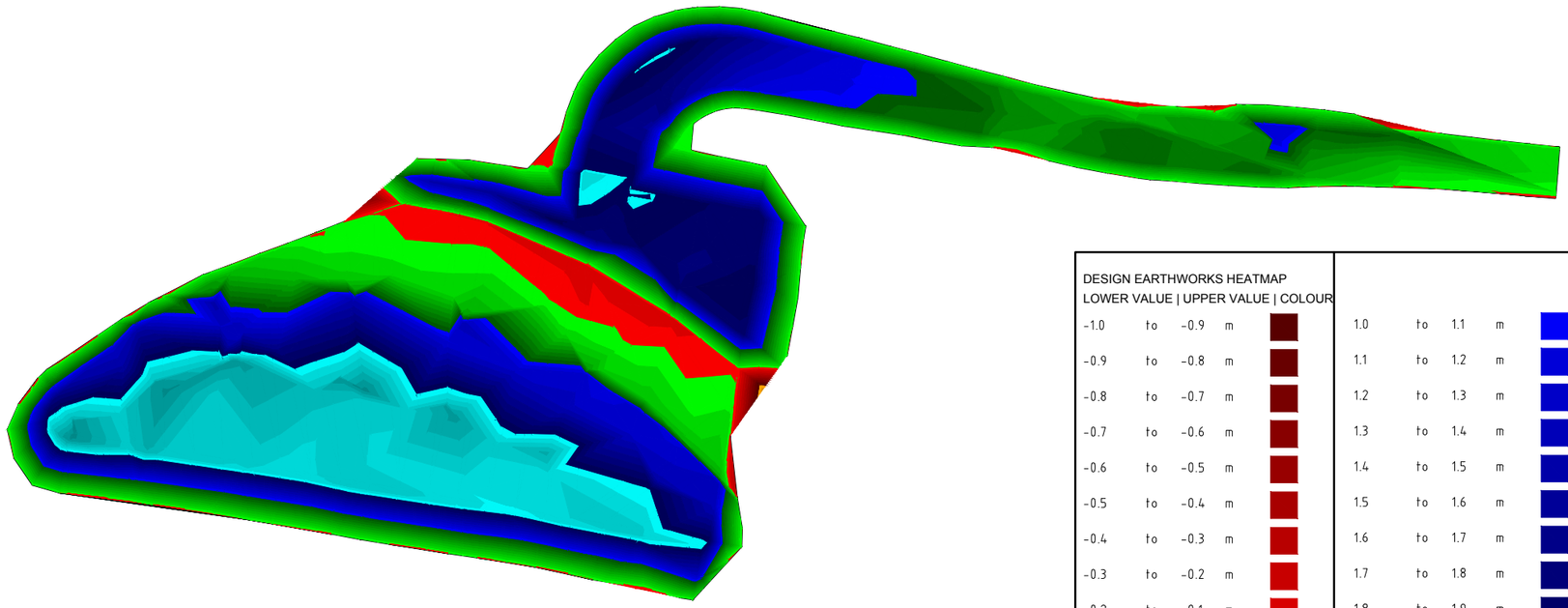

DESIGN EARTHWORKS HEATMAP

LOWER VALUE		UPPER VALUE		COLOUR
-1.0 m	to	-0.9 m		
-0.9 m	to	-0.8 m		
-0.8 m	to	-0.7 m		
-0.7 m	to	-0.6 m		
-0.6 m	to	-0.5 m		
-0.5 m	to	-0.4 m		
-0.4 m	to	-0.3 m		
-0.3 m	to	-0.2 m		
-0.2 m	to	-0.1 m		
-0.1 m	to	0.0 m		
0.0 m	to	0.1 m		
0.1 m	to	0.2 m		
0.2 m	to	0.3 m		
0.3 m	to	0.4 m		
0.4 m	to	0.5 m		
0.5 m	to	0.6 m		
0.6 m	to	0.7 m		
0.7 m	to	0.8 m		
0.8 m	to	0.9 m		
0.9 m	to	1.0 m		
1.0 m	to	1.1 m		
1.1 m	to	1.2 m		
1.2 m	to	1.3 m		
1.3 m	to	1.4 m		
1.4 m	to	1.5 m		
1.5 m	to	1.6 m		
1.6 m	to	1.7 m		
1.7 m	to	1.8 m		
1.8 m	to	1.9 m		
1.9 m	to	2.0 m		
2.0 m	to	2.1 m		
2.1 m	to	2.2 m		
2.2 m	to	2.3 m		
2.3 m	to	2.4 m		
2.4 m	to	2.5 m		
2.5 m	to	2.6 m		
2.6 m	to	2.7 m		
2.7 m	to	2.8 m		
2.8 m	to	2.9 m		
2.9 m	to	300 m		

EARTHWORKS VOLUMES (m^3)

CUT	28.064
FILL	10,387.608
BALANCE	10,359.544
NOTE: ASSUMES USEABLE IN-SITU MATERIAL - FINAL VOLUME SUBJECT TO GEOTECH RECOMMENDATIONS	

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Zero Damage - Zero Harm

0 5 10 20 30
Full Size 1:500 ; Half Reduction 1:1000
SCALE (m)

PRELIMINARY ISSUE
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No.	DATE	REVISIONS	BY
A	31/10/2023	ISSUED FOR 80% CLIENT REVIEW	LR

ESSENTIAL ENERGY
ZONE SUBSTATION SVH
THRUMSTER STREET, PORT MACQUARIE NSW

Hopkins
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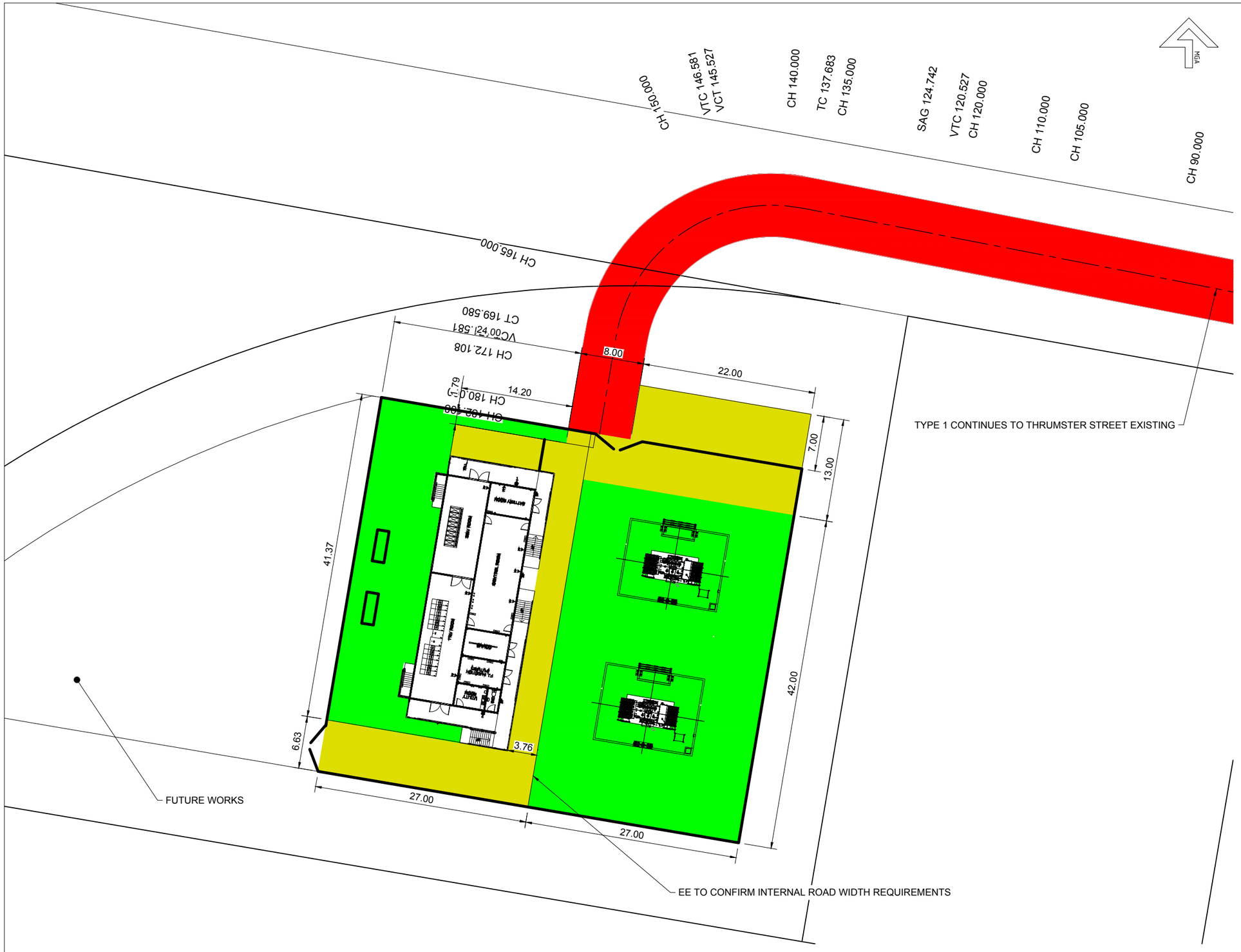
ZONE SUBSTATION SVH
EARTHWORKS HEATMAP

Drawing Number/Reference	8031-1001-005		
Designer	DG	Origin Of Levels	AHD
Surveyor	RN	Height	2.712
Drafting	LR	Datum	AHD
Approved	DG	Scale	AS SHOWN
		Rev.	A
		Sheet Size	A1

Cad File: S:\Projects\8031 Essential\DWGS\CIVIL\8031-1001.dwg, Layout: EW, Plotted By: luke.robins, Date: 31/10/23 - 09:22,

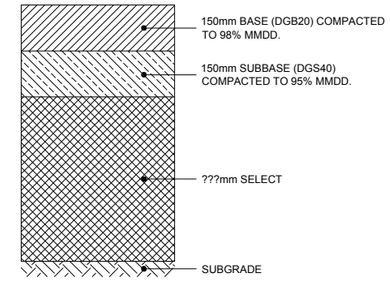


LEGEND - PAVEMENT TYPE:

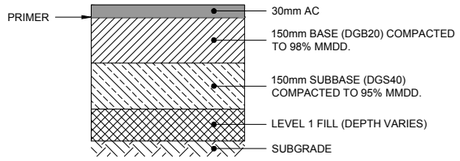
TYPE 1
PAVEMENT DEPTH (INC. AC) ..... ???mm

TYPE 2
PAVEMENT DEPTH (INC. AC) ..... ???mm

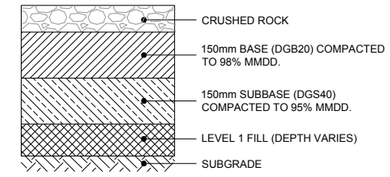
TYPE 3
PAVEMENT DEPTH (INC. AC) ..... ???mm



TYPE 1
PAVEMENT ???mm
N.T.S.



TYPE 2
PAVEMENT 330mm (inc. AC)
N.T.S.



TYPE 3
PAVEMENT 300mm
N.T.S.

NOTES:
1. PAVEMENT DESIGN IS BASED ON SITE GEOTECHNICAL REPORT xxxxx DATED xxxx .
2. ADDITIONAL SELECT MATERIAL MAY BE REQUIRED (AS PER GEOTECHNICAL REPORT)

0 2.5 5 10 15
Full Size 1:250 ; Half Reduction 1:500
SCALE (m)

PRELIMINARY ISSUE
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No.	DATE	REVISIONS	BY
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ESSENTIAL ENERGY
ZONE SUBSTATION SVH
THRUMSTER STREET, PORT MACQUARIE NSW

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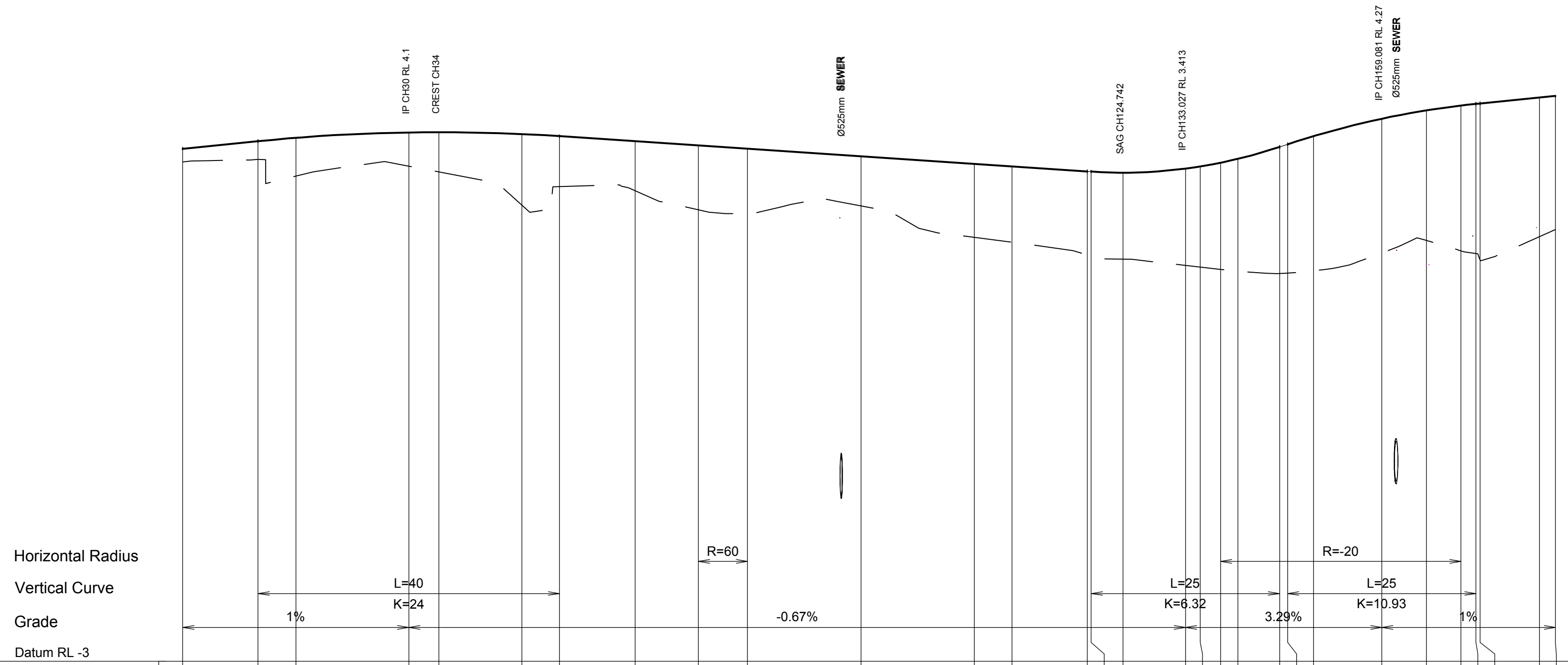
ZONE SUBSTATION SVH
PAVEMENT PLAN

Drawing Number/Reference	8031-1001-006		
Designer	DG	Origin Of Levels	AHD
Surveyor	RN	Height	2.712
Drafting	LR	Datum	AHD
Approved	DG	Scale	AS SHOWN
		Rev.	A
		Sheet Size	A1

Cad File: S:\Projects\8031 Essential\DWGS\CIVIL\8031-1001.dwg, Layout: pav, Plotted By: luke.robins, Date: 31/10/23 - 09:22,



Chainage	Cut/Fill	Design Surface	Natural Surface
0.000		3.800	
10.000		3.900	
15.000	0.508	3.945	3.437
30.000	0.449	4.017	3.568
34.000	0.528	4.020	3.492
45.000	0.944	3.995	3.051
50.000	0.670	3.967	3.297
60.000	0.655	3.900	3.245
68.408	0.854	3.844	2.990
74.937	0.852	3.800	2.948
90.000	0.658	3.700	3.042
105.000	0.976	3.600	2.624
110.000	1.005	3.567	2.561
120.000	1.105	3.500	2.395
120.527	1.116	3.496	2.381
124.742	1.148	3.482	2.335
133.027	1.284	3.537	2.253
135.000	1.335	3.566	2.231
137.683	1.414	3.615	2.201
140.000	1.490	3.667	2.176
145.527	1.681	3.824	2.143
146.581	1.709	3.859	2.149
150.000	1.786	3.966	2.180
159.081	1.783	4.198	2.416
165.000	1.726	4.309	2.584
169.580	1.927	4.373	2.446
171.581	1.985	4.395	2.409
172.108	2.075	4.400	2.325
180.000	1.846	4.479	2.633
182.108	1.774	4.500	2.726

Horizontal Scale 1:500
Vertical Scale 1:50

LONGITUDINAL SECTION ROAD 01

0 1 2 4 6
Full Size 1:100 ; Half Reduction 1:200
SCALE (m)

0 5 10 20 30
Full Size 1:500 ; Half Reduction 1:1000
SCALE (m)

PRELIMINARY ISSUE
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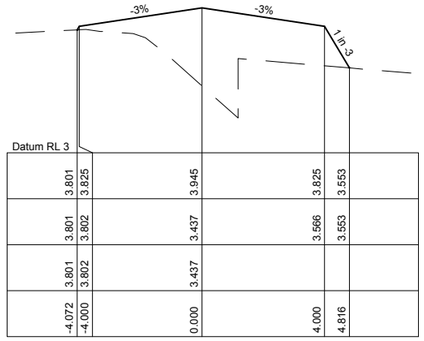
ZONE SUBSTATION SVH
ROAD LONGITUDINAL SECTION ROAD 01

DRAWING NUMBER/REFERENCE: 8031-1001-007		
DESIGNER: DG	ORIGIN OF LEVELS: AHD	REV.: A
SURVEYOR: RN	HEIGHT: 2.712	
DRAFTING: LR	DATUM: AHD	SHEET SIZE: A1
APPROVED: DG	SCALE: AS SHOWN	

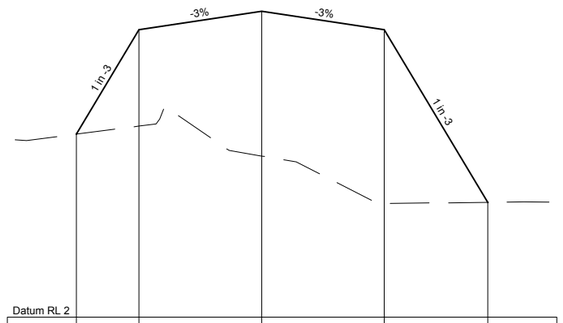
Cad File: S:\Projects\8031 Essential\DWGS\CIVIL\8031-1001.dwg, Layout: LS1, Plotted By: luke.robins, Date: 31/10/23 - 09:22,

NOTE:
ALTHOUGH THE NATURAL SURFACE HAS BEEN GENERALLY SURVEYED, LIDAR DATA HAS BEEN USED AT SOME LOCATIONS OUTSIDE OF THE SURVEY EXTENTS (CH 0 - CH 30).



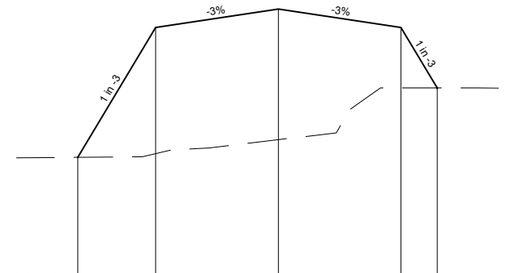
3.801	3.825	3.945	3.825	3.553	
3.801	3.802	3.437	3.566	3.553	
3.801	3.802	3.437			
-4.072	-4.000	0.000	4.000	4.816	

CH 15



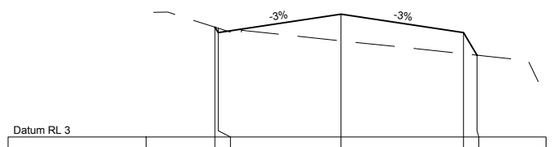
3.194	3.875	3.995	3.875	2.749	
3.194	3.246	3.051	2.742	2.749	
3.194	3.246	3.051	2.742	2.749	
-6.041	-4.000	0.000	4.000	7.376	

CH 45



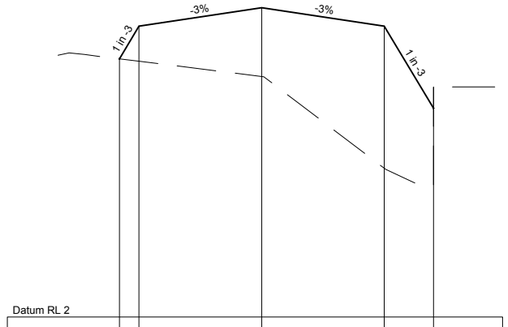
2.834	3.680	3.800	3.680	3.285	
2.834	2.858	2.949	3.285	3.285	
2.834	2.858	2.949	3.285	3.285	
-6.539	-4.000	0.000	4.000	5.184	

CH 75



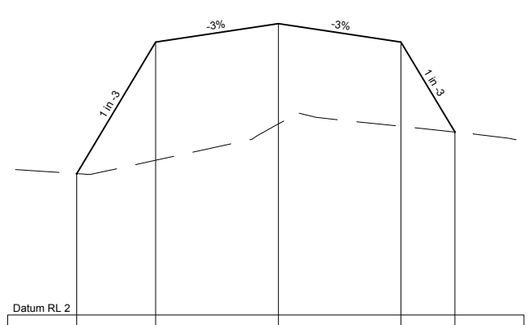
Design Surface	3.716	3.680	3.800	3.680	3.533	
Supplemental LIDAR	3.716	3.709	3.627	3.542	3.533	
Natural Surface	3.716	3.709				
Offset	-4.107	-4.000	0.000	4.000	4.441	

CH 0



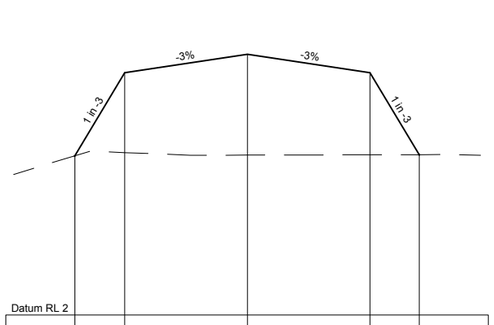
3.683	3.897	4.017	3.897	3.362	
3.683	3.667	3.568	2.970	3.500	
3.683	3.667	3.568	2.970		
-4.642	-4.000	0.000	4.000	5.605	

CH 30



2.921	3.780	3.900	3.780	3.193	
2.921	3.009	3.245	3.230	3.193	
2.921	3.009	3.245	3.230	3.193	
-6.577	-4.000	0.000	4.000	5.760	

CH 60



3.037	3.580	3.700	3.580	3.045	
3.037	3.058	3.042	3.044	3.045	
3.037	3.058	3.042	3.044	3.045	
-5.629	-4.000	0.000	4.000	5.605	

CH 90

0 1 2 4 6
Full Size 1:100 ; Half Reduction 1:200
SCALE (m)

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ZONE SUBSTATION SVH
THRUMSTER STREET, PORT MACQUARIE NSW

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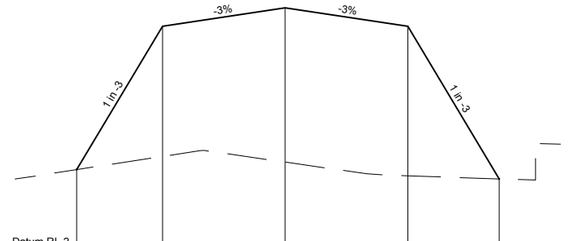
ZONE SUBSTATION SVH
ROAD CROSS SECTIONS
ROAD 01
(1 OF 3)

Drawing Number/Reference: 8031-1001-008			
Designer: DG	Origin Of Levels: AHD	Rev.: A	
Surveyor: RN	Height: 2.712		
Drafting: LR	Datum: AHD	Sheet Size: A1	
Approved: DG	Scale: AS SHOWN		

Cad File: S:\Projects\8031 Essential\DWGS\CIVIL\8031-1001.dwg, Layout: XS01, Plotted By: luke.robins, Date: 31/10/23 - 09:22,

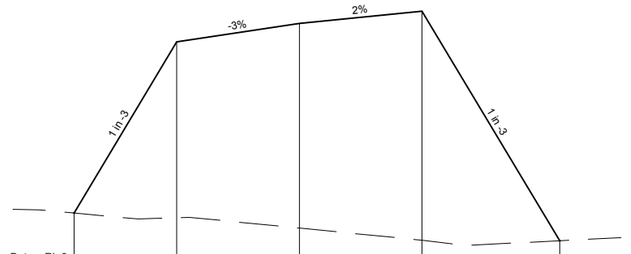
NOTE:
ALTHOUGH THE NATURAL SURFACE HAS BEEN GENERALLY SURVEYED, LIDAR DATA HAS BEEN USED AT SOME LOCATIONS OUTSIDE OF THE SURVEY EXTENTS (CH 0 - CH 30).



Datum RL 2

2.512	3.447	3.567	3.447	2.452	
2.512	2.599	2.561	2.472	2.452	
2.512	2.599	2.561	2.472	2.452	
-6.803	-4.000	0.000	4.000	6.983	

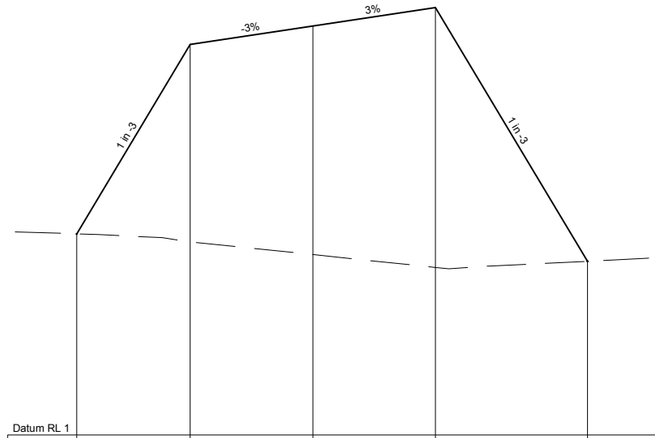
CH 110



Datum RL 2

2.329	3.446	3.566	3.646	2.149	
2.329	2.299	2.231	2.152	2.149	
2.329	2.299	2.231	2.152	2.149	
-7.349	-4.000	0.000	4.000	8.491	

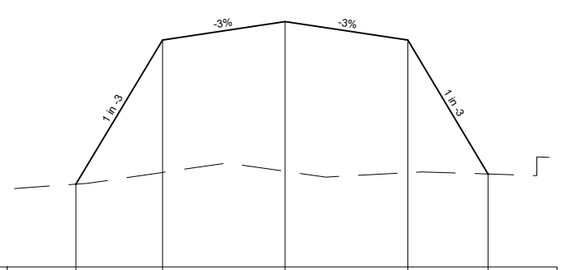
CH 135



Datum RL 1

2.311	3.547	3.667	3.787	2.133	
2.311	2.260	2.176	2.093	2.133	
2.311	2.260	2.176	2.093	2.133	
-7.706	-4.000	0.000	4.000	8.961	

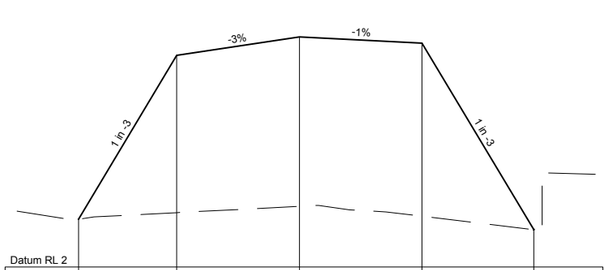
CH 140



Datum RL 2

Design Surface	2.539	3.480	3.600	3.480	2.606	
Supplemental LIDAR	2.539	2.616	2.624	2.615	2.606	
Natural Surface	2.539	2.616	2.624	2.615	2.606	
Offset	-6.822	-4.000	0.000	4.000	6.622	

CH 105



Datum RL 2

2.311	3.380	3.500	3.460	2.243	
2.311	2.354	2.395	2.331	2.243	
2.311	2.354	2.395	2.331	2.243	
-7.206	-4.000	0.000	4.000	7.650	

CH 120

0 1 2 4 6
Full Size 1:100 ; Half Reduction 1:200
SCALE (m)

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ESSENTIAL ENERGY
ZONE SUBSTATION SVH
THRUMSTER STREET, PORT MACQUARIE NSW

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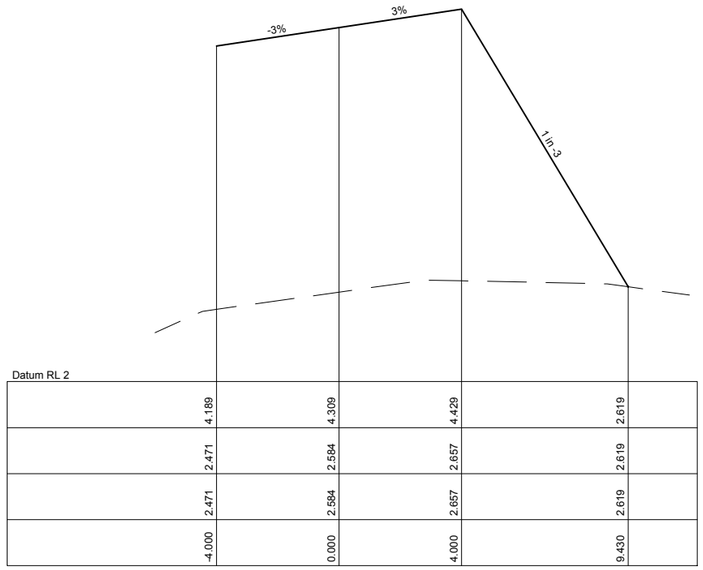
ZONE SUBSTATION SVH
ROAD CROSS SECTIONS
ROAD 01
(2 OF 3)

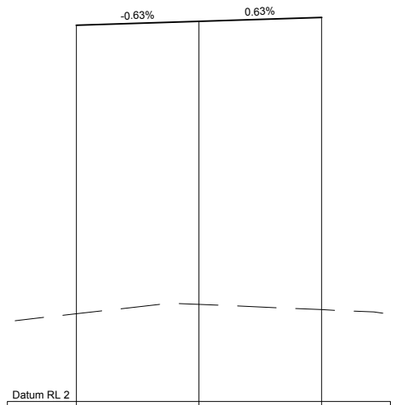
Drawing Number/Reference	8031-1001-009		
Designer	DG	Origin Of Levels	AHD
Surveyor	RN	Height	2.712
Drafting	LR	Datum	AHD
Approved	DG	Scale	AS SHOWN
		Rev.	A
		Sheet Size	A1

Cad File: S:\Projects\8031 Essential\DWGS\CIVIL\8031-1001.dwg, Layout: XS02, Plotted By: luke.robins, Date: 31/10/23 - 09:22,



	4.169	4.309	4.429	2.619	
	2.471	2.584	2.657	2.619	
	2.471	2.584	2.657	2.619	
	-4.000	0.000	4.000	9.430	

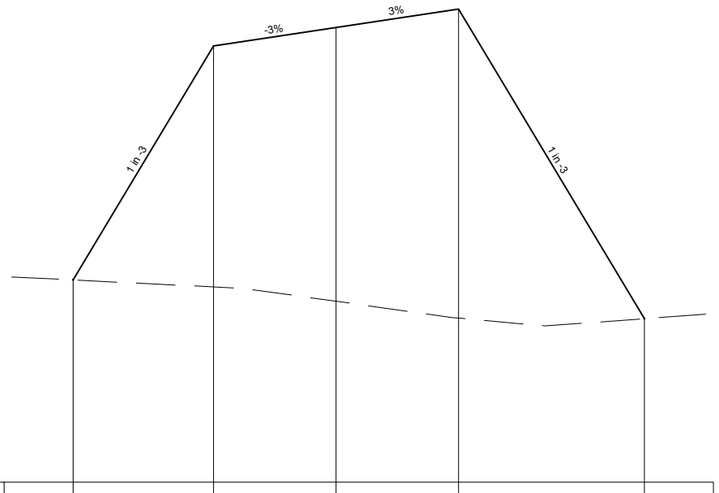
CH 165



4.454	4.479	4.504		
2.572	2.633	2.598		
2.572	2.633	2.598		
-4.000	0.000	4.000		

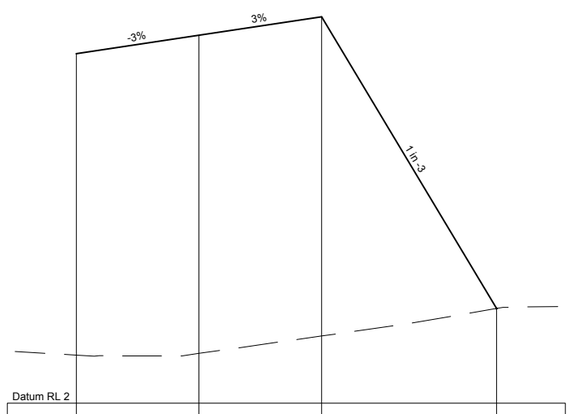
CH 180

NOTE:
ALTHOUGH THE NATURAL SURFACE HAS BEEN GENERALLY SURVEYED, LIDAR DATA HAS BEEN USED AT SOME LOCATIONS OUTSIDE OF THE SURVEY EXTENTS (CH 0 - CH 30).



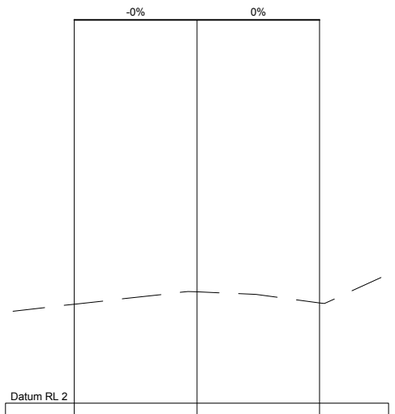
Design Surface	2.319	3.846	3.966	4.086	2.066	
Supplemental LIDAR	2.319	2.274	2.180	2.070	2.066	
Natural Surface	2.319	2.274	2.180	2.070	2.066	
Offset	-8.580	-4.000	0.000	4.000	10.058	

CH 150



4.280	4.400	4.520	2.618	
2.314	2.325	2.439	2.618	
2.314	2.325	2.439	2.618	
-4.000	0.000	4.000	9.706	

CH 172.108



4.500	4.500	4.500	
2.646	2.726	2.655	
2.646	2.726	2.655	
-4.000	0.000	4.000	

CH 182.108

0 1 2 4 6
Full Size 1:100 ; Half Reduction 1:200
SCALE (m)

PRELIMINARY ISSUE
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A	31/10/2023	ISSUED FOR 80% CLIENT REVIEW	LR

ESSENTIAL ENERGY
ZONE SUBSTATION SVH
THRUMSTER STREET, PORT MACQUARIE NSW

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ZONE SUBSTATION SVH
ROAD CROSS SECTIONS
ROAD 01
(3 OF 3)

Drawing Number/Reference	8031-1001-010		
Designer	DG	Origin of Levels	AHD
Surveyor	RN	Height	2.712
Drafting	LR	Datum	AHD
Approved	DG	Scale	AS SHOWN
Rev.	A		
Sheet Size	A1		

Cad File: S:\Projects\8031 Essential\DWGS\CIVIL\8031-1001.dwg, Layout: XS03, Plotted By: luke.robins, Date: 31/10/23 - 09:22,

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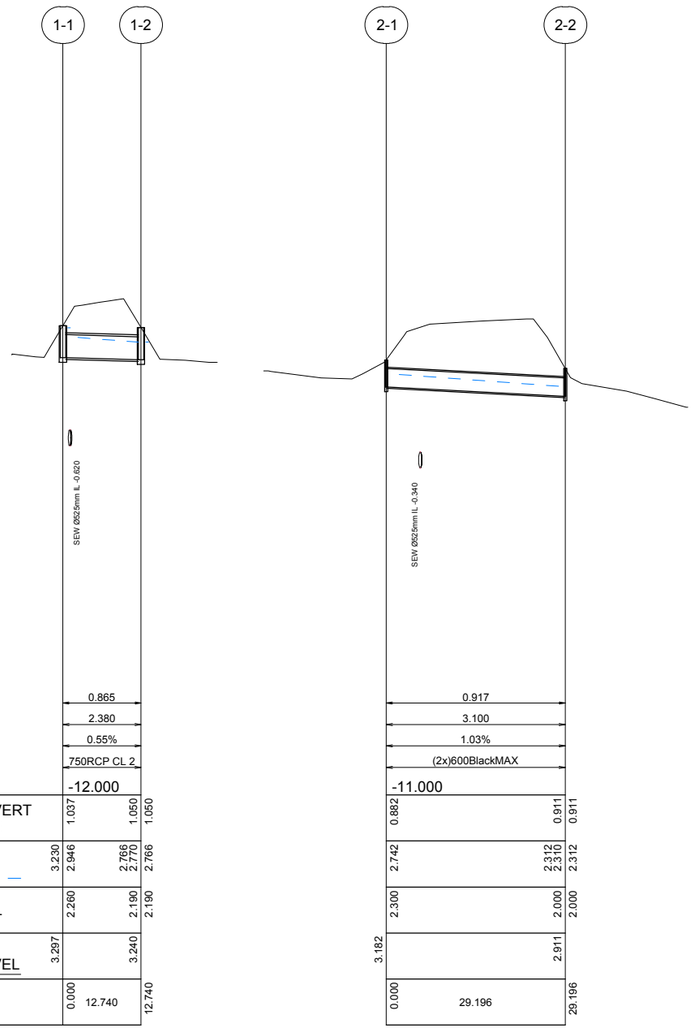
DRAINAGE PIT SCHEDULE - ESSENTIAL ENERGY

PIT No.	SETOUT CO-ORDINATES		LOCATION OFFSETS			PIT TYPE
	EASTING	NORTHING	CHAINAGE	CTRL ROAD	OFFSET	
1-1	4236.457	20635.314	156.328	ROAD01	-5.918	STD HEADWALL (TO SUIT 750 dia RCP)
1-2	4227.596	20644.467	156.603	ROAD01	6.819	STD HEADWALL (TO SUIT 750 dia RCP)
2-1	4117.569	20578.143				STD HEADWALL (TO SUIT 2x600 dia BlackMAX)
2-2	4093.523	20594.702				STD HEADWALL (TO SUIT 2x600 dia BlackMAX)



PIT / NODE DETAILS — Version 15

Name	Type	Family	Size	Ponding Volume (cu.m)	Pressure Change Coeff. Ku	Surface Elev (m)	Max Pond Depth (m)	Base Inflow (cu.m/s)	Blocking Factor	x	y	Bolt-down id	Part Full Shock Loss	Inflow Hydrograph	Pit is	Internal Width (mm)	Inflow is Misaligned	Minor Safe Pond Depth (m)	Major Safe Pond Depth (m)
2-2	Node					2.911		0		4093.523	20594.702		27095559		No				
1-1	Headwall				0.5	3.297		0		4236.457	20635.314		27098327						
1-2	Node					3.240		0		4227.596	20644.467		27098328		No				

DETENTION BASIN DETAILS

Name	Elev	Surf. Area	Not Used	Outlet Type	K	Dia(mm)	Centre RL	Pit Family	Pit Type	x	y	HED	Crest RL	Crest Length	id
2-1	2.3	0		Culvert	0.5					4117.569	20578.143	No			27095560
	2.4	41													
	2.6	1160													
	2.8	2244													
	3	14443													
	3.2	15708													
	3.4	16663													
	3.6	17566													
	3.8	18174													
	4	18493													

SUB-CATCHMENT DETAILS

Name	Pit or Node	Total Area (ha)	Paved Area %	Grass Area %	Supp Area %	Paved Time (min)	Grass Time (min)	Supp Time (min)	Paved Length (m)	Grass Length (m)	Supp Length (m)	Paved Slope (%) %	Grass Slope %	Supp Slope %	Paved Rough	Grass Rough	Supp Rough	Lag Time or Factor	Gutter Length (m)	Gutter Slope %	Gutter Flow	Factc	Rainfall Multiplier
C 2-1	2-1	5.9064	0.0	100.0	0.0	0	0	0	0	325	0	0.91	0.91	0.91	0.012	0.3	0.02	-1					1
C 1-1	1-1	2.1466	41.0	59.0	0.0	1	0	0	53.56	203	0	0.92	0.5	0.5	0.012	0.3	0.02	-1					1

PIPE DETAILS

Name	From	To	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Type	Dia (mm)	I.D. (mm)	Rough	Pipe Is	No. Pipes	Chg From	At Chg	Chg (m)	RI (m)	Chg (m)	RL (m)	etc (m)														
P 2-1	2-1	2-2	29.196	2.300	2.000	1.03	BlackMAX	600	596	0.06	NewFixed	2	2-1	0	0	3.182	2.89	3.974	3.322	4.104	4.099	4.153	7.117	4.352	15.58	4.45	22.878	4.521	24.01	4.52	26.3	3.922	29.196	2.911
P 1-1	1-1	1-2	12.74	2.260	2.190	0.55	RCP CL 2	750	750	0.6	NewFixed	1	1-1	0	0	3.297	1.906	3.937	3.151	3.973	5.903	4.061	7.397	4.104	9.9	4.183	12.74	3.24						

DETAILS of SERVICES CROSSING PIPES

Pipe	Chg (m)	Bottom Elev (m)	Height of (m)	Chg (m)	Bottom Elev (m)	Height of (m)	Chg (m)	Bottom Elev (m)	Height of (m)	etc etc
P 2-1	5.544	-0.34	0.525							
P 1-1	1.171	-0.62	0.525							

CHANNEL DETAILS

Name	From	To	Type	Length (m)	U/S IL (m)	D/S IL (m)	Slope (%)	Base Widt (m)	L.B. Slope (1:?)	R.B. Slope (1:?)	Manning n	Depth (m)	Roofed

OVERFLOW ROUTE DETAILS

Name	From	To	Travel Time (min)	Spill Level (m)	Crest Length (m)	Weir Coeff. C	Cross Section	Safe Dept Major Sto (m)	Safe Depth Minor Sto (m)	Safe DxV (sq.m/sec	Bed Slope (%)	D/S Area Contributing %	id	U/S IL	D/S IL	Length (m)
F 2-1	2-1	2-2	0.2	3.800	10	2	Dummy su	0.2	0.05	0.6	3	0	27079075	3.8	3.7	29.1
F 1-1	1-1	1-2	0.1	3.297	15	2	F 1-1	0.3	0.3	0.6	3	0	27079073	3.3	3.18	12.8

PIPE COVER DETAILS

Name	Type	Dia (mm)	Safe Cove	Cover (m)	
P 2-1	BlackMAX	596	0.6	0.24	Unsafe
P 1-1	RCP CL 2	750	0.6	0.23	Unsafe

This model has no pipes with non-return valves

STORMWATER DRAINAGE CALCULATIONS (DATA)

DRAINS results prepared from Version 2023.10.8682.19045

PIT / NODE DETAILS — Version 8

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
2-2	2.24		0.000				
1-1	3.08		0.769		0.22	0.000	None
1-2	2.65		0.000				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
C 2-1	0.674	0.000	0.674	0.00	88.97	0.00	5% AEP, 1.5 hour burst, Storm 6
C 1-1	0.627	0.569	0.058	3.46	45.25	0.00	5% AEP, 5 min burst, Storm 1

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
P 2-1	0.565	2.71	2.645	2.238	5% AEP, 2 hour burst, Storm 4
P 1-1	0.628	2.23	2.817	2.646	5% AEP, 5 min burst, Storm 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
F 2-1	0	0	0.443	0	0	0	0	
F 1-1	0	0	51.080	0	0	0	0	

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
2-1	2.84	544.0	0.565	0.565	0.000

Run Log for 8031 (Essential Energy)
{\colortbl;\red0\green0\blue0;\red192\green0\blue0;}Run Log for 8031 (Essential Energy).drn -
DRAINS run at 09:54:53 on 30/10/2023 using Watercom Drains v2023.10.8682.19045
Flows were safe in all overflow routes.

STORMWATER DRAINAGE CALCULATIONS (5% AEP)

DRAINS results prepared from Version 2023.10.8682.19045

PIT / NODE DETAILS — Version 8

Name	Max HGL	Max Pond HGL	Max Surface Flow Arriving (cu.m/s)	Max Pond Volume (cu.m)	Min Freeboard (m)	Overflow (cu.m/s)	Constraint
2-2	2.31		0.000				
1-1	3.23		1.077		0.07	0.000	None
1-2	2.77		0.135				

SUB-CATCHMENT DETAILS

Name	Max Flow Q (cu.m/s)	Paved Max Q (cu.m/s)	Grassed Max Q (cu.m/s)	Paved Tc (min)	Grassed Tc (min)	Supp. Tc (min)	Due to Storm
C 2-1	1.113	0.000	1.113	0.00	78.47	0.00	1% AEP, 1.5 hour burst, Storm 3
C 1-1	0.866	0.766	0.100	3.18	40.19	0.00	1% AEP, 5 min burst, Storm 1

PIPE DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Max U/S HGL (m)	Max D/S HGL (m)	Due to Storm
P 2-1	0.917	3.10	2.742	2.312	1% AEP, 1.5 hour burst, Storm 2
P 1-1	0.865	2.38	2.946	2.766	1% AEP, 5 min burst, Storm 1

CHANNEL DETAILS

Name	Max Q (cu.m/s)	Max V (m/s)	Due to Storm

OVERFLOW ROUTE DETAILS

Name	Max Q U/S	Max Q D/S	Safe Q	Max D	Max DxV	Max Width	Max V	Due to Storm
F 2-1	0	0	13.276	0	0	0	0	
F 1-1	0	0	51.080	0	0	0	0	

DETENTION BASIN DETAILS

Name	Max WL	MaxVol	Max Q Total	Max Q Low Level	Max Q High Level
2-1	2.93	1083.4	0.917	0.917	0.000

Run Log for 8031 (Essential Energy)
{\colortbl;\red0\green0\blue0;\red192\green0\blue0;}Run Log for 8031 (Essential Energy).drn -
DRAINS run at 09:55:16 on 30/10/2023 using Watercom Drains v2023.10.8682.19045
Flows were safe in all overflow routes.

STORMWATER DRAINAGE CALCULATIONS (1% AEP)

0 1 2 4 6
Full Size 1:100 ; Half Reduction 1:200
SCALE (m)

0 5 10 20 30
Full Size 1:500 ; Half Reduction 1:1000
SCALE (m)

PRELIMINARY ISSUE
NOT FOR CONSTRUCTION

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No.	DATE	REVISIONS	BY
A	31/10/2023	ISSUED FOR 80% CLIENT REVIEW	LR

ESSENTIAL ENERGY
ZONE SUBSTATION SVH
THRUMSTER STREET, PORT MACQUARIE NSW

Hopkins
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ZONE SUBSTATION SVH
STORMWATER DRAINAGE
LONG SECTIONS, SCHEDULE, DATA & CALCULATIONS

Drawing Number/Reference	8031-1001-011
Designer	DG
Origin Of Levels	AHD
Rev.	A
Surveyor	RN
Height	2.712
Drafting	LR
Datum	AHD
Sheet Size	A1
Approved	DG
Scale	AS SHOWN

Cad File: S:\Projects\8031 Essential\DWGS\CIVIL\8031-1001.dwg, Layout: DrLS1, Plotted By: luke.robins, Date: 31/10/23 - 09:22,

LEGEND:

MGA

21.0 DESIGN CONTOUR (0.5m MAJ. INTERVAL)

DRAINAGE CATCHMENT BOUNDARY

DRAINAGE FLOW DIRECTION

0 10 20 40 60

Full Size 1:1000 ; Half Reduction 1:2000 SCALE (m)

PRELIMINARY ISSUE

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ZONE SUBSTATION SVH
STORMWATER DRAINAGE CATCHMENT PLAN

Drawing Number/Reference	8031-1001-012		
Designer	DG	Origin Of Levels	AHD
Surveyor	RN	Height	2.712
Drafting	LR	Datum	AHD
Approved	DG	Scale	AS SHOWN
Rev.	A	Sheet Size	A1

Cad File: S:\Projects\8031 Essential\DWGS\CIVIL\8031-1001.dwg, Layout: DRNcat, Plotted By: luke.robins, Date: 31/10/23 - 09:22,

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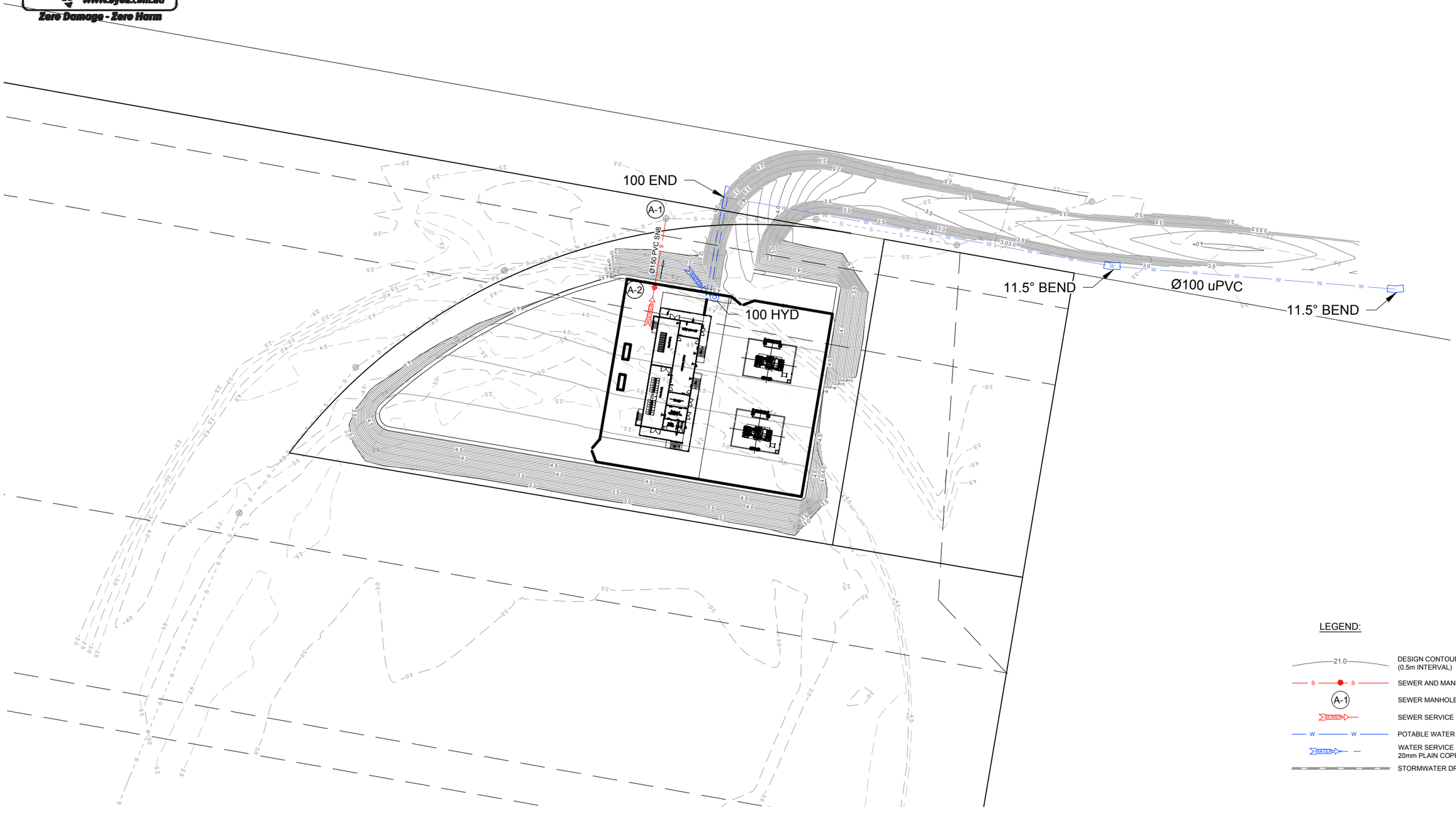

LEGEND:

- 21.0 — DESIGN CONTOUR (0.5m INTERVAL)
- S — S — SEWER AND MANHOLE
- A-1 — SEWER MANHOLE LABEL
- SEWER — SEWER SERVICE PONT
- W — W — POTABLE WATER MAIN
- WATER — WATER SERVICE POINT 20mm PLAIN COPPER
- STORMWATER DRAINAGE

0 5 10 20 30
Full Size 1:500 ; Half Reduction 1:1000
SCALE (m)

PRELIMINARY ISSUE
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A	31/10/2023	ISSUED FOR 80% CLIENT REVIEW	LR

ESSENTIAL ENERGY
ZONE SUBSTATION SVH
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ZONE SUBSTATION SVH
WATER AND SEWER RETICULATION LAYOUT PLAN

Drawing Number/Reference	8031-1001-013		
Designer	DG	Origin of Levels	AHD
Surveyor	RN	Height	2.712
Drafting	LR	Datum	AHD
Approved	DG	Scale	AS SHOWN
Rev.	A		
Sheet Size	A1		

Cad File: S:\Projects\8031 Essential\DWGS\CIVIL\8031-1001.dwg, Layout: WatSew1, Plotted By: luke.robins, Date: 31/10/23 - 09:22,

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SEWER LS

TO BE INCLUDED IN 100% DESIGN

MGA

0 5 10 20 30
Full Size 1:500 ; Half Reduction 1:1000
SCALE (m)

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ESSENTIAL ENERGY
ZONE SUBSTATION SVH
THRUMSTER STREET, PORT MACQUARIE NSW

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ZONE SUBSTATION SVH
SEWER LONGITUDINAL SECTION

Drawing Number/Reference: 8031-1001-014		
Designer: DG	Origin Of Levels: AHD	Rev.: A
Surveyor: RN	Height: 2.712	
Drafting: LR	Datum: AHD	Sheet Size: A1
Approved: DG	Scale: AS SHOWN	

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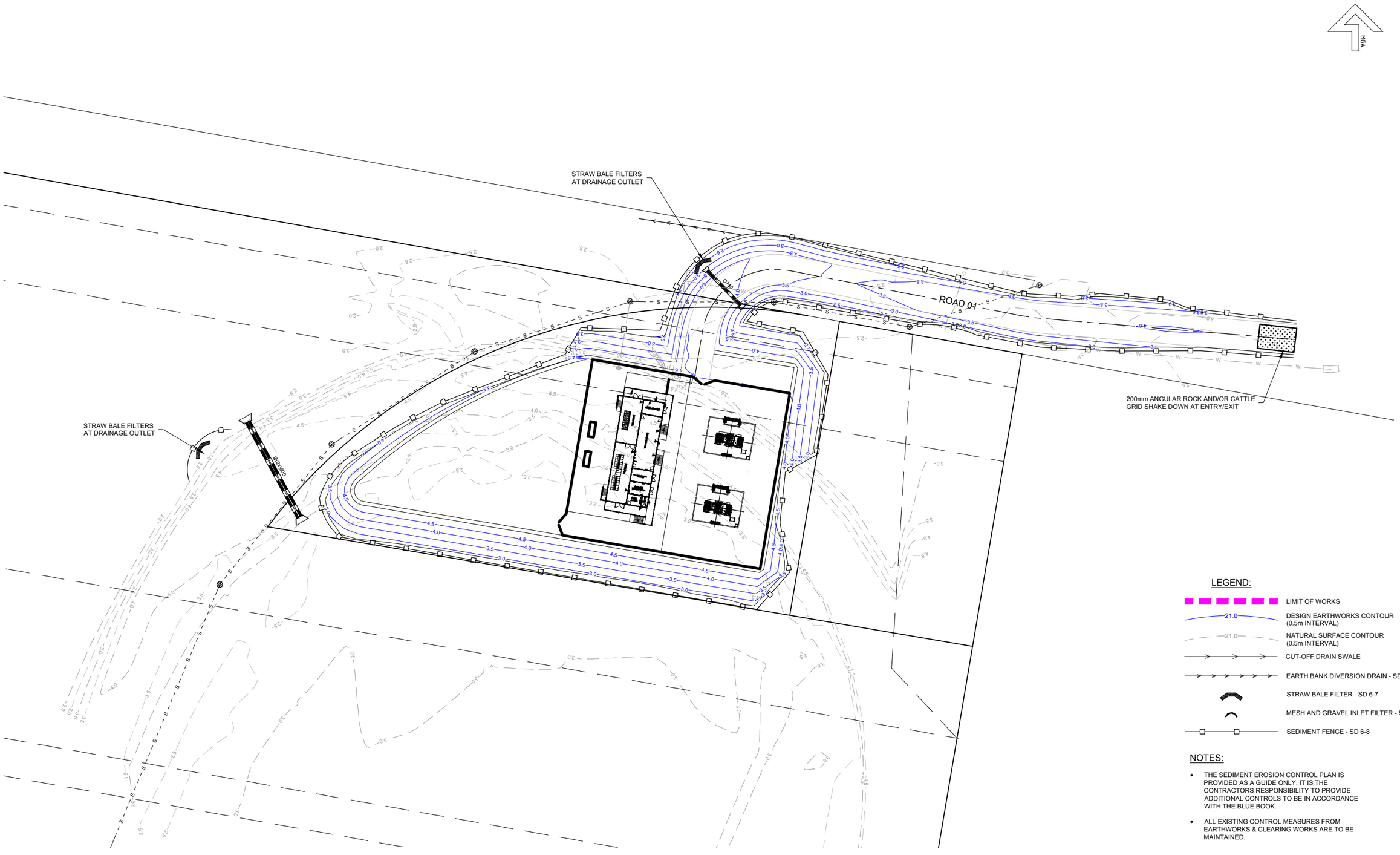

LEGEND:

- LIMIT OF WORKS
- 21.0 — DESIGN EARTHWORKS CONTOUR (0.5m INTERVAL)
- 21.0 — NATURAL SURFACE CONTOUR (0.5m INTERVAL)
- CUT-OFF DRAIN SWALE
- EARTH BANK DIVERSION DRAIN - SD 5-5
- STRAW BALE FILTER - SD 6-7
- MESH AND GRAVEL INLET FILTER - SD 6-11
- SEDIMENT FENCE - SD 6-8

NOTES:

- THE SEDIMENT EROSION CONTROL PLAN IS PROVIDED AS A GUIDE ONLY. IT IS THE CONTRACTORS RESPONSIBILITY TO PROVIDE ADDITIONAL CONTROLS TO BE IN ACCORDANCE WITH THE BLUE BOOK.
- ALL EXISTING CONTROL MEASURES FROM EARTHWORKS & CLEARING WORKS ARE TO BE MAINTAINED.

0 10 20 40 60
Full Size 1:1000 ; Half Reduction 1:2000
SCALE (m)

PRELIMINARY ISSUE
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A	31/10/2023	ISSUED FOR 80% CLIENT REVIEW	LR

ESSENTIAL ENERGY
ZONE SUBSTATION SVH
THRUMSTER STREET, PORT MACQUARIE NSW

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ZONE SUBSTATION SVH
SEDIMENT AND EROSION CONTROL

Drawing Number/Reference	8031-1001-015		
Designer	DG	Origin Of Levels	AHD
Rev.	A		
Surveyor	RN	Height	2.712
Drafting	LR	Datum	AHD
Sheet Size	A1		
Approved	DG	Scale	AS SHOWN

Cad File: S:\Projects\8031 Essential\DWGS\CIVIL\8031-1001.dwg, Layout: SED, Plotted By: luke.robins, Date: 31/10/23 - 09:22,

Appendix B – Ecological Impact Assessment

AREA Landscape Design Consultants Pty Ltd ABN: 56 646 194 176
- ✓ Commercial external landscape designs for built or natural environments
- ✓ Vegetation Management Plans
- ✓ Stakeholder and community engagement
- ✓ Peer review / project briefs / budgeting assistance

AREA Environmental & Heritage Consultants ABN: 29 616 529 867
- ✓ Environmental impact assessments and approvals : REFs, MW REFs, PEAs
- ✓ Ecology, Aboriginal and historic heritage assessments
- ✓ Biodiversity assessment method (BAM) assessments (BDAR) and offsetting (BSAR)
- ✓ Plans of Management
- ✓ Aboriginal community engagement
- ✓ Stakeholder and community engagement

1 November 2023

Brett Hayward
Environmental Services Manager
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E: brett.hayward@essentialenergy.com.au

Job: **Ecological Impact Assessment – Establishment of a 33/11kV Zone Substation, Thrumster NSW**

Author: Des Andersen c/o AREA Environmental & Heritage Consultants

Detail: This document provides an assessment of potential impacts to threatened species, populations and ecological communities addressing the requirements under the *Environment Protection and Conservation Act 1999,* NSW *Biodiversity Conservation Act 2016* and *NSW Fisheries Management Act 1994*

Date of field assessment: 27 September 2023.

1. The proposal

Essential Energy (the proponent) proposes to establish a new 33/11kV Zone Substation (ZS) at Sovereign Hills on the previously acquired site (Lot 1, DP 1185319) adjacent to TransGrid's Port Macquarie Thrumster 132/33kV substation. The proposal is designed to augment the existing electricity network to service a residential area in Thrumster, NSW (Figure 1-1 and 1-4). The proposal will involve:

- 2 x 30/40MVA transformers – Transformers will be filled with approx. 12000L of mineral oil. Transformers will be housed in appropriate oil containment bunds. The manufacturer guarantees an acoustic level of 75dB for these units.
- 1 x combined switchboard and control building. Approx. 35m x 14m.
- 2 x Auxiliary transformers.
- Underground conduits and cables in/out of zone substation.
- Underground earth grid throughout the zone substation.
- Palisade fence around the zone substation – approx. 50m x 50m.
- Access road.

The proponent engaged AREA Environmental & Heritage Consultants (AREA) to complete an ecological impact assessment in the land subject to the proposal (subject site). The proposal will be assessed under Part 5, Division 5.1 of the *Environmental Planning and Assessment Act 1979*. This report considers the relevant requirements under the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act), *Biodiversity Conservation Act 2016* (BC Act) and NSW *Fisheries Management Act 1994* (FM Act).

1.1 Location

The subject site is located in Thrumster NSW and is part of the Port Macquarie - Hastings Local Government Area. The subject site is zoned and mapped as 'Public Recreation' (RE1) on the NSW Planning Portal Spatial Viewer. The subject site is bound by the Thrumster Street easement to the north, Partridge Creek to the west and the existing Transgrid 132 / 33kV plant to the east. The location of the proposal is shown in Figure 1-1 and 1-4.

The proposal includes the assumption all existing vegetation within the property boundary will be cleared for development, including a batter around the site to provide an impact buffer and access road. The subject site is defined as a 10-metre buffer around all the proposed line and pole work.

Figure 1-1: The proposal

Figure 1-2: STS infrastructure proposal

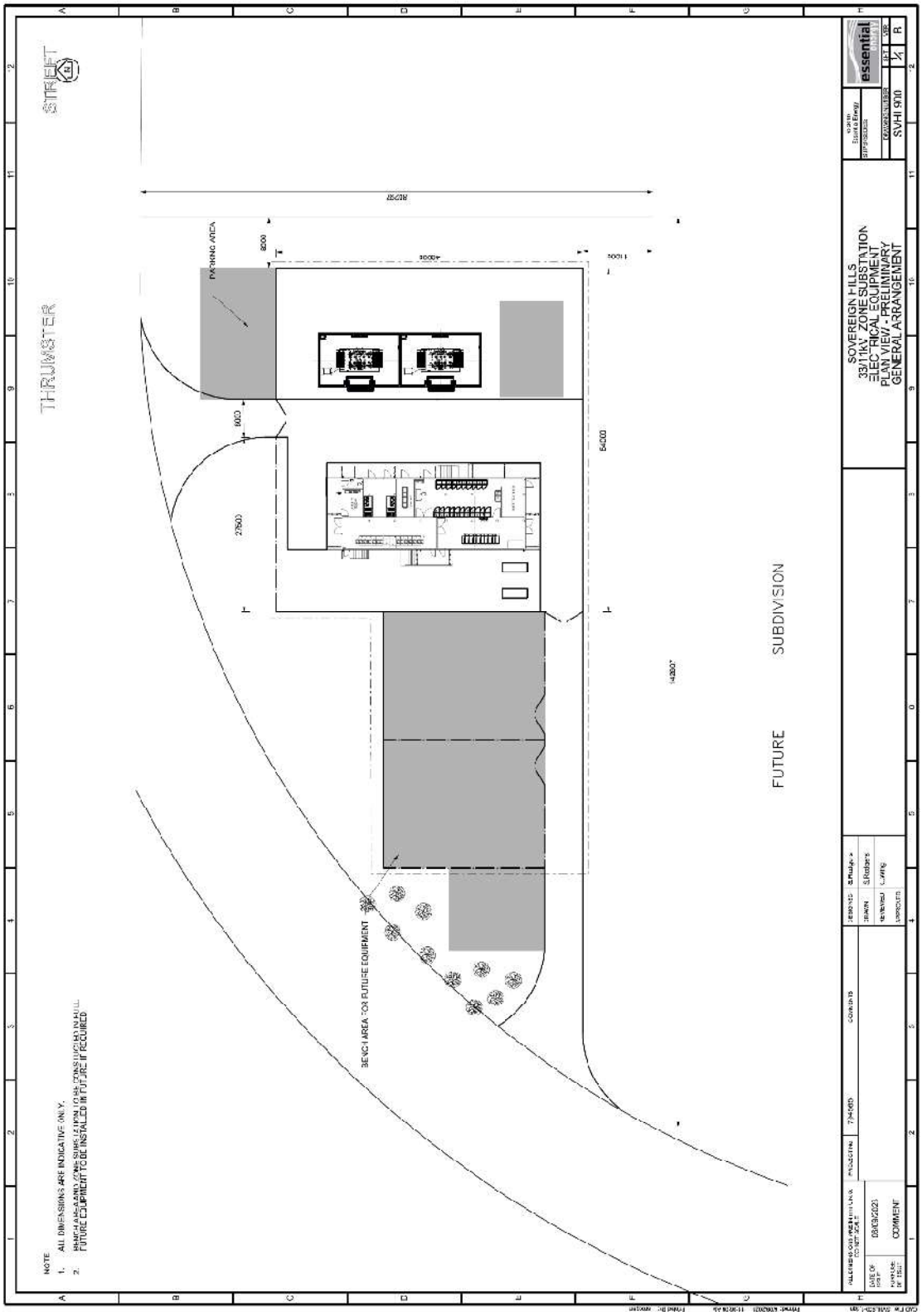


Figure 1-3: Proposed site access options. Only one access option is proposed (ROAD01) in plans below.

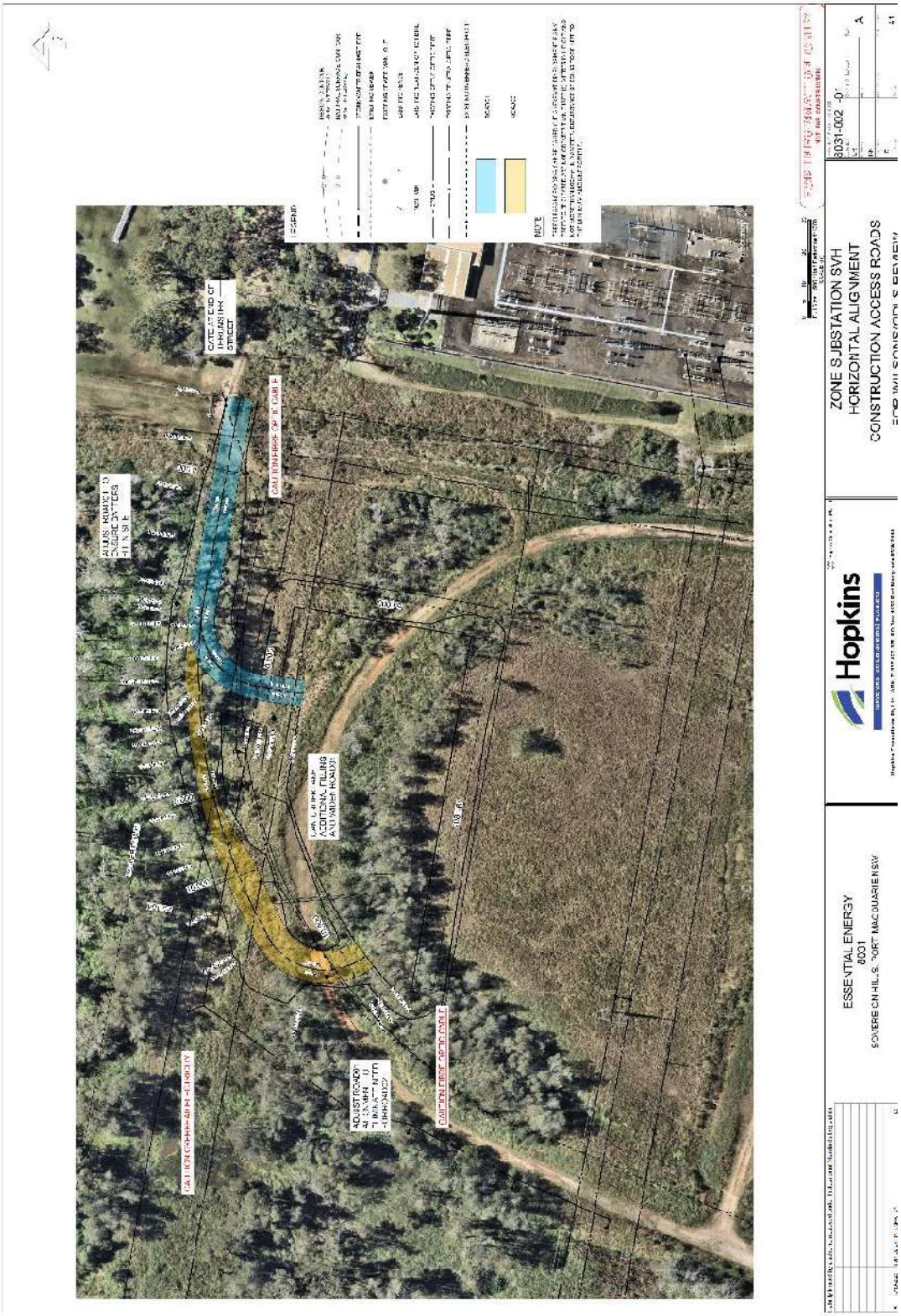
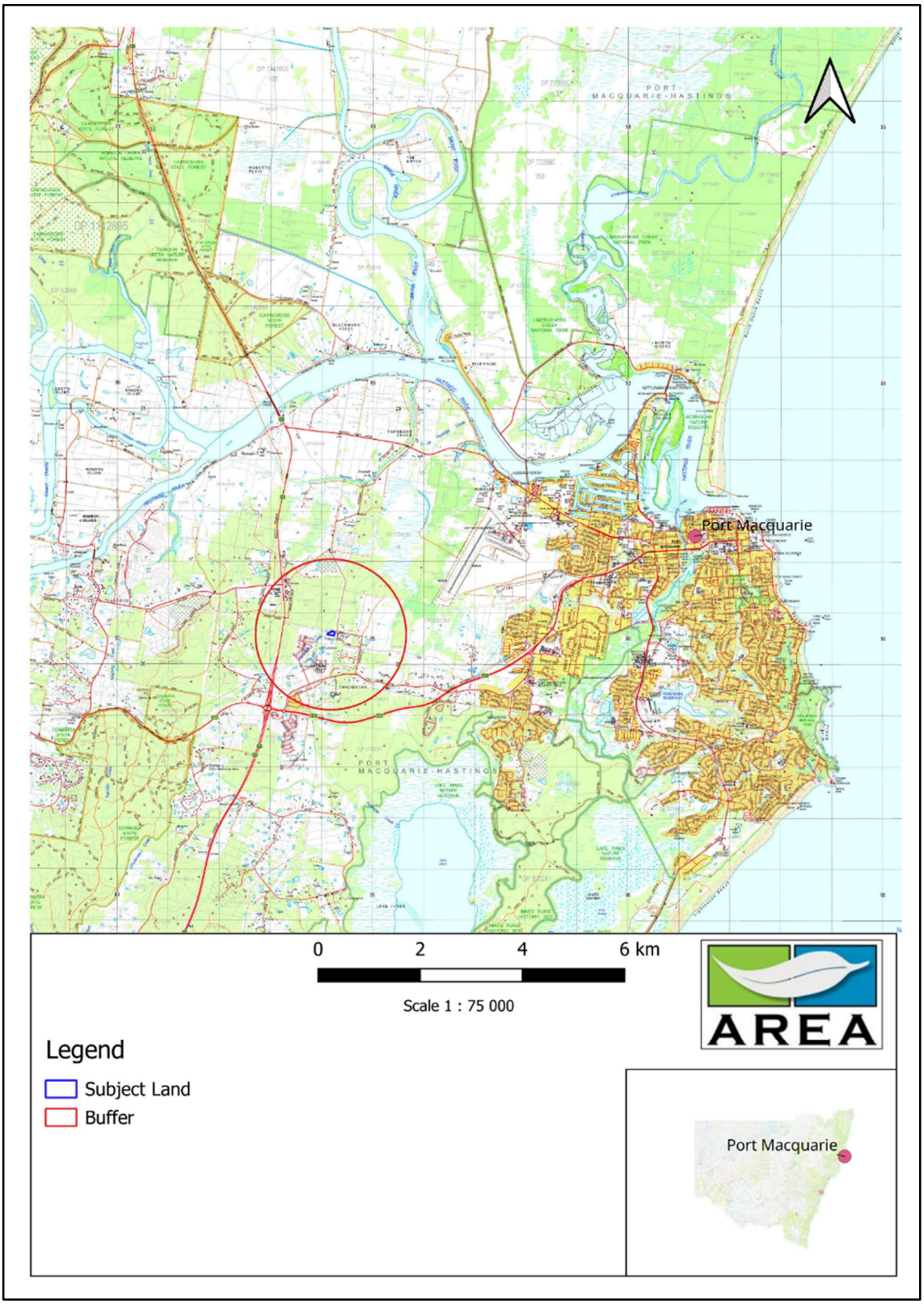


Figure 1-4: Location of the proposal



2. Landscape context and desktop assessment

The subject site comprises native and non-native vegetation (trees, grasses, forbs). A well-defined corridor of existing native vegetation follows an east to west axis across the central portion of the subject site.

Proposed site access includes removing existing vegetation within the Thrumster Street undeveloped easement. Vegetation within this area is connected to a larger adjoining remnant vegetation patch. Approximately 65% of the subject site has been cleared with no apparent existing tree or shrub layer.

2.1 Landscape context

The subject site is within the NSW North Coast bioregion and the North Coast Macleay Hastings IBRA subregion. The subject site is also within the Port Macquarie Hastings Local Government Area. One Third Strahler Order waterway is located adjacent to the western property boundary of the subject site and provides a catchment area for on-site drainage.

2.2 State Vegetation Mapping

The State Vegetation Map: 'NSW Extant PCT vC1.1.M1' PCT map sourced from the NSW SEED website[1], was used as a baseline for determining the Plant Community Types (PCTs) potentially occurring in the impact footprint (Figure 2-1).

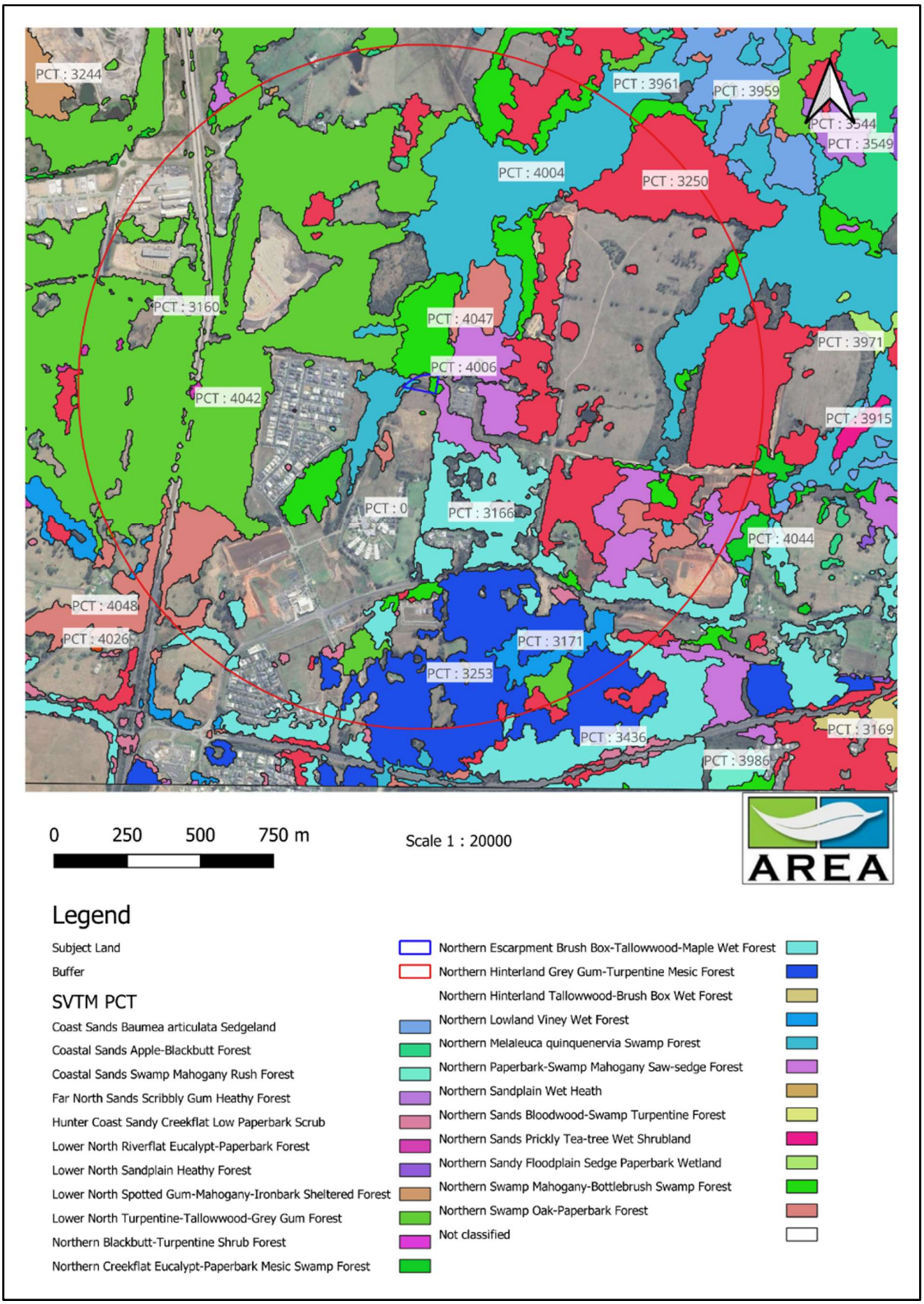
PCTs mapped on the above-mentioned spatial layer within 1500 metres of the proposed construction work include:

- PCT 3160 - Lower North Turpentine-Tallowwood-Grey Gum Forest
- PCT 3166 - Northern Escarpment Brush Box-Tallowwood-Maple Wet Forest
- PCT 3171 - Northern Lowland Viney Wet Forest
- PCT 3250 - Northern Foothills Blackbutt Grassy Forest
- PCT 3436 - Hunter Coast Sandy Creekflat Low Paperbark Scrub
- PCT 3544 - Coastal Sands Apple-Blackbutt Forest
- PCT 3959 - Coast Sands Baumea articulata Sedgeland
- PCT 3971 - Northern Sandy Floodplain Sedge Paperbark Wetland
- PCT 4004 - Northern Melaleuca quinquenervia Swamp Forest
- PCT 4006 - Northern Paperbark-Swamp Mahogany Saw-sedge Forest
- PCT 4047 - Northern Swamp Mahogany-Bottlebrush Swamp Forest
- PCT 4048 - Northern Swamp Oak-Paperbark Forest.

No PCTs are mapped on the subject site, however remnant vegetation occurring on site is likely contiguous with adjacent mapped vegetation. Impacted PCTs for the proposed site access option via the Thrumster Street easement involves the removal of vegetation within the area immediately north of the subject site. This vegetation is mapped as PCT 4047.

[1] https://datasets.seed.nsw.gov.au/dataset/nsw-state-vegetation-type-map

Figure 2-1: State Vegetation Map



2.3 Predicted Threatened Ecological Communities

Nine Threatened Ecological Communities (TEC) were predicted to occur in the NSW North Coast Bioregion – Macleay-Hastings IBRA subregion:

- Lowland Rainforest on Floodplain in the New South Wales North Coast Bioregion – Listed as Endangered under the BC Act.
- Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions – Listed as Endangered under the BC Act.
- Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions – Listed as Endangered under the BC Act.
- Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions – Listed as Endangered under the BC Act.
- Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions – Listed as Endangered under the BC Act.
- Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion – Listed as Endangered under the BC Act.
- Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregion – Listed as Endangered under the BC Act
- Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions – Listed as Endangered under the BC Act.
- Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions – Listed as Endangered under the BC Act.

Mapped TECs in the Port Macquarie Hastings LGA Vegetation and EEC (Maps 2014 VIS IDs 4205 and 4206) did not identify a TEC in the subject site.

Five TECs were predicted in the EPBC Act Protected Matters Report:

- Coastal Swamp Oak (casuarina glauca) Forest of new South Wales and South-east Queensland Ecological community – Listed as Endangered under the EPBC Act
- Littoral Rainforest and Coastal Vine Thickets of Eastern Australia – Listed as Critically Endangered under the EPBC Act
- New England Peppermint (Eucalyptus nova-anglica) Grassy Woodlands – Listed as Critically Endangered under the EPBC Act
- Subtropical and Temperate Coastal Saltmarsh – Listed as Vulnerable under the EPBC Act
- Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions – Listed as Endangered under the EPBC Act

2.4 BioNet species records

Eighteen listed plant and animal species have been recorded on BioNet within 1500 metres of the proposal (Figure 2-2). These include:

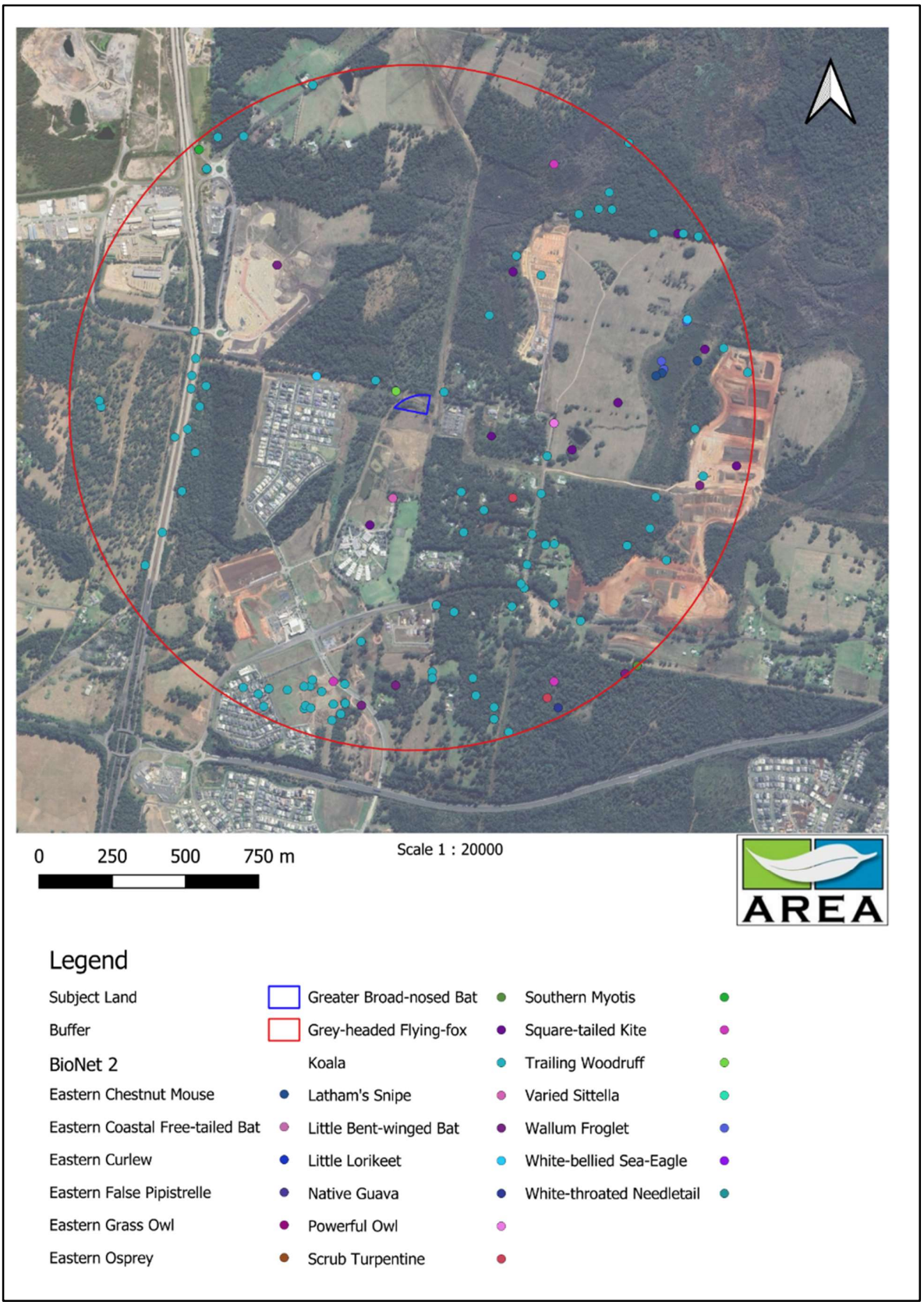
- Eastern Chestnut Mouse – Listed as Vulnerable under the BC Act
- Eastern Osprey – Listed under the EPBC Act
- Greater Broad Nose Bat – Listed as Vulnerable under the BC Act

- Grey Headed Flying Fox – Listed as Vulnerable under the BC Act and EPBC Act
- Koala – Listed as Endangered under the BC Act and EPBC Act
- Latham's Snipe – Listed under the EPBC Act
- Little Bent Wing Bat – Listed as Vulnerable under the BC Act
- Little Lorikeet – Listed as Vulnerable under the BC Act
- Native Guava – Listed as Critically Endangered under the BC Act and EPBC Act
- Powerful Owl – Listed as Vulnerable under the BC Act
- Scrub Turpentine – Listed as Critically Endangered under the BC Act and EPBC Act
- Southern Myotis – Listed as Vulnerable under the BC Act
- Square Tailed Kite – Listed as Vulnerable under the BC Act
- Trailing Woodruff – Listed as Vulnerable under the BC Act
- Varied Sittella – Listed as Vulnerable under the BC Act
- White Bellied Sea Eagle – Listed as Vulnerable under the BC Act
- White Throated Needle Tail – Listed as Vulnerable under the EPBC Act
- Wallum Froglet – Listed as Vulnerable under the BC Act

2.5 Predicted threatened species

A list of predicted threatened species has been generated by combining the NSW threatened species list based on the IBRA subregion, and the list within the EPBC Act Protected Matters Report (Appendix A).

Figure 2-2: BioNet records within 1500m of proposed augmentation alignment



3. Field results and impact assessment

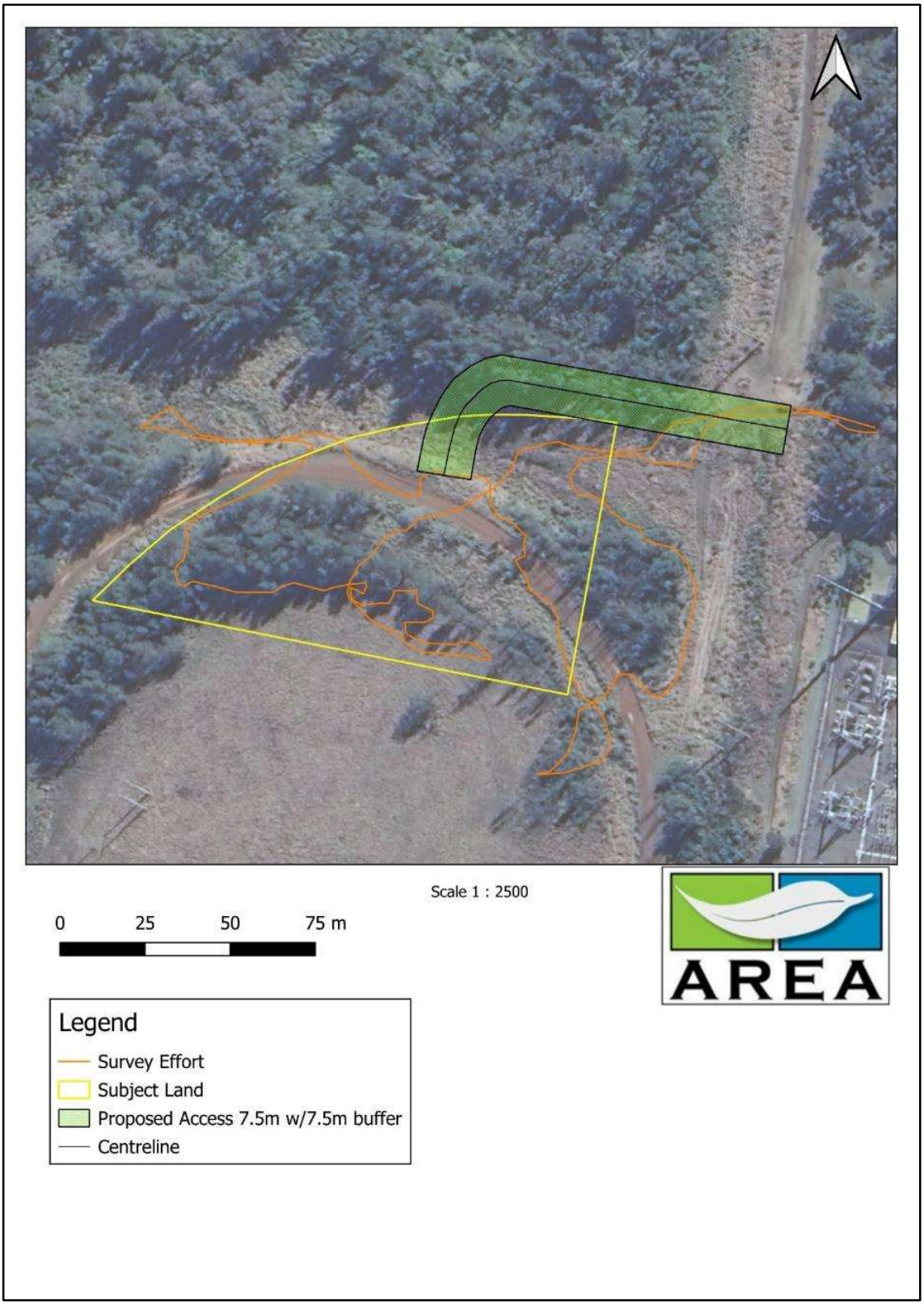
The field component of this assessment was undertaken on 27 September 2023 by Des Andersen. The proposed road access option was not assessed in the field (added to the project post assessment). However, sufficient data was collected during the field assessment and taking a conservative approach to species/community presence/absence (i.e., assuming species / communities to be present) that this was not a significant constraint in the assessment.

The aim of the assessment was to describe the subject site and nature and extent of impacts from the proposal on native vegetation, threatened species, populations, or communities under the EPBC, BC, or FM Acts.

Database searches were used to inform the field assessment through the identification of predicted species, plant community types and any associated threatened ecological communities with potential to occur in the impact footprint. The field assessment using pedestrian survey methods was used to verify these and identify any habitat constraints (Figure 3-1). A 10-metre buffer either side of the survey line (Figure 3-1) was assessed.

Using both database and field observations, the likelihood of impact on protected matters was determined, and where required a 'test' and or 'assessment' of significance undertaken to determine if a significant impact on protected matters from the proposal was likely. Results are presented in the sections below.

Figure 3-1: Survey effort



3.1 Vegetation

Native vegetation likely to be impacted by the proposal is noted in Figure 3-2.

The subject site (0.80 hectares) and proposed access road (0.18 hectares) will require clearing to facilitate the development of a new ZS (total 0.98 hectares).

Approximately 0.52 hectares of the subject site and 0.09 hectares of the proposed road corridor has been cleared through prior activity. Under this proposal, the total amount of vegetation to be cleared in the subject site and proposed access road is approximately 0.25 hectares of PCT 4004 (Northern Melaleuca quinquenervia Swamp Forest) and 0.12 hectares of PCT 4047 (Northern Swamp Mahogany-Bottlebrush Swamp Forest).

Approximately 10-15% of the upper stratum Swamp Oak (*casuarina glauca*) species within PCT 4004 are in poor condition as a result of dieback (Plate 3-1 and 3-2). The majority of vegetation within the cleared area consists of invasive Whiskey Grass (*Andropogon virginicus*). The natural topography of the subject site and its extant ecological community has been impacted through prior landscape modification works. Limited areas of native plant regeneration, consisting mainly of callistemon, leptospermum and melaleuca shrub species with Tall Saw-sedge (*Gahnia clarkei*), Blady Grass (*Imperata cylindrica*) and Themeda scattered sparsely throughout this area.

Three exotic species were recorded, including; Whisky Grass (*Andropogon virginicus*), Wild Tobacco Bush (*Solanum mauritianum*) and Common Lantana (*Lantana camara*). All three species above are listed as priority weed species under the current Port Macquarie Hastings Biosecurity Management Plan.

The subject site is not identified as a previously mapped TEC, however, PCT 4004 and PCT 4047 are associated with four threatened ecological communities (Table 3-1).

Table 3-1: Plant Community Type and alignment with State and Federal Endangered and Threatened Ecological Communities that may be present in the subject site.

PCT no.	Associated State EEC (BC Act)	Associated Federal TEC (EPBC Act)
4047	*Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Not Listed
4004	Not listed	*Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland*
4004 and 4047	*Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	Not listed
Considered for both PCT 4004 and PCT 4047 (despite neither community being specifically listed as aligning with this TEC)	Not listed.	*Coastal Swamp Oak (casuarina glauca) Forest of new South Wales and South-east Queensland Ecological community.* PMVC7(Swamp Oak Coastal Floodplain Wetland Forest) and PMVC71 (Swamp Oak-Mixed Eucalypt Coastal Floodplain Wetland Forest Complex) are map units that may contain the EPBC listed community. These map units are also equivalent to NSW listed *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin* and *South East Corner Bioregions*

The vegetation patches in the subject site mapped as PCT 4004 and PCT 4047 are not clear-cut and the boundaries between the two likely intergrade.

The BC Act listing guidelines for *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregion* identify PCT 4047 as part of the TEC. Thus, a Test of Significance (Appendix B) was prepared due to the dominance of *casuarina glauca*. Likewise, PCT 4004 and PCT 4047 are included in the BC Act listing for *Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*, and as such a test of significance for this TEC was also prepared (Appendix B).

PCT 4004 and PCT 4047 do not meet the patch size requirement for listing under the EPBC Act listed *Coastal Swamp Oak (casuarina glauca) Forest of New South Wales and South-east Queensland Ecological community* (Table 3-2). As the ecological community existing within the subject site is a small contiguous patch (size < 0.5 hectares), has been cleared

and modified, with a non-native ground layer it does not contribute greatly to the conservation of the ecological community. **This vegetation therefore does not meet the condition thresholds ('not protected') for national protection as this TEC.**

PCT 4004 is a proposed NSW PCT that aligns with Department of Agriculture Water and Environment Conservation Advice for the *Coastal Swamp Sclerophyll Forests* as of 10 February 2021 - In effect under the *Environment Protection and Biodiversity Conservation Act 1999* from 8 December 2021. As the ecological community existing within the subject site is a small contiguous patch (size < 0.5 hectares), has been cleared and modified, with a non-native ground layer it does not contribute greatly to the conservation of the ecological community. **This vegetation therefore does not meet the condition thresholds ('not protected') for national protection as this TEC** (Table 3-3).

The tests of significance undertaken for the two BC Act listed TECs, potentially occurring at the subject site confirmed the proposal is unlikely to have a significant impact on TECs.

Figure 3-2: Mapped vegetation

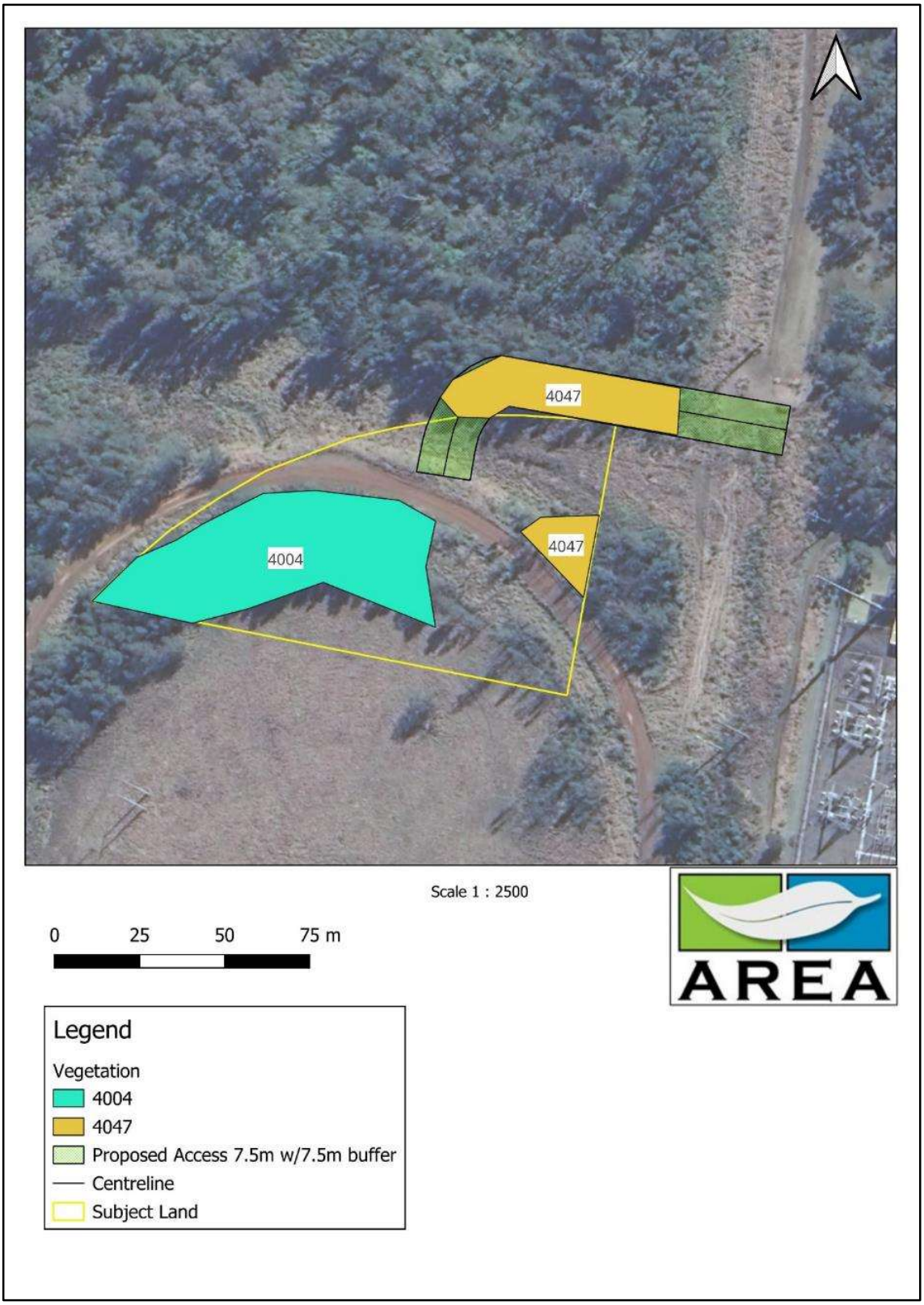


Table 3-1: Condition classes, categories, and thresholds of Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community to meet EPBC Act listing conditions [2]

Condition thresholds Patch size classes➔ ➔ Vegetation quality classes	**Large patch** The patch is at least 5 ha	**Medium patch** The patch is at least 2 ha and less than 5 ha	**Small contiguous** patch** The patch is at least 0.5 ha and less than 2 ha, and is connected to a larger area of native vegetation of at least 5 ha	**Small patch** The patch is at least 0.5 ha and less than 2 ha
HIGH QUALITY **Predominantly native understorey** Non-native species comprise **less than 20%** of total understorey vegetation cover*	CATEGORY A A large patch that meets **key diagnostics** and has a predominantly native understorey	CATEGORY B A medium patch that meets **key diagnostics** and has a predominantly native understorey OR A small patch that meets **key diagnostics** and has a predominantly native understorey and is contiguous** with another large area of native vegetation		CATEGORY C A small patch that meets **key diagnostics** and has a predominantly native understorey
GOOD QUALITY **Mostly native understorey** Non-native species comprise **less than 50%** of total understorey vegetation cover* AND transformer species*** comprise **less than 30%** of total understorey vegetation cover*	CATEGORY B A large patch that meets **key diagnostics** and has a mostly native understorey	CATEGORY C A medium patch that meets **key diagnostics** and has a mostly native understorey OR A small patch that meets **key diagnostics** and has a mostly native understorey and is contiguous** with another large area of native vegetation		
MODERATE QUALITY **Some native understorey** Non-native species comprise **less than 80%** of total understorey vegetation cover* AND transformer species*** comprise **less than 50%** of total understorey vegetation cover*	CATEGORY C A large or medium patch that meets **key diagnostics** and has some native understorey			

*Refers to total perennial understorey vegetation cover for the patch of the ecological community. Includes vascular plant species of all layers below the canopy with a life-cycle of more than two growing seasons. It includes herbs (graminoids and forbs), grasses, shrubs and juvenile plants of canopy species, but does not include annual plants, cryptogams, plant litter or exposed soil. Areas of little to no understorey vegetation cover (e.g. plant litter) are included if key diagnostics are met and non-native species are below thresholds.
**Contiguous means the patch is connected or in close proximity (within 30 m) to another area of native vegetation.
***Transformer species (e.g. *Chrysanthemoides monilifera, Asparagus* spp, *Pennisetum* spp, *Ipomoea* spp. etc.) are non-native plant species with the potential to permanently change the character, condition, form or nature of patches of the ecological community. See p. 43 for further information on weeds, including transformer species. Annual weeds, such as *Symphyotrichum subulatum* (saltmarsh aster), may be seasonally very abundant and temporarily restrict the development of native species, but would not be counted as transformer weeds in determining condition.

[2] https://www.environment.gov.au/biodiversity/threatened/communities/pubs/141-conservation-advice.pdf

Table 3-2: Condition classes, categories, and thresholds of Coastal Swamp Sclerophyll Forest of New South Wales And South East Queensland Ecological Community to meet EPBC Act listing conditions [3]

Patch size thresholds → Biotic thresholds ↓	Large patch The patch is at least 5 ha. It may or may not be contiguous with other native vegetation.	Medium patch The patch is at least 2 ha and less than 5 ha. It may or may not be contiguous with other native vegetation.	Small contiguous patch The patch is at least 0.25 ha and less than 2 ha and is part of a larger area of native vegetation of at least 5 ha.	Small patch The patch is at least 0.5 ha and less than 2 ha which is isolated or part of a small native vegetation remnant less than 5 ha in total.
HIGH CONDITION Non-native species comprise < 20% of total ground layer vegetation cover*	CLASS A A large patch that meets key diagnostics AND has a predominantly native ground layer.	CLASS B1 A medium patch that meets key diagnostics AND has a predominantly native ground layer.	CLASS B2 A small patch that meets key diagnostics AND has a predominantly native ground layer AND is contiguous** with another large area of native vegetation.	CLASS C1 A small patch which meets key diagnostics AND has a predominantly native ground layer.
GOOD CONDITION Non-native species comprise 20% to 50% of total ground layer vegetation cover*	CLASS B1 A large patch that meets key diagnostics AND the ground layer is mostly native.	CLASS C1 A medium patch that meets key diagnostics AND the ground layer is mostly native.	CLASS C2 A small patch that meets key diagnostics AND has a mostly native ground layer AND is contiguous** with another large area of native vegetation.	CLASS C2 A small patch that meets key diagnostics AND has a mostly native ground layer.
MODERATE CONDITION Non-native species comprise 50% - 80% of total ground layer vegetation cover*	CLASS C1 A large patch which meets key diagnostics AND the ground layer has at least 20% native vegetation cover.	CLASS C2 A medium patch that meets key diagnostics AND the ground layer has at least 20% native vegetation cover.	Not protected	Not protected
LOW CONDITION Non-native species comprise more than 80% of total ground layer vegetation cover*	CLASS C2 A large patch which meets key diagnostics, but the ground layer has low native vegetation cover.	Not protected	Not protected	Not protected

*Refers to total perennial ground layer vegetation cover for the patch of the ecological community. Includes vascular plant species with a lifecycle of more than two growing seasons. It includes herbs (graminoids and forbs), grasses, shrubs, and juvenile plants of canopy species, but does not include annual plants, cryptogams, leaf litter or exposed soil.

**Contiguous means the patch is connected or within 30 m of another area of native vegetation.

See Appendix B for further information on non-native/invasive alien plants associated with the Coastal Swamp Sclerophyll Forest.

[3] http://www.environment.gov.au/biodiversity/threatened/communities/pubs/171-conservation-advice.pdf

3.2 Threatened Species and habitat values

No threatened flora or fauna were observed during the field assessment.

Habitat values for threatened species were limited given the small extent of the subject area and the impact from previous clearing. The subject site is likely to provide feeding or resting habitat to some threatened species such as the Glossy Black Cockatoo. Other threatened species such as the Koala may use the subject site sporadically, when passing through the subject site to access larger adjacent patches of remnant forest. The lack of hollow bearing trees precludes most hollow-dependent species from occurring, likewise the lack of flowering eucalyptus precludes the presence of nectar dependant woodland birds.

Existing vegetation consistent with the species composition for PCT 4004 and PCT 4047 has the potential to provide limited habitat for the predicted threatened species provided in Table 3-3. The table is based on the:

- IBRA subregion (Macleay - Hastings) predicted species list
- threatened species and populations identified in the EPBC Act Protected Matters Report if the matter was not already identified in the NSW IBRA list
- BioNet Species Sighting records if the matter was not already identified in the IBRA list.

Where a species was identified as potentially being impacted by the proposal, a ‘test’ and or an ‘assessment’ of significance under the BC Act and or the EPBC Act was undertaken (Appendix B). Field assessment results, professional judgement, species specific information and the precautionary principle were applied in determining this requirement.

Tests and Assessments of significance confirmed the proposal is unlikely to have a significant impact on listed species or populations.

Table 3-1: Threatened Species – likelihood of impact by the proposal

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
Amphibians							
Crinia tinnula	Wallum Froglet	V	Not Listed	Wallum Froglets are found along the coastal margin from Litabella National Park in south-east Queensland to Kurnell in Sydney.	Unlikely. This species has been recorded in or nearby the subject site. However, disturbance to the subject site likely precludes its presence.	No	No
Litoria aurea	Green and Golden Bell Frog	E	V	Formerly distributed from the NSW north coast near Brunswick Heads, southwards along the NSW coast to Victoria where it extends into east Gippsland. Records from west to Bathurst, Tumut and the ACT region. Since 1990 there have been approximately 50 recorded locations in NSW, most of which are small, coastal, or near coastal populations. These locations occur over the species' former range, however they are widely separated and isolated. Large populations in NSW are located around the metropolitan areas of Sydney, Shoalhaven and mid north coast (one an island population). There is only one known population on the NSW Southern Tablelands.	Unlikely. This species has been recorded in or nearby the subject site. However, disturbance to the subject site likely precludes its presence.	No	No
Litoria booroolongensis	Booroolong Frog	E	E	The Booroolong Frog is restricted to NSW and north-eastern Victoria, predominantly along the western-flowing streams of the Great Dividing Range. It has disappeared from much of the Northern Tablelands, however several populations have recently been recorded in the Namoi catchment. The species is rare throughout most of the remainder of its range.	Unlikely.	No	No
Litoria brevipalmata	Green-thighed Frog	V	Not Listed	Isolated localities along the coast and ranges from just north of Wollongong to south-east Queensland.	Unlikely. This species has been recorded in or nearby the subject site. However, disturbance to the subject site likely	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
					precludes its presence.		
Litoria daviesae	Davies' Tree Frog	V	Not Listed	Davies' Tree Frog occurs as a series of small populations along the eastern escarpment of the Great Divide and adjacent tablelands above 400 m elevation. Its habitat is highly fragmented and restricted to the region from Carrai Plateau to the Barrington Tops area.	Unlikely.	No	No
Mixophyes balbus	Stuttering Frog	E	V	Stuttering Frogs occur along the east coast of Australia from southern Queensland to north-eastern Victoria. Considered to have disappeared from Victoria and to have undergone considerable range contraction in NSW, particularly in south-east NSW. It is the only Mixophyes species that occurs in south-east NSW and in recent surveys it has only been recorded at three locations south of Sydney. The Dorrigo region, in north-east NSW, appears to be a stronghold for this species.	Unlikely.	No	No
Mixophyes iteratus	Giant Barred Frog	E	E	The Giant Barred Frog is distributed along the coast and ranges from Eumundi in south-east Queensland to Warrimoo in the Blue Mountains. Declines appear to have occurred at the margins of the species' range, with no recent records south of the Hawkesbury River and disappearances from a number of streams in QLD. Northern NSW, particularly the Coffs Harbour-Dorrigo area, is a stronghold.	Unlikely.	No	No
Philoria sphagnicolus	Sphagnum Frog	V	V	The Sphagnum Frog occurs as a series of fragmented populations along the eastern escarpment of the Great Dividing Range in north-east NSW from Chaelundi State Forest south to Killabakh Nature Reserve near Comboyne.	Unlikely.	No	No
Bats							
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	Found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. It is generally rare with a very patchy distribution in NSW. There are scattered records from the New England Tablelands and North West Slopes.	Unlikely to occur in subject site.	No	No
Chalinolobus nigrogriseus	Hoary Wattled Bat	V	Not Listed	Widely distributed across northern Australia although absent from the arid centre. In north east NSW it extends	Possible habitat / foraging habitat may	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
				from Port Macquarie in the south, north to the Queensland border. The species has been recorded as far west as Armidale and Ashford.	occur in the subject site		
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V	Not Listed	The Eastern False Pipistrelle is found on the south-east coast and ranges of Australia, from southern Queensland to Victoria and Tasmania.	Likely to occur in the subject site	Possible	Yes
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	V	Not Listed	The Eastern Freetail-bat is found along the east coast from south Queensland to southern NSW.	Likely to occur in the subject site	Possible	Yes
Miniopterus australis	Little Bent-winged Bat	V	Not Listed	East coast and ranges of Australia from Cape York in Queensland to Wollongong in NSW.	Unlikely. Potential foraging habitat, no roosting habitat.	Possible	Yes
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	Not Listed	Eastern Bentwing-bats occur along the east and north-west coasts of Australia.	Unlikely. Potential foraging habitat, no roosting habitat.	Possible	Yes
Myotis macropus	Southern Myotis	V	Not Listed	The Southern Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers.	Unlikely. Potential foraging habitat, no roosting habitat.	Possible	Yes
Nyctophilus bifax	Eastern Long-eared Bat	V	Not Listed	Found from Cape York through eastern Queensland to the far north-east corner of NSW. In NSW they appear to be confined to the coastal plain and nearby coastal ranges, extending south to the Clarence River area, with a few records further south around Coffs Harbour. The species can be locally common within its restricted range.	Unlikely to occur in the subject site	Possible	Yes
Phoniscus papuensis	Golden-tipped Bat	V	Not Listed	The Golden-tipped Bat is distributed along the east coast of Australia in scattered locations from Cape York Peninsula in Queensland to south of Eden in southern NSW. It has recently been trapped just inside the Victorian border. It also occurs in New Guinea.	Unlikely. Dense subtropical / rainforest habitat does not occur in the subject site	No	No
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	Grey-headed Flying-foxes are generally found within 200 km of the eastern coast of Australia, from Rockhampton in Queensland to Adelaide in South Australia. In times of natural resource shortages, they may be found in unusual locations.	Unlikely. Previously recorded on or near the subject site. Not recorded and no suitable habitat (roosting trees) occurs on the subject site.	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	Not Listed	The Yellow-bellied Sheathtail-bat is a wide-ranging species found across northern and eastern Australia. In the most southerly part of its range - most of Victoria, south-western NSW and adjacent South Australia - it is a rare visitor in late summer and autumn. There are scattered records of this species across the New England Tablelands and North West Slopes.	Possible habitat / foraging habitat may occur in the subject site	Possible	Yes
Scoteanax rueppellii	Greater Broad-nosed Bat	V	Not Listed	The Greater Broad-nosed Bat is found mainly in the gullies and river systems that drain the Great Dividing Range, from north-eastern Victoria to the Atherton Tableland. It extends to the coast over much of its range. In NSW it is widespread on the New England Tablelands, however does not occur at altitudes above 500 m.	Possible habitat / foraging habitat may occur in the subject site	Possible	Yes
Syconycteris australis	Common Blossom-bat	V	Not Listed	Coastal areas of eastern Australia from Hawks Nest in NSW to Cape York peninsula in Queensland. In areas, the distribution extends inland to coastal foothills.	Unlikely. Not recorded and no suitable habitat occurs on the subject site.	No	No
Vespadelus troughtoni	Eastern Cave Bat	V	Not Listed	The Eastern Cave Bat is found in a broad band on both sides of the Great Dividing Range from Cape York to Kempsey, with records from the New England Tablelands and the upper north coast of NSW. The western limit appears to be the Warrumbungle Range, and there is a single record from southern NSW, east of the ACT.	Unlikely. Potential foraging habitat, no roosting habitat.	Possible	Yes
Birds							
Actitis hypoleucos	Common Sandpiper	Not Listed	Listed	Found along all coastlines of Australia and in many areas inland, the Common Sandpiper is widespread in small numbers.	No. Not recorded. Suitable wetland habitat is not present.	No	
Amaurornis moluccana	Pale-vented Bush-hen	V	Not Listed	In Australia, the Pale-vented Bush-hen occurs mainly in coastal and subcoastal regions from the Top End of the Northern Territory and Cape York Peninsula south through eastern Queensland to north-eastern NSW. There are a few records in the Kimberley Division of northern Western Australia. In NSW, Bush-hens are an apparently uncommon resident from the Queensland border south to the Clarence River, though the species appears to be expanding its range southwards with recent records as far south as the Nambucca River. The	Possible.	Possible	Yes

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
				Pale-vented Bush-hen inhabits tall dense understorey or ground-layer vegetation on the margins of freshwater streams and natural or artificial wetlands, usually within or bordering rainforest, rainforest remnants or forests. Also occur in secondary forest growth, rank grass or reeds, thickets of weeds, such as Lantana (Lantana camara), and pastures, crops or other farmland, such as crops of sugar cane, and grassy or weedy fields, or urban gardens where they border forest and streams or wetlands, such as farm dams. Can also occur in and around mangroves, though rarely do so, if at all, in NSW.			
Anseranas semipalmata	Magpie Goose	V	Not Listed	The Magpie Goose is still relatively common in the Australian northern tropics, but had disappeared from south-east Australia by 1920 due to drainage and overgrazing of reed swamps used for breeding. Since the 1980s there have been an increasing number of records in central and northern NSW. Vagrants can follow food sources to south-eastern NSW.	Unlikely. Inadequate extent of suitable habitat resulting from urban infringement.	No	No
Anthochaera phrygia	Regent Honeyeater	CE	CE	The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Birds are also found in drier coastal woodlands and forests in some years. Once recorded between Adelaide and the central coast of Queensland, its range has contracted dramatically in the last 30 years to between north-eastern Victoria and south-eastern Queensland. There are only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. In NSW the distribution is very patchy and mainly confined to the two main breeding areas and surrounding fragmented woodlands. In some years flocks converge on flowering coastal woodlands and forests.	Unlikely. Previously recorded on or near the subject site. However, no suitable habitat (foraging or roosting) exists on the subject site.		
Ardenna carneipes	Flesh-footed Shearwater	V	Not Listed	Ranges throughout the Pacific and Indian Oceans. There are two main breeding areas in the world: one in the South West Pacific includes Lord Howe Island and New Zealand; the other along the coast of Western Australia.	Unlikely.	No	No
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	Not Listed	Dusky woodswallows are widespread in eastern, southern and south western Australia. The species occurs throughout most of New South Wales, but is	Possible. Previously recorded on or near the subject site.	Possible	Yes

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
				sparsely scattered in, or largely absent from, much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range.			
Atrichornis rufescens	Rufous Scrub-bird	V	E	Rufous Scrub-birds are endemic to south-eastern Australia. The northern subspecies (A. r. rufescens) occurs between the Mistake Range in Queensland and the Gibraltar Range in northern NSW. The southern subspecies (A. r. ferrieri) is confined to NSW, with a patchy distribution from the Dorrigo Plateau to Barrington Tops. The species is now generally only found in high-rainfall areas above 600m in elevation, but formerly occurred in the lowlands of the Richmond and Tweed Rivers.	Unlikely	No	No
Botaurus poiciloptilus	Australasian Bittern	E	E	Australasian Bitterns are widespread but uncommon over south-eastern Australia. In NSW they may be found over most of the state except for the far north-west.	Possible. Previously recorded on or near the subject site. However, disturbance likely precludes this species from occurring.	No	No
Bubulcus ibris	Cattle Egret	Not Listed	Listed	The Cattle Egret breeds in colonies, either mono-specific or with other Egrets/Herons. In Australia the principal breeding sites are the central east coast from about Newcastle to Bundaberg. The Cattle Egret occurs in tropical and temperate grasslands, wooded lands and terrestrial wetlands. It has occasionally been seen in arid and semi-arid regions however this is extremely rare. High numbers have been observed in moist, low-lying poorly drained pastures with an abundance of high grass; it avoids low grass pastures. It has been recorded on earthen dam walls and ploughed fields.	Unlikely to occur. Mainly associates with cattle in the area.	No	No
Burhinus grallarius	Bush Stone-curlew	E	Not Listed	The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common however and in the south-east it is either rare or extinct throughout its former range.	Unlikely.	No	No
Calidris acuminata	Sharp-tailed Sandpiper	Not Listed	Listed	The Sharp-tailed Sandpiper spends the non-breeding season in Australia with small numbers occurring regularly in New Zealand. In Australasia, the Sharp-tailed	Unlikely. Previously recorded on or near the subject site. No	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
				Sandpiper prefers muddy edges of shallow fresh or brackish wetlands, with inundated or emergent sedges, grass, saltmarsh or other low vegetation. This includes lagoons, swamps, lakes and pools near the coast, and dams, waterholes, soaks, bore drains and bore swamps, saltpans and hypersaline saltlakes inland. They also occur in saltworks and sewage farms.	suitable habitat exists on the subject site.		
Calidris alba	Sanderling	V	Not Listed	A regular summer migrant from Siberia and other Arctic breeding grounds to most of the Australian coastline. It is uncommon to locally common, arriving from September and leaving by May (some may overwinter in Australia). Sanderlings occur along the NSW coast, with occasional inland sightings.	Unlikely. No suitable habitat exists on the subject site.	No	No
Calidris canutus	Red Knot, Knot	Not Listed	E	The Red Knot is a non-breeding migratory visitor from Arctic regions of Siberia. It is capable of flying non-stop between north-eastern China and northern Australia. Birds arrive between September and October and leave between March and April, with a small number of individuals overwintering. In NSW it is recorded in small numbers along some of the major river estuaries and sheltered embayments of the coastline, in particular the Hunter River estuary. This environment is used as a staging area for birds to rest and replenish fat resources; large numbers arrive in September then most move south to Victoria by October. The Red Knot is a rare visitor to wetlands away from the coast with a few records (mostly during southward migration) as far west as Lake Menindee and the Riverina.	Unlikely. No suitable habitat exists on the subject site.	No	No
Calidris ferruginea	Curlew Sandpiper	E	CE	The Curlew Sandpiper is distributed around most of the Australian coastline (including Tasmania). It occurs along the entire coast of NSW, particularly in the Hunter Estuary, and sometimes in freshwater wetlands in the Murray-Darling Basin. Inland records are probably mainly of birds pausing for a few days during migration. The Curlew Sandpiper breeds in Siberia and migrates to Australia (as well as Africa and Asia) for the non-breeding period, arriving in Australia between August and November, and departing between March and mid-April.	Unlikely. No suitable habitat exists on the subject site.	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
Calidris melanotos	Pectoral Sandpiper	Not Listed	Listed	In New South Wales (NSW), the Pectoral Sandpiper is widespread, but scattered. In Australasia, the Pectoral Sandpiper prefers shallow fresh to saline wetlands. The species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains and artificial wetlands. The species is usually found in coastal or near coastal habitat but occasionally found further inland. It prefers wetlands that have open fringing mudflats and low, emergent or fringing vegetation, such as grass or samphire. The species has also been recorded in swamp overgrown with lignum. They forage in shallow water or soft mud at the edge of wetlands (Higgins & Davies 1996).	Unlikely. No suitable habitat exists on the subject site.	No	No
Calidris tenuirostris	Great Knot	V	CE	In NSW, the species has been recorded at scattered sites along the coast down to about Narooma. It has also been observed inland at Tullakool, Armidale, Gilgandra and Griffith.	Unlikely. No suitable habitat exists on the subject site.	No	No
Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	V	V	The species is uncommon although widespread throughout suitable forest and woodland habitats, from the central Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina. An isolated population exists on Kangaroo Island, South Australia.	Likely to occur in the subject site. Previously recorded on or near the subject site. Casuarina and Allocasuarina provide foraging habitat.	Yes	Yes
Carterornis leucotis	White-eared Monarch	V	Not Listed	The species is endemic to the coastal lowlands and eastern slopes of the Great Divide of eastern Australia, extending from Cape York Peninsula south to north-eastern NSW. In NSW, White-eared Monarchs are generally found from the Queensland border south to Iluka at the mouth of the Clarence River, and inland as far as the Richmond Range. There are occasional records south of the Clarence River, near Woolgoolga and around Port Macquarie.	Possible.	Yes	No
Charadrius leschenaultii	Greater Sand-plover	V	V	The Greater Sand-plover breeds in central Asia from Armenia to Mongolia, moving further south for winter. In Australia the species is commonly recorded in parties of 10-20 on the west coast, with the far northwest being the stronghold of the population. The species is apparently rare on the east coast, usually found singly. In NSW, the	Unlikely.	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
				species has been recorded between the northern rivers and the Illawarra, with most records coming from the Clarence and Richmond estuaries.			
Charadrius mongolus	Lesser Sand-plover	V	E	The Lesser Sand-plover breeds in central and north eastern Asia, migrating further south for winter. In Australia the species is found around the entire coast but is most common in the Gulf of Carpentaria, and along the east coast of Queensland and northern NSW. Individuals are rarely recorded south of the Shoalhaven estuary, and there are few inland records.	Unlikely.	No	No
Chthonicola sagittata	Speckled Warbler	V	Not Listed	The Speckled Warbler has a patchy distribution throughout south-eastern Queensland, the eastern half of NSW and into Victoria, as far west as the Grampians. The species is most frequently reported from the hills and tablelands of the Great Dividing Range, and rarely from the coast. There has been a decline in population density throughout its range, with the decline exceeding 40% where no vegetation remnants larger than 100ha survive.	Unlikely.	No	No
Circus assimilis	Spotted Harrier	V	Not Listed	The Spotted Harrier occurs throughout the Australian mainland, except in densly forested or wooded habitats of the coast, escarpment and ranges, and rarely in Tasmania. Individuals disperse widely in NSW and comprise a single population.	Likely	Possible	Yes
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	Not Listed	The Brown Treecreeper is endemic to eastern Australia and occurs in eucalypt forests and woodlands of inland plains and slopes of the Great Dividing Range. It is less commonly found on coastal plains and ranges. The western boundary of the range of Climacteris picumnus victoriae runs approximately through Corowa, Wagga Wagga, Temora, Forbes, Dubbo and Inverell and along this line the subspecies intergrades with the arid zone subspecies of Brown Treecreeper Climacteris picumnus picumnus which then occupies the remaining parts of the state. The eastern subspecies lives in eastern NSW in eucalypt woodlands through central NSW and in coastal areas with drier open woodlands such as the Snowy River Valley, Cumberland Plains, Hunter Valley and parts of the Richmond and Clarence Valleys. The population density of this subspecies has been	Likely to occur in the subject site. Previously recorded on or near the subject site.	Possible	Yes

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
				greatly reduced over much of its range, with major declines recorded in central NSW and the northern and southern tablelands. Declines have occurred in remnant vegetation fragments smaller than 300 hectares, that have been isolated or fragmented for more than 50 years.			
Coracina lineata	Barred Cuckoo-shrike	V	Not Listed	Coastal eastern Australia from Cape York to the Manning River in NSW. Barred Cuckoo-shrikes are generally uncommon in their range, and are rare in NSW.	Unlikely	No	No
Daphoenositta chrysoptera	Varied Sittella	V	Not Listed	The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands. Distribution in NSW is nearly continuous from the coast to the far west. The Varied Sittella's population size in NSW is uncertain but is believed to have undergone a moderate reduction over the past several decades.	Likely to occur in the subject site	No	No
Dromaius novaehollandiae	Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area	EP	Not Listed	Coastal emus were once widespread across north-eastern New South Wales. Now, they live only within Evans Head, Red Rock and the Bungawalbin area.	Unlikely. Inadequate extent of suitable habitat resulting from urban infringement	No	No
Ephippiorhynchus asiaticus	Black-necked Stork	E	Not Listed	The species Ephippiorhynchus asiaticus comprises two subspecies, E. a. asiaticus in India and south-east Asia, and E. a. australis in Australia and New Guinea. In Australia, Black-necked Storks are widespread in coastal and subcoastal northern and eastern Australia, as far south as central NSW (although vagrants may occur further south or inland, well away from breeding areas). In NSW, the species becomes increasingly uncommon south of the Clarence Valley, and rarely occurs south of Sydney. Since 1995, breeding has been recorded as far south as Buladelah.	Unlikely.	No	No
Epthianura albifrons	White-fronted Chat	V	Not Listed	The White-fronted Chat is found across the southern half of Australia, from southernmost Queensland to southern Tasmania, and across to Western Australia as far north as Carnarvon. Found mostly in temperate to arid climates and very rarely sub-tropical areas, it occupies foothills and lowlands up to 1000 m above sea level. In NSW, it occurs mostly in the southern half of the state, in damp	Likely	Possible	Yes

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
				open habitats along the coast, and near waterways in the western part of the state. Along the coastline, it is found predominantly in saltmarsh vegetation but also in open grasslands and sometimes in low shrubs bordering wetland areas.			
Erythrotriorchis radiatus	Red Goshawk	CE	V	This unique Australian endemic raptor is distributed sparsely through northern and eastern Australia, from the western Kimberley Division of northern Western Australia to north-eastern Queensland and south to far north-eastern NSW, and with scattered records in central Australia. The species is very rare in NSW, extending south to about 30°S, with most records north of this, in the Clarence River Catchment, and a few around the lower Richmond and Tweed Rivers. Formerly, it was at least occasionally reported as far south as Port Stephens.	Unlikely.	No	No
Esacus magnirostris	Beach Stone-curlew	CE	Not Listed	In Australia, the Beach Stone-curlew occupies coastlines from about Point Cloates in Western Australia, across northern and north-eastern Australia south to north-eastern NSW, with occasional vagrants to south-eastern NSW and Victoria. In NSW, the species occurs regularly to about the Manning River, but recent records show a breeding pair is known from the Port Stephens area (Dowadee Island and Soldiers Point [mid-north coast]) and more recently the species has been recorded at Whale Beach in Twofold Bay near Eden. These new records extend the known limit of the normal range of the species in Australia to the far south coast of NSW. Surveys in 2000 put the NSW population at a minimum of 13 adult birds. Outside Australia, the species also occurs in south-eastern Asia, from the Malay Peninsula through Indonesia and southern New Guinea, east to the Solomon Islands, Vanuatu and New Caledonia.	Unlikely	No	No
Falco hypoleucos	Grey Falcon	V	V	The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. There are possibly less than 5000 individuals left. Population trends	Unlikely	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
				are unclear, though it is believed to be extinct in areas with more than 500mm rainfall in NSW.			
Gallinago hardwickii	Lathams Snipe	Not Listed	Listed	Latham's Snipe is a non-breeding visitor to south-eastern Australia. In Australia, Latham's Snipe occurs in permanent and ephemeral wetlands up to 2000 m above sea-level (Chapman 1969; Naarding 1981). They usually inhabit open, freshwater wetlands with low, dense vegetation (e.g. swamps, flooded grasslands or heathlands, around bogs and other water bodies) (Frith et. al. 1977; Naarding 1983; Weston 2006, pers. comm.).	Unlikely.	No	No
Glossopsitta pusilla	Little Lorikeet	V	Not Listed	The Little Lorikeet is distributed widely across the coastal and Great Divide regions of eastern Australia from Cape York to South Australia. NSW provides a large portion of the species' core habitat, with lorikeets found westward as far as Dubbo and Albury. Nomadic movements are common, influenced by season and food availability, although some areas retain residents for much of the year and 'locally nomadic' movements are suspected of breeding pairs.	Unlikely, due to the lack of suitable flowering gum trees.	No	No
Grantiella picta	Painted Honeyeater	V	V	The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. During the winter it is more likely to be found in the north of its distribution.	Unlikely, due to the lack of suitable flowering gum trees.	No	No
Grus rubicunda	Brolga	V	Not Listed	The Brolga was formerly found across Australia, except for the south-east corner, Tasmania and the south-western third of the country. It is still abundant in the northern tropics, but very sparse across the southern part of its range.	Unlikely.	No	No
Haematopus fuliginosus	Sooty Oystercatcher	V	Not Listed	Sooty Oystercatchers are found around the entire Australian coast, including offshore islands, being most common in Bass Strait. Small numbers of the species are evenly distributed along the NSW coast. The availability of suitable nesting sites may limit populations.	Unlikely.	No	No
Haematopus longirostris	Pied Oystercatcher	E	Not Listed	The species is distributed around the entire Australian coastline, although it is most common in coastal Tasmania and parts of Victoria, such as Corner Inlet. In NSW the species is thinly scattered along the entire	Unlikely.	No	No

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				coast, with fewer than 200 breeding pairs estimated to occur in the State. 'Pied' Oystercatchers are occasionally recorded on Lord Howe island but it is uncertain which species is involved.			
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	Not Listed	The White-bellied Sea-eagle is distributed around the Australian coastline, including Tasmania, and well inland along rivers and wetlands of the Murray Darling Basin. In New South Wales it is widespread along the east coast, and along all major inland rivers and waterways.	Possible	No	No
Hamirostra melanosternon	Black-breasted Buzzard	V	Not Listed	The Black-breasted Buzzard is found sparsely in areas of less than 500mm rainfall, from north-western NSW and north-eastern South Australia to the east coast at about Rockhampton, then across northern Australia south almost to Perth, avoiding only the Western Australian deserts.	Possible	No	No
Hieraaetus morphnoides	Little Eagle	V	Not Listed	The Little Eagle is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW.	Possible	Possible	Yes
Irediparra gallinacea	Comb-crested Jacana	V	Not Listed	The Comb-crested Jacana occurs on freshwater wetlands in northern and eastern Australia, mainly in coastal and subcoastal regions, from the north-eastern Kimberley Division of Western Australia to Cape York Peninsula then south along the east coast to the Hunter region of NSW, with stragglers recorded in south-eastern NSW (possibly in response to unfavourable conditions further north). Beyond Australia, the Comb-crested Jacana occurs from Borneo and the Phillippines, south and east through Sulawesi, the Moluccas and Lesser Sunda Islands, to the Aru Islands, New Guinea and New Britain.	Unlikely.	No	No
Ixobrychus flavicollis	Black Bittern	V	Not Listed	The Black Bittern has a wide distribution, from southern NSW north to Cape York and along the north coast to the Kimberley region. The species also occurs in the south-west of Western Australia. In NSW, records of the species are scattered along the east coast, with individuals rarely being recorded south of Sydney or inland.	Unlikely.	No	No

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Lathamus discolor	Swift Parrot	E	CE	Breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. In NSW mostly occurs on the coast and south west slopes.	Unlikely, due to the lack of suitable flowering gum trees.	No	No
Lichenostomus fasciogularis	Mangrove Honeyeater	V	Not Listed	The Mangrove Honeyeater is confined to the coastal fringe and offshore islands of eastern Australia, from Townsville, Queensland, south to the northern coast of NSW, where it may be expanding its range. It is common in Queensland but rare in NSW, where birds are found at several scattered localities. In NSW, most observations occur south to the Clarence River: around Tweed Heads, near Broken Head, and in the estuary of the Clarence River, near Iluka and Yamba. South of the Clarence, individuals or small numbers have been recorded around the mouth of the Macleay River between Stuarts Point and South West Rocks, and at Wauchope on the lower Hastings River.	Unlikely, due to the lack of suitable flowering gum trees.	No	No
Limicola falcinellus	Broad-billed Sandpiper	V	Not Listed	The eastern form of this species breeds in northern Siberia before migrating southwards in winter to Australia. In Australia, Broad-billed Sandpipers overwinter on the northern coast, particularly in the north-west, with birds located occasionally on the southern coast. In NSW, the main site for the species is the Hunter River estuary, with birds occasionally reaching the Shoalhaven estuary. There are few records for inland NSW.	Unlikely.	No	No
Limosa lapponica	Bar-tailed godwit	Not Listed	Listed	The Bar-tailed Godwit is a non-breeding immigrant to Australia and has been recorded in the coastal areas of all Australian states. It is widespread in the Torres Strait and along the east and south-east coasts of Queensland, NSW and Victoria, including the offshore islands. It is found south from Cooktown to Port Phillip Bay, but is less common west of the Bellarine Peninsula. There are a few inland records from NSW and Victoria. The Bar-tailed Godwit is found mainly in coastal habitats such as large intertidal sandflats, banks, mudflats, estuaries, inlets, harbours, coastal lagoons and bays.	Unlikely.	No	No
Limosa limosa	Black-tailed Godwit	V	Not Listed	The Black-tailed Godwit is a migratory wading bird that breeds in Mongolia and Eastern Siberia and flies to	Unlikely	No	No

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				Australia for the southern summer, arriving in August and leaving in March. In NSW, it is most frequently recorded at Kooragang Island (Hunter River estuary), with occasional records elsewhere along the coast, and inland. Records in western NSW indicate that a regular inland passage is used by the species, as it may occur around any of the large lakes in the western areas during summer, when the muddy shores are exposed. The species has been recorded within the Murray-Darling Basin, on the western slopes of the Northern Tablelands and in the far north-western corner of the state.			
Lophoictinia isura	Square-tailed Kite	V	Not Listed	The Square-tailed Kite ranges along coastal and subcoastal areas from south-western to northern Australia, Queensland, NSW and Victoria. In NSW, scattered records of the species throughout the state indicate that the species is a regular resident in the north, north-east and along the major west-flowing river systems. It is a summer breeding migrant to the south-east, including the NSW south coast, arriving in September and leaving by March.	Unlikely. However, species has been previously recorded nearby the study area.	No. Potential foraging areas.	Yes
Macronectes giganteus	Southern Giant Petrel	E	E	The Southern Giant Petrel has a circumpolar pelagic range from Antarctica to approximately 20° S and is a common visitor off the coast of NSW.	Does not occur in the study area.	No	No
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	V	Not Listed	The Hooded Robin is widespread, found across Australia, except for the driest deserts and the wetter coastal areas - northern and eastern coastal Queensland and Tasmania. However, it is common in few places, and rarely found on the coast. It is considered a sedentary species, but local seasonal movements are possible. The south-eastern form (subspecies cucullate) is found from Brisbane to Adelaide and throughout much of inland NSW, with the exception of the extreme north-west, where it is replaced by subspecies picata . Two other subspecies occur outside NSW.	Possible.	Possible	Yes
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V	Not Listed	The Black-chinned Honeyeater has two subspecies, with only the nominate (gularis) occurring in NSW. The other subspecies was formerly considered a separate species (Golden-backed Honeyeater) and is found in northern Australia between central Queensland west to the Pilbara	Unlikely, due to the lack of suitable flowering gum trees.	No	No

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				in Western Australia. The eastern subspecies extends south from central Queensland, through NSW, Victoria into south eastern South Australia, though it is very rare in the last state. In NSW it is widespread, with records from the tablelands and western slopes of the Great Dividing Range to the north-west and central-west plains and the Riverina. It is rarely recorded east of the Great Dividing Range, although regularly observed from the Richmond and Clarence River areas. It has also been recorded at a few scattered sites in the Hunter, Central Coast and Illawarra regions, though it is very rare in the latter.			
Monarcha melanopsis	Black-faced Monarch	Not Listed	Listed	The Black-faced Monarch is widespread in eastern Australia. The Black-faced Monarch mainly occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and (occasionally) cool temperate rainforest	Possible.	Possible	Yes
Monarcha trivirgatus	Spectacled Monarch	Not Listed	Listed	The Spectacled Monarch is found in coastal north-eastern and eastern Australia, including coastal islands, from Cape York, Queensland to Port Stephens, New South Wales. It is much less common in the south. It is also found in Papua New Guinea, the Moluccas and Timor. The Spectacled Monarch prefers thick understorey in rainforests, wet gullies and waterside vegetation, as well as mangroves.	Possible.	Possible	Yes
Myiagra cyanoleuca	Satin Flycatcher	Not Listed	Listed	The Satin Flycatcher is widespread in eastern Australia and vagrant to New Zealand. In NSW, they are widespread on and east of the Great Divide and sparsely scattered on the western slopes, with very occasional records on the western plains	Possible.	Possible	Yes
Neophema chrysostoma	Blue Winged Parrot	V	V	The blue-winged parrot is found across southeastern Australia. Breeding takes place from September to January, with one to two broods attempted each season. Blue-winged parrots use hollows of live and dead trees, generally eucalypts.	No suitable habitat or hollow bearing trees stuiable for breeding in the subject site.	No	No

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Neophema pulchella	Turquoise Parrot	V	Not Listed	The Turquoise Parrot's range extends from southern Queensland through to northern Victoria, from the coastal plains to the western slopes of the Great Dividing Range.	No suitable habitat or hollow bearing trees stuiable for breeding in the subject site.	No	No
Ninox connivens	Barking Owl	V	Not Listed	The Barking Owl is found throughout continental Australia except for the central arid regions. Although still common in parts of northern Australia, the species has declined greatly in southern Australia and now occurs in a wide but sparse distribution in NSW. Core populations exist on the western slopes and plains and in some northeast coastal and escarpment forests. Many populations crashed as woodland on fertile soils was cleared over the past century, leaving linear riparian strips of remnant trees as the last inhabitable areas. Surveys in 2001 demonstrated that the Pilliga Forest supported the largest population in southern Australia. The owls sometimes extend their home range into urban areas, hunting birds in garden trees and insects attracted to streetlights. Extensive wildfires in 2019-20 reduced habitat quality further, burnt many old, hollow-bearing trees needed as refuge by prey species and reduced the viability of some regional owl populations.	Possible. This species has been recorded in or nearby the subject site. However, disturbance to the subject site and lack of preferred habitat and hollow bearing trees likely precludes its presence.	Possible	Yes
Ninox strenua	Powerful Owl	V	Not Listed	The Powerful Owl is endemic to eastern and south-eastern Australia, mainly on the coastal side of the Great Dividing Range from Mackay to south-western Victoria. In NSW, it is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered records on the western slopes and plains suggesting occupancy prior to land clearing. Now at low densities throughout most of its eastern range, rare along the Murray River and former inland populations may never recover. Recent increases in population density across Sydney and some other semi-urban areas do not seem to be solely due to increased awareness of this flagship species.	Possible. This species has been recorded in or nearby the subject site. However, disturbance to the subject site and lack of preferred habitat likely precludes its presence.	Possible	Yes
Numenius madagascariensis	Eastern curlew	Not Listed	CE	Within Australia, the Eastern Curlew has a primarily coastal distribution. The species is found in all states, particularly the north, east, and south-east regions including Tasmania. Eastern Curlews are rarely recorded	Unlikely. This species has been recorded in or nearby the subject site. However,	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
				inland. In NSW the species occurs across the entire coast but is mainly found in estuaries such as the Hunter River, Port Stephens, Clarence River, Richmond River and ICOLLs of the south coast. The Eastern Curlew breeds in Russia and north-eastern China but its distribution is poorly known. During the non-breeding season a few birds occur in southern Korea and China, but most spend the non-breeding season in north, east and south-east Australia.	disturbance to the subject site and lack of preferred habitat likely precludes its presence.		
Oxyura australis	Blue-billed Duck	V	Not Listed	The Blue-billed Duck is endemic to south-eastern and south-western Australia. It is widespread in NSW, but most common in the southern Murray-Darling Basin area. Birds disperse during the breeding season to deep swamps up to 300 km away. It is generally only during summer or in drier years that they are seen in coastal areas.	No. Suitable habitat does not occur in the subject site.	No	No
Pachycephala inornata	Gilbert's Whistler	V	Not Listed	The Gilbert's Whistler is sparsely distributed over much of the arid and semi-arid zone of inland southern Australia, from the western slopes of NSW to the Western Australian wheatbelt. The species was probably once distributed almost continuously across the woodlands and mallee of southern NSW, but this range has been greatly reduced, chiefly by clearance of habitat. The eastern population extends from the central NSW mallee (Yathong, Nombinnie and Round Hill NRs), south and east through the Cocoparra Range to Pomingalama Reserve (near Wagga Wagga) then north through the South West Slopes east as far as Cowra and Burrendong Dam, to the Goonoo reserves (with scattered records as far north as Pilliga). The north western limits of this population are poorly known, with records from as far west as Cobar and recent records from Quanda NR, though records further west may be due to confusion with the Golden Whistler. In a number of reserves in this area there have been no recent records (last records from Pulletop NR 1982, Pomingalama Reserve 1995 and Ingalba NR 1999) and this species may be locally extinct. Occasional records are also made of this species in the Capertee Valley. The species is also recorded in River	Unlikely	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
				Red Gum forests along the Murray River valley between Mathoura and Wentworth, with the eastern populations (between Mathoura and Barham) apparently isolated from other NSW populations. West of Swan Hill, this population may interact with populations found to the north of the Murray River west of Balranald and as far north as the Scotia country (Tarawi NR and Scotia Sanctuary).			
Pachycephala olivacea	Olive Whistler	V	Not Listed	The Olive Whistler inhabits the wet forests on the ranges of the east coast. It has a disjunct distribution in NSW chiefly occupying the beech forests around Barrington Tops and the MacPherson Ranges in the north and wet forests from Illawarra south to Victoria. In the south it is found inland to the Snowy Mountains and the Brindabella Range.	Unlikely	No	No
Pachyptila turtur subantarctica	Fairy Prion	Not Listed	Listed	The fairy prion (southern) breeds on Macquarie Island and a number of other subantarctic islands outside of Australia. The other subspecies (P. t. turtur) breeds on New Zealand offshore islands in Bass Strait and the Falkland Islands. That subspecies has a population of several million pairs.	Unlikely	No	No
Pandion haliaetus cristatus / Pandion cristatus	Eastern Osprey	V	Migratory	They are common around the northern coast, especially on rocky shorelines, islands and reefs. The species is uncommon to rare or absent from closely settled parts of south-eastern Australia. There are a handful of records from inland areas. Favour coastal areas, especially the mouths of large rivers, lagoons and lakes. Feed on fish over clear, open water.	Unlikely. The osprey requires tall trees for roosting and is likely to be found closer to the coast or a large permanent body of water.	No	No
Petroica boodang	Scarlet Robin	V	Not Listed	The Scarlet Robin is found from south east Queensland to south east South Australia and also in Tasmania and south west Western Australia. In NSW, it occurs from the coast to the inland slopes. After breeding, some Scarlet Robins disperse to the lower valleys and plains of the tablelands and slopes. Some birds may appear as far west as the eastern edges of the inland plains in autumn and winter.	Possible	Possible	Yes
Petroica phoenicea	Flame Robin	V	Not Listed	The Flame Robin is endemic to south eastern Australia, and ranges from near the Queensland border to south east South Australia and also in Tasmania. In NSW, it	Unlikely	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
				breeds in upland areas and in winter, many birds move to the inland slopes and plains. It is likely that there are two separate populations in NSW, one in the Northern Tablelands, and another ranging from the Central to Southern Tablelands.			
Pezoporus wallicus wallicus	Eastern Ground Parrot	V	Not Listed	There are three recognised subspecies of the Ground Parrot in Australia, though the subspecies in Tasmania (leachii) is not always recognised. Recently, the possibility that the western subspecies (flaviventris) may be a separate species has been raised. The eastern subspecies (wallicus) inhabits south-eastern Australia from southern Queensland through NSW to western Victoria. It formerly occurred in South Australia, but was last recorded in 1945. In NSW populations have declined and contracted to islands of coastal or subcoastal heathland and sedgeland habitats. The species is found in relatively large numbers on the north coast (Broadwater, Bundjalung, Yuraygir and Limeburners Creek NPs) and in smaller numbers at Myall Lakes on the central coast. There are also large populations on the NSW south coast, particularly Barren Grounds NR, Budderoo NP, the Jervis Bay area and Nadgee NR. Small numbers are recorded at Morton and Ben Boyd NP and other areas on the south coast. Estimated population size is about 2000 birds.	Unlikely	No	No
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	V	Not Listed	The Grey-crowned Babbler has two distinctive subspecies that intergrade to the south of the Gulf of Carpentaria. West of here the subspecies rubeculus , formerly considered a separate species (Red-breasted Babbler) is still widespread and common. The eastern subspecies (temporalis) occurs from Cape York south through Queensland, NSW and Victoria and formerly to the south east of South Australia. This subspecies also occurs in the Trans-Fly Region in southern New Guinea. In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains reaching as far as Louth and Balranald. It also occurs in woodlands in the Hunter Valley and in several	Unlikely	No	Yes

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
				locations on the north coast of NSW. It may be extinct in the southern, central and New England tablelands.			
Pterodroma solandri	Providence Petrel	V	Not Listed	Ranges across eastern Pacific. Only known breeding sites are at Lord Howe Island and Philip Island, offshore from Norfolk Island. Previously also bred on main Norfolk Island but extinct there by 1800.	Unlikely	No	No
Ptilinopus magnificus	Wompoo Fruit-Dove	V	Not Listed	Occurs along the coast and coastal ranges from the Hunter River in NSW to Cape York Peninsula. It is rare south of Coffs Harbour. Three subspecies are recognised, with the most southerly in NSW and south-eastern Queensland. It used to occur in the Illawarra, though there are no recent records.	Possible	Possible	Yes
Ptilinopus regina	Rose-crowned Fruit-Dove	V	Not Listed	Coast and ranges of eastern NSW and Queensland, from Newcastle to Cape York. Vagrants are occasionally found further south to Victoria.	Unlikely	No	No
Ptilinopus superbus	Superb Fruit-Dove	V	Not Listed	The Superb Fruit-dove occurs principally from north-eastern in Queensland to north-eastern NSW. It is much less common further south, where it is largely confined to pockets of suitable habitat as far south as Moruya. There are records of vagrants as far south as eastern Victoria and Tasmania.	Possible	Possible	Yes
Rhipidura rufifrons	Rufous Fantail	Not Listed	Listed	The Rufous Fantail occurs in coastal and near coastal districts of northern and eastern Australia. n east and south-east Australia, the Rufous Fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by eucalypts such as Tallow-wood (Eucalyptus microcorys), Mountain Grey Gum (E. cypellocarpa), Narrow-leaved Peppermint (E. radiata), Mountain Ash (E. regnans), Alpine Ash (E. delegatensis), Blackbutt (E. pilularis) or Red Mahogany (E. resinifera); usually with a dense shrubby understorey often including ferns.	No. No suitable breeding habitat and unsuitable foraging habitat.	No	No
Rostratula australis	Australian Painted Snipe	E	E	The Australian Painted Snipe is restricted to Australia. Most records are from the south east, particularly the Murray Darling Basin, with scattered records across northern Australia and historical records from around the Perth region in Western Australia. In NSW many records are from the Murray-Darling Basin including the Paroo wetlands, Lake Cowal, Macquarie Marshes, Fivebough Swamp and more recently, swamps near Balldale and	No. No suitable breeding habitat and unsuitable foraging habitat.	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
				Wanganella. Other important locations with recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys.			
Stagonopleura guttata	Diamond Firetail	V	Not Listed	The Diamond Firetail is endemic to south-eastern Australia, extending from central Queensland to the Eyre Peninsula in South Australia. It is widely distributed in NSW, with a concentration of records from the Northern, Central and Southern Tablelands, the Northern, Cental and South Western Slopes and the North West Plains and Riverina. Not commonly found in coastal districts, though there are records from near Sydney, the Hunter Valley and the Bega Valley. This species has a scattered distribution over the rest of NSW, though is very rare west of the Darling River.	Possible	Possible	Yes
Sterna striata	White-fronted Tern	Not Listed	Listed	The White-fronted Tern occurs in coastal seas and exposed rocky costs. They can be found also on sandy beaches of sheltered coasts such as bays, harbours, estuaries and lagoons (this is less frequent in Australia than New Zealand).	No. No suitable breeding habitat and unsuitable foraging habitat.	No	No
Sternula albifrons	Little Tern	E	Not Listed	Migrating from eastern Asia, the Little Tern is found on the north, east and south-east Australian coasts, from Shark Bay in Western Australia to the Gulf of St Vincent in South Australia. In NSW, it arrives from September to November, occurring mainly north of Sydney, with smaller numbers found south to Victoria. It breeds in spring and summer along the entire east coast from Tasmania to northern Queensland, and is seen until May, with only occasional birds seen in winter months.	No	No	No
Sternula nereis nereis	Australian Fairy Tern	Not Listed	V	Within Australia, the Fairy Tern occurs along the coasts of Victoria, Tasmania, South Australia and Western Australia; occurring as far north as the Dampier Archipelago near Karratha. The subspecies has been known from New South Wales (NSW) in the past, but it is unknown if it persists there.	No	No	No
Stictonetta naevosa	Freckled Duck	V	Not Listed	The Freckled Duck is found primarily in south-eastern and south-western Australia, occurring as a vagrant elsewhere. It breeds in large temporary swamps created by floods in the Bulloo and Lake Eyre basins and the Murray-Darling system, particularly along the Paroo and	No. No suitable breeding habitat and unsuitable foraging habitat.	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
				Lachlan Rivers, and other rivers within the Riverina. The duck is forced to disperse during extensive inland droughts when wetlands in the Murray River basin provide important habitat. The species may also occur as far as coastal NSW and Victoria during such times.			
Tringa nebularia	Common Greenshank	Not Listed	Listed	The species has been recorded in most coastal regions. It is widespread west of the Great Dividing Range, especially between the Lachlan and Murray Rivers and the Darling River drainage basin, including the Macquarie Marshes, and north-west regions (Higgins & Davies 1996). The Common Greenshank is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms.	No. No suitable breeding habitat and unsuitable foraging habitat.	No	No
Turnix maculosus	Red-backed Button-quail	V	Not Listed	The Red-backed Button-quail is recorded only infrequently in NSW, with most records from the North Coast Bioregion; there are historical records south as far as Sydney and three outlying records from western NSW (a breeding record from Finley in 1954; the Macquarie Marshes in 1955; and Coolabah in 2000). The population around Sydney was last recorded in 1912. Between 1980 and 1995 the average reporting rate for this species in NSW was 2 birds per year; from 1996 to 2005, there were only six additional observations in NSW (0.75 records per year). There have been few recent records of this species within reserves: between 1977 and 1994, there were 17 records of the species from four north coast reserves in NSW: Bundjalung, Crowdy Bay, Nymboida and Yuraygir National Parks. There have been no further records within reserves in NSW since August 1994.	Potential to occur. No suitable breeding habitat, potential foraging habitat.	Potential	Yes
Tyto longimembris	Eastern Grass Owl	V	Not Listed	Eastern Grass Owls have been recorded occasionally in all mainland states of Australia but are most common in northern and north-eastern Australia. In NSW they are more likely to be resident in the north-east. Eastern Grass Owl numbers can fluctuate greatly, increasing especially during rodent plagues.	Potential to occur.	Potential	Yes

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Tyto novaehollandiae	Masked Owl	V	Not Listed	Extends from the coast where it is most abundant to the western plains. Overall records for this species fall within approximately 90% of NSW, excluding the most arid north-western corner. There is no seasonal variation in its distribution.	Potential to occur. No suitable breeding habitat, potential foraging habitat.	No	No
Tyto tenebricosa	Sooty Owl	V	Not Listed	Occupies the easternmost one-eighth of NSW, occurring on the coast, coastal escarpment and eastern tablelands. Territories are occupied permanently.	No. No suitable breeding habitat and unsuitable foraging habitat.	No	No
Xenus cinereus	Terek Sandpiper	V	Not Listed	A rare migrant to the eastern and southern Australian coasts, being most common in northern Australia, and extending its distribution south to the NSW coast in the east. The two main sites for the species in NSW are the Richmond River estuary and the Hunter River estuary. The latter has been identified as nationally and internationally important for the species.	No. No suitable breeding habitat and unsuitable foraging habitat.	No	No
Apus pacificus	Fork-tailed Swift	Not Listed	Listed	The Fork-tailed Swift is a non-breeding visitor to all states and territories of Australia (Higgins 1999). The Fork-tailed Swift is almost exclusively aerial, flying from less then 1 m to at least 300 m above ground and probably much higher.	Possible to occur flying overhead.	No	No
Cuculus opatus	Oriental Cuckoo	Not Listed	Listed	It mainly occurs in forests, occurring in coniferous, deciduous and mixed forest. Non-breeding immigrant to Australia	Possible.	No	No
Merops ornatus	Rainbow Bee-eater	Not Listed	Listed	The Rainbow Bee-eater is distributed across much of mainland Australia, and occurs on several near-shore islands. The Rainbow Bee-eater occurs mainly in open forests and woodlands, shrublands, and in various cleared or semi-cleared habitats, including farmland and areas of human habitation (Higgins 1999). It usually occurs in open, cleared or lightly-timbered areas that are often, but not always, located in close proximity to permanent water	Possible. It may occur in the subject site.	No	No
Invertebrates							
Argynnis hyperbius / Argynnis	Laced Fritillary / Australian Fritilary	E	CE	The Australian Fritillary is restricted to south-east Queensland and north-east NSW in open swampy coastal areas where the larval food plant Arrowhead Violet (Viola betonicifolia) occurs. Most recently known	Unlikely. Food plant was not recorded.	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
hyperbius inconstans				from a few widespread localities between Port Macquarie and Gympie, populations have declined dramatically to the extent that the butterfly has not been verified at any site for over a decade.			
Ocybadistes knightorum	Black Grass-dart Butterfly	E	Not Listed	The Black Grass-dart Butterfly occurs only on the NSW mid north coast from Coffs Harbour to Scotts Head. It is currently known from two disjunct areas: a northern population centred around Sawtell and a southern population along Warrell Creek. The butterfly is restricted to areas supporting its larval food plant Floyd's Grass (Alexfloydia repens,) which is also listed as an Endangered species in NSW. Habitat is located on floodplain alluvial deposits between 1m and 2m above the mean tide level, although there are two atypical headland occurrences (at Coffs Harbour and Sawtell).	Unlikely. Floyd's grass was not recorded.	No	No
Petalura gigantea	Giant Dragonfly	E	Not Listed	The Giant Dragonfly is found along the east coast of NSW from the Victorian border to northern NSW. It is not found west of the Great Dividing Range. There are known occurrences in the Blue Mountains and Southern Highlands, in the Clarence River catchment, and on a few coastal swamps from north of Coffs Harbour to Nadgee in the south.	Possible. Previously recorded on or near the subject site. Habitat not suitable for this species on subject site.	No	No
Marine Mammals							
Arctocephalus forsteri	New Zealand Fur-seal	V	Not Listed	Occurs in Australia and New Zealand. Reports of non-breeding animals along southern NSW coast particularly on Montague Island, but also at other isolated locations to north of Sydney.	No. Suitable marine habitat does not exist on the subject site	No	No
Arctocephalus pusillus doriferus	Australian Fur-seal	V	Not Listed	Reported to have bred at Seal Rocks, near Port Stephens and Montague Island in southern NSW. Haul outs are observed at isolated places along the NSW coast.	No. Suitable marine habitat does not exist on the subject site	No	No
Dugong dugon	Dugong	E	Not Listed	Extends south from warmer coastal and island waters of the Indo-West Pacific to northern NSW, where its known from incidental records only.	No. Suitable marine habitat does not exist on the subject site	No	No
Physeter macrocephalus	Sperm Whale	V	Not Listed	Wide, but patchy distribution from the tropics to the edge of the polar pack-ice in both hemispheres.	No. Suitable marine habitat does not exist on the subject site	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
Marsupials							
Aepyprymnus rufescens	Rufous Bettong	V	Not Listed	The original range from Coen in north Queensland to central Victoria has been reduced to a patchy distribution from Cooktown, Queensland, to north-eastern NSW as far south as Mt Royal National Park. In NSW it has largely vanished from inland areas but there are sporadic, unconfirmed records from the Pilliga and Torrington districts.	Likely. Previously recorded on or near the subject site.	Possible	Yes
Cercartetus nanus	Eastern Pygmy-possum	V	Not Listed	The Eastern Pygmy-possum is found in south-eastern Australia, from southern Queensland to eastern South Australia and in Tasmania. In NSW it extends from the coast inland as far as the Pilliga, Dubbo, Parkes and Wagga Wagga on the western slopes.	Likely. Previously recorded on or near the subject site.	Possible	Yes
Dasyurus maculatus	Spotted-tailed Quoll	V	E	The range of the Spotted-tailed Quoll has contracted considerably since European settlement. It is now found in eastern NSW, eastern Victoria, south-east and north-eastern Queensland, and Tasmania. Only in Tasmania is it still considered relatively common.	Likely. Previously recorded on or near the subject site.	Possible	Yes
Notamacropus parma	Parma Wallaby	V	V	The species once occurred in north-eastern NSW from the Queensland boarder to the Bega area in the southeast. Their range is now confined to the coast and ranges of central and northern NSW from the Gosford district to south of the Bruxner Highway between Tenterfield and Casino.	Unlikely.	No	No
Petauroides volans	Southern Greater Glider	E	E	The Southern Greater Glider occurs in eastern Australia, in eucalypt forests and woodlands, where it has a broad distribution from around Proserpine in Queensland, south through NSW and the Australian Capital Territory into Victoria.	Unlikely. Previously recorded on or near the subject site. Disturbance and lack of suitable habitat on the subject site probably preclude its presence. Likely to occur in connected forested areas.	No	No
Petaurus australis	Yellow-bellied Glider	V	V	The Yellow-bellied Glider is found along the eastern coast to the western slopes of the Great Dividing Range, from southern Queensland to Victoria.	Unlikely. Previously recorded on or near the subject site. Disturbance and lack	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
					of suitable habitat on the subject site probably preclude its presence. Likely to occur in connected forested areas.		
Petaurus norfolcensis	Squirrel Glider	V	Not Listed	The species is widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria.	Unlikely. Previously recorded on or near the subject site. Disturbance and lack of suitable habitat on the subject site probably preclude its presence. Likely to occur in connected forested areas.	No	No
Petrogale penicillata	Brush-tailed Rock-wallaby	E	V	The range of the Brush-tailed Rock-wallaby extends from south-east Queensland to the Grampians in western Victoria, roughly following the line of the Great Dividing Range. However, the distribution of the species across its original range has declined significantly in the west and south and has become more fragmented. In NSW they occur from the Queensland border in the north to the Shoalhaven in the south, with the population in the Warrumbungle Ranges being the western limit.	Unlikely.	No	No
Phascogale tapoatafa	Brush-tailed Phascogale	V	Not Listed	The Brush-tailed Phascogale has a patchy distribution around the coast of Australia. In NSW it is mainly found east of the Great Dividing Range although there are occasional records west of the divide.	Unlikely.	No	No
Phascolarctos cinereus	Koala	E	E	The Koala has a fragmented distribution throughout eastern Australia from north-east Queensland to the Eyre Peninsula in South Australia. In New South Wales, koala populations are found on the central and north coasts, southern highlands, southern and northern tablelands, Blue Mountains, southern coastal forests, with some smaller populations on the plains west of the Great Dividing Range.	Likely. Previously recorded on or near the subject site.	Possible	Yes

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
Planigale maculata	Common Planigale	V	Not Listed	Coastal north-eastern NSW, coastal east Queensland and Arnhem Land. The species reaches its confirmed southern distribution limit on the NSW lower north coast however there are reports of its occurrence as far south as the central NSW coast west of Sydney.	Likely. Previously recorded on or near the subject site.	Possible	Yes
Potorous tridactylus	Long-nosed Potoroo	V	V	The long-nosed potoroo is found on the south-eastern coast of Australia, from Queensland to eastern Victoria and Tasmania, including some of the Bass Strait islands. There are geographically isolated populations in western Victoria. In NSW it is generally restricted to coastal heaths and forests east of the Great Dividing Range, with an annual rainfall exceeding 760 mm.	Unlikely.	No	No
Thylogale stigmatica	Red-legged Pademelon	V	Not Listed	Patchily distributed along coastal and subcoastal eastern Australia from Cape York to the Hunter Valley in NSW. Southern range records are from the Watagan Mountains and the Wyong district. There are unconfirmed records from the western New England Tablelands (e.g. west of Emmaville). This species is also found in New Guinea.	Unlikely. Species occurs in rainforest.	No	No
Caretta caretta	Loggerhead Turtle	E	E	Loggerhead Turtles are found in tropical and temperate waters off the Australian coast. In NSW they are seen as far south as Jervis Bay and have been recorded nesting on the NSW north coast and feeding around Sydney.	No	No	No
Chelonia mydas	Green Turtle	V	V	Widely distributed in tropical and sub-tropical seas. Usually found in tropical waters around Australia but also occurs in coastal waters of NSW, where it is generally seen on the north or central coast, with occasional records from the south coast.	No	No	No
Coeranoscincus reticulatus	Three-toed Snake-tooth Skink	V	V	The Three-toed Snake-tooth Skink occurs on the coast and ranges from the Macleay valley in NSW to south-eastern Queensland. It is very uncommon south of Grafton.	Unlikely.	No	No
Dermochelys coriacea	Leatherback Turtle	E	E	Throughout the world's tropical and temperate seas and in all coastal waters of Australia. Most sightings are in temperate waters. Large numbers of Leatherback Turtles feed in coastal waters from southern Queensland to the central coast of NSW.	No. Habitat does not occur.	No	No
Hoplocephalus bitorquatus	Pale-headed Snake	V	Not Listed	A patchy distribution from north-east Queensland to the north-eastern quarter of NSW. In NSW it has historically been recorded from as far west as Mungindi and	Possible – known to occur in similar habitat	Possible	Yes

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
				Quambone on the Darling Riverine Plains, across the north west slopes, and from the north coast from Queensland to Sydney. A small number of historical records are known for the New England Tablelands from Glenn Innes and Tenterfield; however, the majority of records appear to be from sites of relatively lower elevation. Although the Pale-headed snake distribution is very cryptic, it now appears to have contracted to a patchy and fragmented distribution.			
Hoplocephalus bungaroides	Broad-headed Snake	E	V	The Broad-headed Snake is largely confined to Triassic and Permian sandstones, including the Hawkesbury, Narrabeen and Shoalhaven groups, within the coast and ranges in an area within approximately 250 km of Sydney.	Unlikely.	No	No
Hoplocephalus stephensii	Stephens' Banded Snake	V	Not Listed	Coast and ranges from Southern Queensland to Gosford in NSW.	Unlikely.	No	No
Myuchelys purvisi	Manning River Helmeted Turtle, Purvis' Turtle	E	Not Listed	Endemic to the middle and upper reaches of the Manning River catchment area. It has been recorded from the Barnard, Barrington, Cooplacurripa, Gloucester, Manning, Mummel, Nowendoc and Rowley Rivers as well as Bobin, Caparra, Dingo and Myall creeks.	No	No	No
Rodents							
Pseudomys novae hollandae	New Holland Mouse	Not Listed	Listed	Known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes. It is a social animal, living predominantly in burrows shared with other individuals	Unlikely	No	No
Pseudomys gracilicaudatus	Eastern Chestnut Mouse	V	Not Listed	In NSW the Eastern Chestnut Mouse mainly occurs north from the Hawkesbury River area as scattered records along to coast and eastern fall of the Great Dividing Range extending north into Queensland. There are however isolated records in the Jervis bay area.	Likely to occur in the subject site. Previously recorded nearby.	Possible	Yes
Pseudomys oralis	Hastings River Mouse	E	E	A patchy distribution spanning the Great Dividing Range from the Hunter Valley, south of Mt Royal, north to the Bunya Mountains near Kingaroy in south-east Queensland, at elevations between 300 m and 1100 m.	Unlikely	No	No
Plants							

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
Acacia courtii	North Brother Wattle	V	V	The North Brother Wattle is found only in the Laurieton district on the north coast of NSW, occurring on North Brother, Middle Brother and South Brother Mountains.	No. Not recorded.	No	No
Acronychia littoralis	Scented Acronychia	E	E	Scented Acronychia is found between Fraser Island in Queensland and Port Macquarie on the north coast of NSW.	No. Not recorded.	No	No
Alexfloydia repens	Floyd's Grass	E	Not Listed	Floyd's Grass occurs only on the NSW mid north coast from Coffs Harbour to Scotts Head. It is currently known from two disjunct areas: a northern population centred around Sawtell and a southern population along Warrell Creek. Most Floyd's Grass is found on floodplain alluvial deposits between 1m and 2m above the mean tide level, although there are two atypical headland occurences (at Coffs Harbour and Sawtell).	No. Not recorded.	No	No
Allocasuarina defungens	Dwarf Heath Casuarina	E	E	Dwarf Heath Casuarina is found only in NSW from the Nabiac area, north-west of Forster, and at Crowdy Bay.	No. Not recorded.	No	No
Allocasuarina simulans	Nabiac Casuarina	V	V	The Nabiac Casuarina is restricted to the mid-north coast of NSW, from Nabiac to Forster and is very rare.	No. Not recorded.	No	No
Allocasuarina thalassoscopica		Not Listed	E	In clay heaths north of Forster	No. Not recorded.	No	No
Arthraxon hispidus	Hairy Jointgrass	V	V	Occurs over a wide area in south-east Queensland, and on the northern tablelands and north coast of NSW, but is never common. Also found from Japan to central Eurasia.	No. Not recorded.	No	No
Arthropteris palisotii	Lesser Creeping Fern	E	Not Listed	Located on the Illawarra Escarpment, North-eastern NSW and also in Queensland.	No. Not recorded.	No	No
Asperula asthenes	Trailing Woodruff	V	V	This small herb occurs only in NSW. It is found in scattered locations from the Central Coast (Mandalong area) north to near Kempsey, with several records from the Port Stephens / Karuah / Wallis Lakes area / Forster (including Myall Lakes NP, New England NP, Wallingat NP and Darawnk NR).	No. Not recorded.	No	No
Banksia conferta		CE	Not Listed	In NSW, Banksia conferta subsp. conferta has a highly restricted geographic distribution. It is currently known only from a number of populations occupying about 23 ha in a small area of Coorabakh National Park, north west of Lansdowne on the Mid North Coast. Banksia conferta subsp.conferta is also known from the Lamington Plateau and the Glass House Mountains in Queensland, more than 400 km to the north.	No. Not recorded	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
Caesalpinia bonduc	Knicker Nut	E	Not Listed	Knicker Nut is only found in the northern part of Lord Howe Island, in the vicinity of Ned's Beach and near Old Settlement Beach. There are recent confirmed records of Knicker from Port Macquarie, South West Rocks and Yuraygir NP on the New South Wales North Coast. The species is distributed widely in the tropics and subtropics.	Unlikely. Not recorded on the subject site.	No	No
Caesia parviflora var. minor	Small Pale Grass-lily	E	Not Listed	This variety occurs in Tasmania, southern Victoria and south-east South Australia. The taxon is common in the Gibraltar Range, Newnes Plateau and also occurs on the south and north coast in wet heaths. This variety is of uncertain taxonomic distinctiveness, is easy overlooked, and hard to differentiate from other varieties of C. parviflora.	Unlikely. Not recorded on the subject site.	No	No
Callistemon linearifolius	Netted Bottle Brush	V	Not Listed	Recorded from the Georges River to Hawkesbury River in the Sydney area, and north to the Nelson Bay area of NSW. Recorded in 2000 at Coalcliff in the northern Illawarra. For the Sydney area, recent records are limited to the Hornsby Plateau area near the Hawkesbury River. The species was more widespread in the past, and there are currently only 5-6 populations remaining from the 22 populations historically recorded in the Sydney area. Three of the remaining populations are reserved in Ku-ring-gai Chase National Park, Lion Island Nature Reserve and Spectacle Island Nature Reserve. The species has also been recorded from Yengo National Park.	Unlikely. Not recorded on the subject site.	No	No
Chamaesyce psammogeton	Sand Spurge	E	Not Listed	Sand Spurge is found sparsely along the coast from south of Jervis Bay (at Currarong, Culburra and Seven Mile Beach National Park) to Queensland (and Lord Howe Island). Populations have been recorded in Wamberal Lagoon Nature Reserve, Myall Lakes National Park, Moonee Beach Nature Reserve and Bundjalung National Park.	Unlikely. Not recorded on the subject site.	No	No
Cryptostylis hunteriana	Leafless Tongue Orchid	V	V	The Leafless Tongue Orchid has been recorded from as far north as Gibraltar Range National Park south into Victoria around the coast as far as Orbost. It is known historically from a number of localities on the NSW south coast and has been observed in recent years at many sites between Batemans Bay and Nowra (although it is uncommon at all sites). Also recorded at Munmorah	Possible. Not recorded	Possible	Yes

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
				State Conservation Area, Nelson Bay, Wyee, Washpool National Park, Nowendoc State Forest, Ku-Ring-Gai Chase National Park and Ben Boyd National Park.			
Cynanchum elegans	White-flowered Wax Plant	E	E	Restricted to eastern NSW where it is distributed from Brunswick Heads on the north coast to Gerroa in the Illawarra region. The species has been recorded as far west as Merriwa in the upper Hunter River valley.	Unlikely. Not recorded on the subject site.	No	No
Dendrobium melaleucaphilum	Spider orchid	E	Not Listed	Occurs in coastal districts and nearby ranges, extending from Queensland to its southern distributional limit in the lower Blue Mountains. In NSW, it is currently known from seven recent collections. There has been no subsequent confirmation from the locations of three earlier (pre-1922) collections and it is possible that these are now extinct.	Possible. Not recorded	Possible	Yes
Diuris byronensis	Byron Bay Diuris	E	Not Listed	This orchid is known from a single location only, at Byron Bay in north-east NSW. Only about 20 plants have been recorded.	Possible. Not recorded	Possible	Yes
Diuris disposita	Willawarrin Doubletail	E	Not Listed	Known only from Rollands Plains, Willawarin, Collombatti, Yarravel NR.	Possible. Not recorded	Possible	Yes
Eucalyptus largeana	Craven Grey Box	E	E	Confined to Gloucester-Craven district and near Pokolbin, although a number of unsubstantiated records exist from outside the currently accepted range. Fourteen populations are believed to be extant and ten populations which have not been sighted in more than 50 years are presumed extinct. A further 18 populations remain unconfirmed, including nine populations reported from outside the currently accepted range. Populations are known from Copeland Tops State Conservation Area and Berrico Nature Reserve, with unconfirmed records from Talawahl and Glen Nature Reserves and Willi Willi National Park. The majority of remaining populations occur on private lands and roadsides, often as single trees or small clumps interspersed with other tree species.	Unlikely. Not recorded on the subject site.	No	No
Eucalyptus nicholii	Narrow-leaved Black Peppermint	V	V	This species is sparsely distributed but widespread on the New England Tablelands from Nundle to north of Tenterfield, being most common in central portions of its range. Found largely on private property and roadsides, and occasionally in conservation reserves. Planted as urban trees, windbreaks and corridors.	Unlikely. Not recorded on the subject site.	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
Eucalyptus seeana	Eucalyptus seeana population in the Greater Taree local government area	EP	Not Listed	A small to medium-sized woodland red gum tree of coastal and subcoastal New South Wales from about Telegraph Point northwards into Queensland, to west of Caloundra, usually on sandy soils.	Unlikely. Not recorded on the subject site.	No	No
Euphrasia arguta		CE	CE	Euphrasia arguta was rediscovered in the Nundle area of the NSW north western slopes and tablelands in 2008. Prior to this, it had not been collected for 100 years. Historically, Euphrasia arguta has only been recorded from relatively few places within an area extending from Sydney to Bathurst and north to Walcha. The Royal Botanic Gardens Specimen Register records an additional location reported and vouchered in 2002 from near the Hastings River; and Euphrasia arguta was also recorded from the Barrington Tops in 2012.	Unlikely. Not recorded on the subject site.	No	No
Galium australe	Tangled Bedstraw	E	Not Listed	Tangled Bedstraw is widespread in Victoria and Tasmania and is also found in South Australia (and ACT Territory in Jervis Bay). Following a taxonomic revision, many recent records in NSW have been re-determined as other species. Tangled Bedstraw has been recorded historically in the Nowra (Colymea) and Narooma areas and is extant in Nadgee Nature Reserve, south of Eden. Records in the Sydney area are yet to be confirmed.	Unlikely. Not recorded on the subject site.	No	No
Glycine clandestina (broad leaf form)	Glycine clandestina (broad leaf form) in the Nambucca Local Government Area	EP	Not Listed	Only known from two locations about 200m apart on narrow shelf of a headland immediately south of Scotts Head.	Unlikely. Not recorded on the subject site.	No	No
Grammitis stenophylla	Narrow-leaf Finger Fern	E	Not Listed	Grammitis stenophylla is known from thirty (30) locations across New South Wales. The species is known to occur in twenty four (24) conservations reserves. It is common in several areas, such as the Mount Warning Shield, the sandstone reserves of the lower Clarence, the granites of Washpool, Gibraltar and Nymbioda National Parks, and also Mt Jerusalem and Nightcap National Park. The species was also recently recorded from New England National Park.	Unlikely. Not recorded on the subject site.	No	No
Grevillea caleyi	Caley's Grevillea	CE	CE	Restricted to an 8 km square area around Terrey Hills, approximately 20 km north of Sydney. Occurs in three major areas of suitable habitat, namely Belrose, Ingleside	Unlikely. Not recorded on the subject site.	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
				and Terrey Hills/Duffys Forest within the Ku-ring-gai, Pittwater and Warringah Local Government Areas.			
Grevillea guthrieana	Guthrie's Grevillea	E	E	Known from the north coast of NSW, at Booral near Bulahdelah and on the Carrai Plateau, south-west of Kempsey.	Unlikely. Not recorded on the subject site.	No	No
Hakea archaeoides	Big Nellie Hakea	V	V	Found only in NSW. It is restricted to the hinterland between Kempsey and Taree, around Mt Boss, Broken Bago and Lansdowne. The closely related Hakea trineura occurs only in Queensland.	Unlikely. Not recorded on the subject site.	No	No
Haloragis exalata subsp. velutina	Tall Velvet Sea-berry	V	V	This subspecies of Tall Sea-berry occurs on the north coast of NSW and southeastern Queensland. It is plentiful in inaccessible areas of the upper Macleay River.	Unlikely. Not recorded on the subject site.	No	No
Hibbertia hexandra	Tree Guinea Flower	E	Not Listed	The main occurrence of Tree Guinea Flower is in the coastal ranges of the Mount Warning area of north-east NSW including Mt Warning and Nightcap National Parks. However, there is an important separate occurrence in the Wauchope–Kendall area, which may be a new species.	Unlikely. Not recorded on the subject site.	No	No
Lindernia alsinoides	Noah's False Chickweed	E	Not Listed	Recorded in the mid-coastal areas from Bulahdelah to Coopernook, including coastal populations at Forster (e.g. Cape Hawke); and with occurrences further north at Shannon Creek west of Coutts Crossing and also at Bungawalbyn and near Casino, in the far NSW North Coast.	Unlikely. Not recorded on the subject site.	No	No
Lindsaea incisa	Slender Screw Fern	E	Not Listed	Slender Screw Fern is known from fifteen locations in New South Wales between Port Macquarie and the Queensland border. It is common in Fortis Creek National Park, Banyabba Nature Reserve and Wells Crossing Flora Reserve. Also occurs in north and south-east Queensland.	Unlikely. Not recorded on the subject site.	No	No
Macadamia integrifolia	Macadamia Nut	Not Listed	V	Not known to occur naturally in the wild in NSW.	Unlikely. Not recorded on the subject site.	No	No
Marsdenia longiloba / Leichardtia longiloba	Slender Marsdenia/ Clear Milk Vine	E	V	Scattered sites on the north coast of NSW north from Barrington Tops. Also occurs in south-east Queensland.	Unlikely. Not recorded on the subject site.	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
Maundia triglochinoides		V	Not Listed	Restricted to coastal NSW and extending into southern Queensland. The current southern limit is Wyong; former sites around Sydney are now extinct.	Unlikely. Not recorded on the subject site.	No	No
Melaleuca biconvexa	Biconvex Paperbark	V	V	Biconvex Paperbark is only found in NSW, with scattered and dispersed populations found in the Jervis Bay area in the south and the Gosford-Wyong area in the north.	Unlikely. Not recorded on the subject site.	No	No
Melaleuca groveana	Grove's Paperbark	V	Not Listed	Widespread, scattered populations in coastal districts north of Yengo National Park to southeast Queensland. Also found as a disjunct population near Torrington on the nothern tablelands.	Unlikely. Not recorded on the subject site.	No	No
Niemeyera whitei	Rusty Plum, Plum Boxwood	V	Not Listed	Rusty Plum occurs in the coast and adjacent ranges of northern NSW from the Macleay River into southern Queensland. Its distributional stronghold is on the mid north coast around Coffs Harbour.	Unlikely. Not recorded on the subject site.	No	No
Oberonia titania	Red-flowered King of the Fairies	V	Not Listed	Red-flowered King of the Fairies occurs on the NSW north coast north from Kendall, and also in in Queensland and Norfolk Island. It is known from 10 locations in NSW, two of which occur within Dorrigo National Park and Washpool National Park.	Unlikely. Not recorded on the subject site. Occurs nearby.	No	No
Parsonsia dorrigoensis	Milky Silkpod	V	E	Milky Silkpod is found only within NSW, with scattered populations in the north coast region between Kendall and Woolgoolga.	Unlikely. Not recorded on the subject site.	No	No
Peristeranthus hillii	Brown Fairy-chain Orchid	V	Not Listed	Found in north-eastern NSW, north from Port Macquarie, extending to north-eastern Queensland as far as the Bloomfield River.	Possible. Not recorded	Possible	Yes
Phaius australis	Southern Swamp Orchid	E	E	Occurs in Queensland and north-east NSW as far south as Coffs Harbour. Historically, it extended farther south, to Port Macquarie.	Possible. Not recorded	Possible	Yes
Philotheca obovatifolia		E	Not Listed	Known from only three populations in a small area in Werrikimbe National Park and Mount Boss State Forest, south-east of Walcha on the eastern edge of the New England Tablelands. Also occurs in Queensland.	Unlikely.	No	No
Pomaderris queenslandica	Scant Pomaderris	E	Not Listed	Widely scattered but not common in north-east NSW and in Queensland. It is known from several locations on the NSW north coast and a few locations on the New England Tablelands and North West Slopes, including near Torrington and Coolata.	Unlikely. Not recorded on the subject site.	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
Pultenaea maritima	Coast Headland Pea	V	Not Listed	Occurs in New South Wales and Queensland. Within NSW, the species has been recorded from Newcastle north to Byron Bay on 16 headlands. Populations vary from a few plants to larger populations of many hundreds of individuals where the species is a major component of the Kangaroo Grass Headland community. Five sites occur within conservation reserves.	Unlikely. Not recorded on the subject site.	No	No
Rhodamnia rubescens	Scrub Turpentine	CE	CE	Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland. Populations of typically occur in coastal regions and occasionally extend inland onto escarpments up to 600 m a.s.l. in areas with rainfall of 1,000-1,600 mm.	Unlikely. Not recorded on the subject site. Occurs nearby.	No	No
Rhodomyrtus psidioides	Native Guava	CE	CE	Occurs from Broken Bay, approximately 90 km north of Sydney, New South Wales, to Maryborough in Queensland. Populations are typically restricted to coastal and sub-coastal areas of low elevation however the species does occur up to c. 120 km inland in the Hunter and Clarence River catchments and along the Border Ranges in NSW.	Unlikely. Not recorded on the subject site. Occurs nearby.	No	No
Senna acclinis	Rainforest Cassia	E	Not Listed	Occurs in coastal districts and adjacent tablelands of NSW from the Illawarra in NSW to Queensland.	Unlikely. Not recorded on the subject site.	No	No
Solanum sulphureum	Manning Yellow Solanum	E	E	Restricted to the Taree – Wingham area on the mid north coast of NSW. Records indicate two locations near Mooral Creek and within Kiwarrak State Forest. Other known locations include Marlee and Killawarra in Greater Taree LGA. Also predicted to occur in Bellangry State Forest in Port Macquarie-Hastings LGA.	Unlikely. Not recorded on the subject site.	No	No
Sophora tomentosa	Silverbush	E	Not Listed	Silverbush occurs in coastal areas in Queensland and northern NSW. It was previously common north from Port Stephens but is now uncommon and found only north of Old Bar, near Taree. The largest known population, at Port Macquarie, is estimated at up to 500 plants, other populations are of less than 20 plants. It is found in a number of other countries.	Unlikely. Not recorded on the subject site.	No	No
Syzygium paniculatum	Magenta Lilly Pilly	E	V	The Magenta Lilly Pilly is found only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest.	Unlikely. Not recorded on the subject site.	No	No

Scientific name	Common name	BC Act	EPBC Act	Habitat and distribution	Likely to occur in the subject site	Likely to be impacted by the proposal	Test of significance required?
Thesium australe	Austral Toadflax	V	V	Austral Toad-flax is found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. It is also found in Tasmania and Queensland and in eastern Asia. Although originally described from material collected in the SW Sydney area, populations have not been seen in a long time. It may persist in some areas in the broader region.	Possible. Not recorded	Possible	Yes
Tinospora smilacina	Tinospora Vine	E	Not Listed	North from the Coffs Harbour district in north-east NSW, where it is rare. Its distribution also includes Queensland, Northern Territory and Western Australia.	Possible. Not recorded	Possible	Yes
Tylophora woollsii	Cryptic Forest Twiner	E	E	The Cryptic Forest Twiner is found from the NSW north coast and New England Tablelands to southern Queensland, but is very rare within that range. Known on the Tablelands from the Bald Rock and Boonoo Boonoo areas north of Tenterfield.	Possible. Not recorded	Possible	Yes
Zieria lasiocaulis	Willi Willi Zieria	E	E	Willi Willi Zieria is restricted to the headwaters of the Wilson River in Willi Willi National Park south-west of Kempsey in NSW.	Unlikely. Not recorded on the subject site.	No	No
Perisicaria elatior	Tall Knotweed	Not Listed	Listed	Tall Knotweed has been recorded in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and Picton Lakes. In northern NSW it is known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). The species also occurs in Queensland. This species normally grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	Unlikely. Not recorded on the subject site.	No	No

3.3 Aquatic ecological communities

There are no FM Act listed aquatic ecological communities in the subject site. There are limited aquatic values present within the subject site, as waterways are ephemeral.

Partridge Creek lies approximately 50m west of the subject site and is listed under the *Fisheries Management Act 1994* as Key Fish Habitat. The existing topography of the subject site drains surface water directly into the Partridge Creek catchment.

Plate 3-1: Northern Melaleuca quinquenervia Swamp Forest showing evidence of plant dieback and vegetation clearing

Plate 3-2: Dieback impacted *Casuarina* species

4. Mitigation measures and recommendations

The following mitigation measures are recommended to reduce the impact on threatened fauna with potential to occur in the subject site, and reduce other environmental impact such as erosion or loss of habitat features:

- All vegetation clearing is to be limited to within the assessed areas of the proposed ZS site and proposed access road. Clearing outside the assessed areas is not permitted without further assessment.
- Minimise disturbance of the soil during vegetation removal to reduce the risk of erosion and sediment movement within the catchment area (outside the subject site).
- Appropriate erosion and sediment control measures be installed during constriction, with particular attention on the northern and western boundary of the subject area to prevent sediment exiting the site and entering Partridge Creek.
- Essential Energy has a general biosecurity duty to ensure the biosecurity risks posed by weeds and other invasive species are prevented, eliminated or minimised, and that the risk of importing additional weeds to the proposal site is appropriately managed.
- Logs from felled trees may be retained adjacent to the site or in the local area to provide future habitat value.

5. Conclusion

The proposal is unlikely to have a significant impact on any threatened species, populations or threatened ecological communities within the subject site, and is not located on land mapped as outstanding biodiversity value. The proposal therefore does not require assessment under the Biodiversity Offset Scheme, or preparation of a Species Impact Statement.

Further assessment is not required.

6. Appendix A – Database searches

NSW predicted threatened species – Macleay Hastings IBRA subregion.

Scientific Name	Common Name	NSW status	Comm. status
Amphibians			
Crinia tinnula	Wallum Froglet	Vulnerable	Not Listed
^Mixophyes balbus	Stuttering Frog	Endangered	Vulnerable
^Mixophyes iteratus	Giant Barred Frog	Endangered	Endangered
Philoria sphagnicolus	Sphagnum Frog	Vulnerable	Vulnerable
Litoria aurea	Green and Golden Bell Frog	Endangered	Vulnerable
Litoria booroolongensis	Booroolong Frog	Endangered	Endangered
Litoria brevipalmata	Green-thighed Frog	Vulnerable	Not Listed
Litoria daviesae	Davies' Tree Frog	Vulnerable	Not Listed
Caretta caretta	Loggerhead Turtle	Endangered	Endangered
Chelonia mydas	Green Turtle	Vulnerable	Vulnerable
Dermochelys coriacea	Leatherback Turtle	Endangered	Endangered
Myuchelys purvisi	Manning River Helmeted Turtle, Purvis' Turtle	Endangered	Not Listed
Reptiles			
Coeranoscincus reticulatus	Three-toed Snake-tooth Skink	Vulnerable	Vulnerable
Hoplocephalus bitorquatus	Pale-headed Snake	Vulnerable	Not Listed
^Hoplocephalus bungaroides	Broad-headed Snake	Endangered	Vulnerable
Hoplocephalus stephensii	Stephens' Banded Snake	Vulnerable	Not Listed
Birds			
Dromaius novaehollandiae	Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area	Endangered	Not Listed
Anseranas semipalmata	Magpie Goose	Vulnerable	Not Listed
Oxyura australis	Blue-billed Duck	Vulnerable	Not Listed
Stictonetta naevosa	Freckled Duck	Vulnerable	Not Listed
Ptilinopus magnificus	Wompoo Fruit-Dove	Vulnerable	Not Listed
Ptilinopus regina	Rose-crowned Fruit-Dove	Vulnerable	Not Listed
Ptilinopus superbus	Superb Fruit-Dove	Vulnerable	Not Listed
Ardenna carneipes	Flesh-footed Shearwater	Vulnerable	Not Listed
Macronectes giganteus	Southern Giant Petrel	Endangered	Endangered
Pterodroma solandri	Providence Petrel	Vulnerable	Not Listed
Ephippiorhynchus asiaticus	Black-necked Stork	Endangered	Not Listed
Botaurus poiciloptilus	Australasian Bittern	Endangered	Endangered
Ixobrychus flavicollis	Black Bittern	Vulnerable	Not Listed
Circus assimilis	Spotted Harrier	Vulnerable	Not Listed
Haliaeetus leucogaster	White-bellied Sea-Eagle	Vulnerable	Not Listed
^^Hamirostra melanosternon	Black-breasted Buzzard	Vulnerable	Not Listed
Hieraaetus morphnoides	Little Eagle	Vulnerable	Not Listed
^^Lophoictinia isura	Square-tailed Kite	Vulnerable	Not Listed
^^Pandion cristatus	Eastern Osprey	Vulnerable	Not Listed
Grus rubicunda	Brolga	Vulnerable	Not Listed
Amaurornis moluccana	Pale-vented Bush-hen	Vulnerable	Not Listed
Burhinus grallarius	Bush Stone-curlew	Endangered	Not Listed

Scientific Name	Common Name	NSW status	Comm. status
Esacus magnirostris	Beach Stone-curlew	Critically Endangered	Not Listed
Haematopus fuliginosus	Sooty Oystercatcher	Vulnerable	Not Listed
Haematopus longirostris	Pied Oystercatcher	Endangered	Not Listed
Charadrius leschenaultii	Greater Sand-plover	Vulnerable	Vulnerable
Charadrius mongolus	Lesser Sand-plover	Vulnerable	Endangered
Irediparra gallinacea	Comb-crested Jacana	Vulnerable	Not Listed
Rostratula australis	Australian Painted Snipe	Endangered	Endangered
Calidris alba	Sanderling	Vulnerable	Not Listed
Calidris ferruginea	Curlew Sandpiper	Endangered	Critically Endangered
Calidris tenuirostris	Great Knot	Vulnerable	Critically Endangered
Limicola falcinellus	Broad-billed Sandpiper	Vulnerable	Not Listed
Limosa limosa	Black-tailed Godwit	Vulnerable	Not Listed
Xenus cinereus	Terek Sandpiper	Vulnerable	Not Listed
Turnix maculosus	Red-backed Button-quail	Vulnerable	Not Listed
Sternula albifrons	Little Tern	Endangered	Not Listed
^Calyptorhynchus lathami lathami	South-eastern Glossy Black-Cockatoo	Vulnerable	Vulnerable
Glossopsitta pusilla	Little Lorikeet	Vulnerable	Not Listed
Lathamus discolor	Swift Parrot	Endangered	Critically Endangered
^^Neophema pulchella	Turquoise Parrot	Vulnerable	Not Listed
^^Pezoporus wallicus wallicus	Eastern Ground Parrot	Vulnerable	Not Listed
^^Ninox connivens	Barking Owl	Vulnerable	Not Listed
^^Ninox strenua	Powerful Owl	Vulnerable	Not Listed
^^Tyto longimembris	Eastern Grass Owl	Vulnerable	Not Listed
^^Tyto novaehollandiae	Masked Owl	Vulnerable	Not Listed
^^Tyto tenebricosa	Sooty Owl	Vulnerable	Not Listed
Atrichornis rufescens	Rufous Scrub-bird	Vulnerable	Endangered
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	Vulnerable	Not Listed
Chthonicola sagittata	Speckled Warbler	Vulnerable	Not Listed
^Anthochaera phrygia	Regent Honeyeater	Critically Endangered	Critically Endangered
Epthianura albifrons	White-fronted Chat	Vulnerable	Not Listed
Grantiella picta	Painted Honeyeater	Vulnerable	Vulnerable
Lichenostomus fasciogularis	Mangrove Honeyeater	Vulnerable	Not Listed
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	Vulnerable	Not Listed
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	Vulnerable	Not Listed
Daphoenositta chrysoptera	Varied Sittella	Vulnerable	Not Listed
Coracina lineata	Barred Cuckoo-shrike	Vulnerable	Not Listed
Pachycephala inornata	Gilbert's Whistler	Vulnerable	Not Listed
Pachycephala olivacea	Olive Whistler	Vulnerable	Not Listed
Artamus cyanopterus cyanopterus	Dusky Woodswallow	Vulnerable	Not Listed
Carterornis leucotis	White-eared Monarch	Vulnerable	Not Listed
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	Vulnerable	Not Listed
Petroica boodang	Scarlet Robin	Vulnerable	Not Listed

Scientific Name	Common Name	NSW status	Comm. status
Petroica phoenicea	Flame Robin	Vulnerable	Not Listed
Stagonopleura guttata	Diamond Firetail	Vulnerable	Not Listed
Dasyurus maculatus	Spotted-tailed Quoll	Vulnerable	Endangered
Mammals			
Phascogale tapoatafa	Brush-tailed Phascogale	Vulnerable	Not Listed
Planigale maculata	Common Planigale	Vulnerable	Not Listed
Phascolarctos cinereus	Koala	Endangered	Endangered
Cercartetus nanus	Eastern Pygmy-possum	Vulnerable	Not Listed
Petaurus australis	Yellow-bellied Glider	Vulnerable	Vulnerable
Petaurus norfolcensis	Squirrel Glider	Vulnerable	Not Listed
Petauroides volans	Southern Greater Glider	Endangered	Endangered E
Aepyprymnus rufescens	Rufous Bettong	Vulnerable	Not Listed
Potorous tridactylus	Long-nosed Potoroo	Vulnerable	Vulnerable
Notamacropus parma	Parma Wallaby	Vulnerable	Vulnerable
Petrogale penicillata	Brush-tailed Rock-wallaby	Endangered	Vulnerable
Thylogale stigmatica	Red-legged Pademelon	Vulnerable	Not Listed
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Vulnerable
Syconycteris australis	Common Blossom-bat	Vulnerable	Not Listed
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Vulnerable	Not Listed
Micronomus norfolkensis	Eastern Coastal Free-tailed Bat	Vulnerable	Not Listed
Chalinolobus nigrogriseus	Hoary Wattled Bat	Vulnerable	Not Listed
Falsistrellus tasmaniensis	Eastern False Pipistrelle	Vulnerable	Not Listed
Myotis macropus	Southern Myotis	Vulnerable	Not Listed
Nyctophilus bifax	Eastern Long-eared Bat	Vulnerable	Not Listed
Phoniscus papuensis	Golden-tipped Bat	Vulnerable	Not Listed
Scoteanax rueppellii	Greater Broad-nosed Bat	Vulnerable	Not Listed
Vespadelus troughtoni	Eastern Cave Bat	Vulnerable	Not Listed
Miniopterus australis	Little Bent-winged Bat	Vulnerable	Not Listed
Miniopterus orianae oceanensis	Large Bent-winged Bat	Vulnerable	Not Listed
Pseudomys gracilicaudatus	Eastern Chestnut Mouse	Vulnerable	Not Listed
Pseudomys oralis	Hastings River Mouse	Endangered	Endangered
Dugong dugon	Dugong	Endangered	Not Listed
Arctocephalus forsteri	New Zealand Fur-seal	Vulnerable	Not Listed
Arctocephalus pusillus doriferus	Australian Fur-seal	Vulnerable	Not Listed
Physeter macrocephalus	Sperm Whale	Vulnerable	Not Listed
Insects			
Ocybadistes knightorum	Black Grass-dart Butterfly	Endangered	Not Listed
Argynnis hyperbius	Laced Fritillary	Endangered	Critically Endangered
Petalura gigantea	Giant Dragonfly	Endangered	Not Listed
Plants			
Caesia parviflora var. minor	Small Pale Grass-lily	Endangered	Not Listed
Cynanchum elegans	White-flowered Wax Plant	Endangered	Endangered
Marsdenia longiloba	Slender Marsdenia	Endangered	Vulnerable
Parsonsia dorrigoensis	Milky Silkpod	Vulnerable	Endangered
Tylophora woollsii	Cryptic Forest Twiner	Endangered	Endangered

Scientific Name	Common Name	NSW status	Comm. status
Allocasuarina defungens	Dwarf Heath Casuarina	Endangered	Endangered
Allocasuarina simulans	Nabiac Casuarina	Vulnerable	Vulnerable
^^Arthropteris palisotii	Lesser Creeping Fern	Endangered	Not Listed
Hibbertia hexandra	Tree Guinea Flower	Endangered	Not Listed
Chamaesyce psammogeton	Sand Spurge	Endangered	Not Listed
Caesalpinia bonduc	Knicker Nut	Endangered	Not Listed
Senna acclinis	Rainforest Cassia	Endangered	Not Listed
Glycine clandestina (broad leaf form)	Glycine clandestina (broad leaf form) in the Nambucca Local Government Area	Endangered	Not Listed
Pultenaea maritima	Coast Headland Pea	Vulnerable	Not Listed
Sophora tomentosa	Silverbush	Endangered	Not Listed
Acacia courtii	North Brother Wattle	Vulnerable	Vulnerable
^^Grammitis stenophylla	Narrow-leaf Finger Fern	Endangered	Not Listed
Haloragis exalata subsp. velutina	Tall Velvet Sea-berry	Vulnerable	Vulnerable
Maundia triglochinoides		Vulnerable	Not Listed
Lindernia alsinoides	Noah's False Chickweed	Endangered	Not Listed
^^Lindsaea incisa	Slender Screw Fern	Endangered	Not Listed
Tinospora smilacina	Tinospora Vine	Endangered	Not Listed
^^Callistemon linearifolius	Netted Bottle Brush	Vulnerable	Not Listed
Eucalyptus largeana	Craven Grey Box	Endangered	Endangered
Eucalyptus nicholii	Narrow-leaved Black Peppermint	Vulnerable	Vulnerable
Eucalyptus seeana	Eucalyptus seeana population in the Greater Taree local government area	Endangered	Not Listed
Melaleuca biconvexa	Biconvex Paperbark	Vulnerable	Vulnerable
Melaleuca groveana	Grove's Paperbark	Vulnerable	Not Listed
Rhodamnia rubescens	Scrub Turpentine	Critically Endangered	Critically Endangered
Rhodomyrtus psidioides	Native Guava	Critically Endangered	Critically Endangered
Syzygium paniculatum	Magenta Lilly Pilly	Endangered	Vulnerable
^Cryptostylis hunteriana	Leafless Tongue Orchid	Vulnerable	Vulnerable
^Dendrobium melaleucaphilum	Spider orchid	Endangered	Not Listed
^Diuris byronensis	Byron Bay Diuris	Endangered	Not Listed
^Diuris disposita	Willawarrin Doubletail	Endangered	Not Listed
^Oberonia titania	Red-flowered King of the Fairies	Vulnerable	Not Listed
^Peristeranthus hillii	Brown Fairy-chain Orchid	Vulnerable	Not Listed
^Phaius australis	Southern Swamp Orchid	Endangered	Endangered
Alexfloydia repens	Floyd's Grass	Endangered	Not Listed
Arthraxon hispidus	Hairy Jointgrass	Vulnerable	Vulnerable
^Banksia conferta		Critically Endangered	Not Listed
^^Grevillea caleyi	Caley's Grevillea	Critically Endangered	Critically Endangered
Grevillea guthrieana	Guthrie's Grevillea	Endangered	Endangered
^^Hakea archaeoides	Big Nellie Hakea	Vulnerable	Vulnerable
Pomaderris queenslandica	Scant Pomaderris	Endangered	Not Listed
Asperula asthenes	Trailing Woodruff	Vulnerable	Vulnerable
Galium australe	Tangled Bedstraw	Endangered	Not Listed
Acronychia littoralis	Scented Acronychia	Endangered	Endangered
Philotheca obovatifolia		Endangered	Not Listed

Scientific Name	Common Name	NSW status	Comm. status
Zieria lasiocaulis	Willi Willi Zieria	Endangered	Endangered
Thesium australe	Austral Toadflax	Vulnerable	Vulnerable
Niemeyera whitei	Rusty Plum, Plum Boxwood	Vulnerable	Not Listed
Solanum sulphureum	Manning Yellow Solanum	Endangered	Endangered
Communities			
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		Endangered	Not Listed
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		Endangered	Not Listed
Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		Endangered	Not Listed
Lowland Rainforest in the NSW North Coast and Sydney Basin Bioregions		Endangered	Not Listed
Lowland Rainforest on Floodplain in the New South Wales North Coast Bioregion		Endangered	Not Listed
Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion		Endangered	Not Listed
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		Endangered	Not Listed
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		Endangered	Not Listed
Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions		Endangered	Not Listed

EPBC Act – Protected Matters Report

Australian Government
Department of Climate Change, Energy, the Environment and Water

EPBC Act Protected Matters Report

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

Report created: 05-Oct-2023

AREA

Summary

Matters of National Environment Significance

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

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance (Ramsar	None
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	4
Listed Threatened Species:	52
Listed Migratory Species:	18

Other Matters Protected by the EPBC Act

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

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

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

Commonwealth Lands:	1
Commonwealth Heritage Places:	None
Listed Marine Species:	26
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None
Habitat Critical to the Survival of Marine Turtles:	None

Extra Information

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

State and Territory Reserves:	1
Regional Forest Agreements:	1
Nationally Important Wetlands:	None
EPBC Act Referrals:	5
Key Ecological Features (Marine):	None
Biologically Important Areas:	None
Bioregional Assessments:	None
Geological and Bioregional Assessments:	None

Details

Matters of National Environmental Significance

Listed Threatened Ecological Communities [Resource Information]

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

Community Name	Threatened Category	Presence Text	Buffer Status
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	Endangered	Community likely to occur within area	In feature area
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community may occur within area	In buffer area only
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area	In feature area
Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions	Endangered	Community likely to occur within area	In feature area

Listed Threatened Species [Resource Information]

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

Scientific Name	Threatened Category	Presence Text	Buffer Status
BIRD			
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat known to occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calyptorhynchus lathami lathami South-eastern Glossy Black-Cockatoo [67036]	Vulnerable	Species or species habitat known to occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Climacteris picumnus victoriae Brown Treecreeper (south-eastern) [67062]	Vulnerable	Species or species habitat known to occur within area	In feature area
Erythrotriorchis radiatus Red Goshawk [942]	Endangered	Species or species habitat may occur within area	In feature area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat may occur within area	In feature area
Grantiella picta Painted Honeyeater [470]	Vulnerable	Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Limosa lapponica baueri Nunivak Bar-tailed Godwit, Western Alaskan Bar-tailed Godwit [86380]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Melanodryas cucullata cucullata South-eastern Hooded Robin, Hooded Robin (south-eastern) [67093]	Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pachyptila turtur subantarctica Fairy Prion (southern) [64445]	Vulnerable	Species or species habitat likely to occur within area	In buffer area only
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area	In feature area
Stagonopleura guttata Diamond Firetail [59398]	Vulnerable	Species or species habitat may occur within area	In feature area
Sternula nereis nereis Australian Fairy Tern [82950]	Vulnerable	Species or species habitat may occur within area	In feature area
FROG			
Litoria aurea Green and Golden Bell Frog [1870]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Mixophyes balbus Stuttering Frog, Southern Barred Frog (in Victoria) [1942]	Vulnerable	Species or species habitat may occur within area	In feature area
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Vulnerable	Species or species habitat may occur within area	In feature area
INSECT			
Argynnis hyperbius inconstans Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area	In feature area
MAMMAL			
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Dasyurus maculatus maculatus (SE mainland population)			
Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat known to occur within area	In feature area
Notamacropus parma			
Parma Wallaby [89289]	Vulnerable	Species or species habitat may occur within area	In feature area
Petauroides volans			
Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area	In feature area
Petaurus australis australis			
Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat known to occur within area	In feature area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)			
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area	In feature area
Potorous tridactylus tridactylus			
Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Pseudomys novaehollandiae			
New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat may occur within area	In feature area
Pteropus poliocephalus			
Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or related behaviour known to occur within area	In feature area
PLANT			
Acronychia littoralis			
Scented Acronychia [8582]	Endangered	Species or species habitat likely to occur within area	In feature area
Allocasuarina defungens			
Dwarf Heath Casuarina [21924]	Endangered	Species or species habitat known to occur within area	In buffer area only
Allocasuarina thalassoscopica			
[21927]	Endangered	Species or species habitat known to occur within area	In buffer area only

Scientific Name	Threatened Category	Presence Text	Buffer Status
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Asperula asthenes Trailing Woodruff [14004]	Vulnerable	Species or species habitat known to occur within area	In feature area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Cynanchum elegans White-flowered Wax Plant [12533]	Endangered	Species or species habitat likely to occur within area	In feature area
Euphrasia arguta [4325]	Critically Endangered	Species or species habitat may occur within area	In feature area
Leichhardtia longiloba listed as Marsdenia longiloba Clear Milkvine [91911]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat may occur within area	In feature area
Melaleuca biconvexa Biconvex Paperbark [5583]	Vulnerable	Species or species habitat known to occur within area	In feature area
Persicaria elatior Knotweed, Tall Knotweed [5831]	Vulnerable	Species or species habitat may occur within area	In buffer area only
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area	In feature area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat known to occur within area	In feature area
Syzygium paniculatum Magenta Lilly Pilly, Magenta Cherry, Daguba, Scrub Cherry, Creek Lilly Pilly, Brush Cherry [20307]	Vulnerable	Species or species habitat may occur within area	In feature area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Vincetoxicum woollsii listed as Tylophora woollsii [40080]	Endangered	Species or species habitat likely to occur within area	In feature area
REPTILE			
Coeranoscincus reticulatus Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat may occur within area	In feature area

Listed Migratory Species		[Resource Information]	
Scientific Name	Threatened Category	Presence Text	Buffer Status
Migratory Marine Birds			
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area	In feature area
Migratory Terrestrial Species			
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat may occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area	In feature area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area	In feature area
Migratory Wetlands Species			
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris canutus Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area	In feature area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Pandion haliaetus			
Osprey [952]		Breeding known to occur within area	In feature area
Tringa nebularia			
Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area	In feature area

Other Matters Protected by the EPBC Act

Commonwealth Lands [Resource Information]

The Commonwealth area listed below may indicate the presence of Commonwealth land in this vicinity. Due to the unreliability of the data source, all proposals should be checked as to whether it impacts on a Commonwealth area, before making a definitive decision. Contact the State or Territory government land department for further information.

Commonwealth Land Name	State	Buffer Status
Communications, Information Technology and the Arts - Telstra Corporation Limited		
Commonwealth Land - Telstra Corporation Limited [11808]	NSW	In buffer area only

Listed Marine Species [Resource Information]

Scientific Name	Threatened Category	Presence Text	Buffer Status
Bird			
Actitis hypoleucos			
Common Sandpiper [59309]		Species or species habitat may occur within area	In feature area
Apus pacificus			
Fork-tailed Swift [678]		Species or species habitat likely to occur within area overfly marine area	In feature area
Bubulcus ibis as Ardea ibis			
Cattle Egret [66521]		Species or species habitat may occur within area overfly marine area	In feature area
Calidris acuminata			
Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area	In feature area
Calidris canutus			
Red Knot, Knot [855]	Endangered	Species or species habitat may occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area overfly marine area	In feature area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area overfly marine area	In feature area
Charadrius leschenaultii Greater Sand Plover, Large Sand Plover [877]	Vulnerable	Species or species habitat likely to occur within area	In feature area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat known to occur within area overfly marine area	In feature area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat known to occur within area	In feature area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Species or species habitat known to occur within area overfly marine area	In feature area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat known to occur within area overfly marine area	In feature area
Limosa lapponica Bar-tailed Godwit [844]		Species or species habitat known to occur within area	In buffer area only
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area overfly marine area	In feature area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat known to occur within area overfly marine area	In feature area
Neophema chrysostoma Blue-winged Parrot [726]	Vulnerable	Species or species habitat may occur within area overfly marine area	In feature area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area	In feature area
Pachyptila turtur Fairy Prion [1066]		Species or species habitat likely to occur within area	In buffer area only
Pandion haliaetus Osprey [952]		Breeding known to occur within area	In feature area
Pterodroma cervicalis White-necked Petrel [59642]		Species or species habitat may occur within area	In feature area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat known to occur within area overfly marine area	In feature area
Rostratula australis as Rostratula benghalensis (sensu lato) Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area overfly marine area	In feature area
Sterna striata White-fronted Tern [799]		Migration route may occur within area	In feature area
Symposiachrus trivirgatus as Monarcha trivirgatus Spectacled Monarch [83946]		Species or species habitat known to occur within area overfly marine area	In feature area

Scientific Name	Threatened Category	Presence Text	Buffer Status
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area overfly marine area	In feature area

Extra Information

State and Territory Reserves [Resource Information]

Protected Area Name	Reserve Type	State	Buffer Status
Lake Innes	Nature Reserve	NSW	In buffer area only

Regional Forest Agreements [Resource Information]

Note that all areas with completed RFAs have been included. Please see the associated resource information for specific caveats and use limitations associated with RFA boundary information.

RFA Name	State	Buffer Status
North East NSW RFA	New South Wales	In feature area

EPBC Act Referrals [Resource Information]

Title of referral	Reference	Referral Outcome	Assessment Status	Buffer Status
Cowarra Water Supply Scheme	2023/09581		Referral Decision	In feature area
Controlled action				
Oxley Highway to Kempsey Pacific Highway Upgrade, NSW	2012/6518	Controlled Action	Post-Approval	In buffer area only
Port Macquarie Airport Master Plan implementation and development activities, NSW	2016/7842	Controlled Action	Post-Approval	In feature area
Not controlled action				
Construction and operation of sewage treatment plant at Thrumster	2005/2312	Not Controlled Action	Completed	In feature area
Improving rabbit biocontrol: releasing another strain of RHDV, sthrn two thirds of Australia	2015/7522	Not Controlled Action	Completed	In feature area

Caveat

1 PURPOSE

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

The report contains the mapped locations of:

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

2 DISCLAIMER

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

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

3 DATA SOURCES

Threatened ecological communities

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

Threatened, migratory and marine species

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

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

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

4 LIMITATIONS

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

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

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

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

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

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

Acknowledgements

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

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

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

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

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7. Appendix B – Tests and Assessments of significance

EPBC Act Assessments of Significance

MNES – Endangered mammal species considered: • *Phascolarctos cinereus* – Koala • *Dasyurus maculatus* – Spotted Tailed Quoll	
Significant impact criteria	
An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:	
Statement	**Response**
• lead to a long-term decrease in the size of a population	The proposal is unlikely to result in a long-term decrease in the population size of the koala or spotted tail quoll given the subject site contains minimal suitable habitat, is historically fragmented and disturbed and therefore unlikely to support populations of these species.
• reduce the area of occupancy of the species	The proposal is unlikely to reduce the area of occupancy of the koala or spotted tail quoll given the limited extent of suitable habitat will be impacted
• fragment an existing population into two or more populations	The proposal is unlikely to fragment an existing koala or spotted tail quoll population into two or more populations given that no species were recorded on the site and the existing habitat would be unlikely to support populations of these species.
• adversely affect habitat critical to the survival of a species	The proposal is unlikely to adversely affect habitat critical to the survival of the koala or spotted tail quoll. Habitat for these species is well represented outside the subject site. Vegetation to be cleared as part of this proposal is generally in poor condition does not include primary feed trees or and has been impacted through prior activity.
• disrupt the breeding cycle of a population	The proposal will not disrupt the breeding cycle of the koala or spotted tail quoll. No populations koalas were observed during the field survey and more favourable habitat for this species is available outside the impact footprint.
• modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposal will not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that koalas are likely to decline. The proposal will occur in previously cleared and disturbed land, vegetation disturbance is minimal and temporary, and habitat is well represented outside the impact footprint.
• result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Given the specifications of the development, the proposal is unlikely to result in invasive species becoming established in the threatened species' habitat, any more than is already occurring.
• introduce disease that may cause the species to decline, or	The proposal will not result in disease that is harmful to threatened species becoming established in the threatened species' habitat. The subject site is already highly altered and disturbed.
• interfere substantially with the recovery of the species.	The proposal will not interfere substantially with the recovery of koalas or spotted tail quolls in this location. The species listed were not observed in the impact footprint with more suitable habitat available elsewhere.
Summary statement: The proposal will not result in a significant impact to koalas included in this assessment. No populations koalas are known to occur in the subject site. Disturbance will be temporary with more suitable habitat available outside the impact footprint.	
What is an important population of a species? An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are: • key source populations either for breeding or dispersal • populations that are necessary for maintaining genetic diversity, and/or • populations that are near the limit of the species range.	
What is an invasive species? An 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources, or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.	
What is habitat critical to the survival of a species or ecological community? 'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary: • for activities such as foraging, breeding, roosting, or dispersal	

• for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators) • to maintain genetic diversity and long term evolutionary development, or • for the reintroduction of populations or recovery of the species or ecological community. Such habitat may be but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act.

MNES – Endangered flora species considered:

- – Austral Toadflax
- – Brown Fairy chain Orchid
- – Byron Bay Diuris
- – Cryptic Forest Twiner
- – Leafless Tongue Orchid
- – Southern Swamp Orchid
- – Tinospora Vine
- – Willawarrin Doubletail
- – Spider Orchid

Significant impact criteria

An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:

Statement	Response
• lead to a long-term decrease in the size of a population	The proposal is unlikely to result in a long-term decrease in the population size of this species. No species was recorded at the time of this assessment. The limited extent of remnant vegetation within the subject site is unlikely to support a significant number of individuals with sufficient recruitment capacity to support a population.
• reduce the area of occupancy of the species	The proposal is unlikely to reduce the area of occupancy of this species given habitat for these species is well represented outside the subject site to the north, east and west.
• fragment an existing population into two or more populations	The proposal is unlikely to fragment an existing population into two or more populations. Areas where this species has potential to occur have historically been fragmented through prior clearing and landscape modification works to the degree where existing vegetation has limited potential to support populations of these species.
• adversely affect habitat critical to the survival of a species	The proposal is unlikely to adversely affect habitat critical to the survival of this species. Habitat for this species is well represented outside the subject site.
• disrupt the breeding cycle of a population	The proposal will not disrupt the breeding cycle of this species given that historical impact activity has limited the quality and extent of existing vegetation and its capacity to support the conditions required for a breeding cycle of a population.
• modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposal will not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that this species is likely to decline. Current habitat quality is low as a result of historical clearing and landscape modification works. Habitat is well represented outside the impact footprint.
• result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	Historical clearing and landscape modification works have resulted in invasive species becoming well established across the site. The proposal is unlikely to result in an increase in the extent of invasive species becoming established in the threatened species' habitat.
• introduce disease that may cause the species to decline, or	The proposal will not result in disease that is harmful to threatened species becoming established in the threatened species' habitat. The subject site is already highly altered and disturbed.
• interfere substantially with the recovery of the species.	The proposal will not interfere substantially with the recovery of these species. Species populations and habitat are well represented in areas outside the impact footprint.
Summary statement: The proposal will not result in a significant impact to this species. Impacts are expected to be localised and will impact a limited area disturbed vegetation which is generally of poor quality. Species populations and habitat are well represented in areas outside the impact footprint.	
What is an important population of a species?	

An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are: • key source populations either for breeding or dispersal • populations that are necessary for maintaining genetic diversity, and/or • populations that are near the limit of the species range.
What is an invasive species? An 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources, or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.
What is habitat critical to the survival of a species or ecological community? 'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary: • for activities such as foraging, breeding, roosting, or dispersal • for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators) • to maintain genetic diversity and long term evolutionary development, or • for the reintroduction of populations or recovery of the species or ecological community. Such habitat may be but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act.

MNES - Vulnerable fauna species:

- ***Monarcha melanopsis* - Black-faced Monarch**
- ***Myiagra cyanoleuca* - Satin Flycatcher**
- ***Symposiachrus trivirgatus* - Speckled Monarch**

Significant impact criteria

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

Statement	Response
• lead to a long-term decrease in the size of an important population of a species	The proposal is unlikely to lead to a long-term decrease in the size of an important population of these migratory bird species. No individuals were recorded within the impact footprint. The proposal will only impact small area of potential habitat for these species. Suitable habitat is well represented and available in the surrounding areas.
• reduce the area of occupancy of an important population	The proposal will not affect the area of occupancy of these migratory bird species. No individuals were identified to occur within the impact area at the time of the survey. Suitable habitat is well represented and available in the surrounding areas.
• fragment an existing important population into two or more populations	The proposal will not fragment an existing important population of these species. No important populations were recorded within the impact footprint. Current potential habitat has been reduced to a size where suitable habitat is unlikely to fragment populations. Habitat is well represented outside the impact footprint.
• adversely affect habitat critical to the survival of a species	Adverse impacts on critical habitat are unlikely as suitable foraging habitat will largely be avoided. The proposal will only impact a small area of potential habitat for these species. Suitable habitat is well represented and available in the surrounding areas.
• disrupt the breeding cycle of an important population	The proposal will not disrupt the breeding cycle as breeding habitat is well represented and available outside the impact footprint.
• modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	The proposal will not modify, destroy, remove, isolate, or decrease the availability or quality of habitat to the extent that these species are likely to decline. Suitable foraging habitat will largely be avoided.
• result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat	The proposal is unlikely to result in invasive species becoming established in the threatened species' habitat, any more than is already occurring.
• introduce disease that may cause the species to decline, or	The proposal will not result in disease that is harmful to threatened species becoming established in the threatened species' habitat. The subject site is already highly altered and disturbed.

• interfere substantially with the recovery of the species.	The proposal will not interfere substantially with the recovery of these species. These species were not observed within the subject site. Any impacts will be temporary, with more suitable habitat represented outside the impact footprint.

Summary statement:

The proposal will not result in a significant impact to these migratory bird species or extent of habitat trees will be cleared more suitable habitat is available outside the impact footprint.

What is an important population of a species?

An 'important population' is a population that is necessary for a species' long-term survival and recovery. This may include populations identified as such in recovery plans, and/or that are:
• key source populations either for breeding or dispersal
• populations that are necessary for maintaining genetic diversity, and/or
• populations that are near the limit of the species range.

What is an invasive species?

An 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.

What is habitat critical to the survival of a species or ecological community?

'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:
• for activities such as foraging, breeding, roosting, or dispersal
• for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
• to maintain genetic diversity and long-term evolutionary development, or
• for the reintroduction of populations or recovery of the species or ecological community.
Such habitat may be, but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act.

BC Act Tests of Significance

BC Act Threatened Species Test of Significance for mammal species: • ***Cercartetus nanus* - Eastern Pygmy Possum** • ***Aepyprymnus rufescens* - Rufous Bettong** • ***Planigale maculata* - Common Phlanigale** • ***Phascolarctos cinereus* - Koala** • ***Dasyurus masculatus* - Spotted-tailed Quoll** • ***Pseudomys gracilicaudatus* - Eastern Chestnut Mouse**	
Significant impact criteria - An action is likely to have a significant impact on a protected matter if there is a real chance or possibility that it will have:	
Statement	**Response**
Adverse effects on the life cycle of a species (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	The proposal will not disrupt the breeding cycle of these species. No populations of the species listed were observed during the field survey and more favourable habitat for this species is available outside the impact footprint.
Adverse effects on ecological communities (b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	N/A
Adverse effects on habitats (c) in relation to the habitat of a threatened species or ecological community: (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	The proposal will not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that this species is likely to decline. The proposal occurs on previously cleared and disturbed land, vegetation disturbance is minimal with more suitable habitat available in the surrounding areas.
Adverse effects on areas of outstanding biodiversity value (d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)	The proposal does not occur in mapped Areas of Outstanding Biodiversity Value and will not have an adverse impact on any declared area of outstanding biodiversity value.
Key threatening processes (e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process	The proposal has the potential to exacerbate removal of native vegetation and removal of bushrock. The proposal will have a negligible contribution to human made climate change.
Summary statement: The proposal will not result in a significant impact to the species listed. No populations of this species is known to occur in the study area. Disturbance will be temporary with more favourable habitat available outside the impact footprint.	
In determining the nature and magnitude of an impact, matters were considered such as: • pre-construction, construction and occupation/maintenance phases • all on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones • all direct and indirect impacts • the frequency and duration of each known or likely impact/action • the total impact which can be attributed to that action over the entire geographic area affected, and over time • the sensitivity of the receiving environment • the degree of confidence with which the impacts of the action are known and understood. All factors should be considered as well as any other information considered relevant to the test. Sources and currency of data and information are to be documented and referenced. Limitations, uncertainties and known gaps in information are also to be documented to inform the decision-maker	

BC Act Threatened Species Test of Significance for woodland bird species:

- ***Climacteris picumnus*** **- Brown Treecreeper (eastern subspecies)**
- ***Stagonopleura guttata*** **- Diamond firetail**
- ***Artamus cyanopterus*** **- Dusky Woodswallow**
- ***Pomatostomus temporalis*** **- Grey-crowned Babbler**
- **Melanodryas cucullata cucullata - Hooded Robin (south eastern form)**
- ***Amaurornis moluccana*** **- Pale-vented Bush-hen**
- ***Turnix maculosus*** **- Red-backed Button Quail**
- ***Petroica boodang*** **- Scarlett Robin**
- ***Ptilinopus superbus*** **- Superb Fruit-dove**
- **Ptilinopus magnificus - Wampoo Fruit-dove**
- **Epthianura albifrons - White-fronted Chat**
- ***Calyptorhynchus lathami lathami*** **- South-eastern Glossy Black Cockatoo**

Significant impact criteria - An action is likely to have a significant impact on a protected matter if there is a real chance or possibility that it will have:

Statement	Response
Adverse effects on the life cycle of a species (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	The proposal is unlikely to disrupt the lifecycle of these species such that a viable local population will be placed at risk of extinction. No populations were observed within the impact footprint during the survey. The proposal occurs on previously cleared and disturbed land and will impact a small amount of potential nesting habitat for these species with habitat well represented outside the impact footprint. The proposal may impact potential foraging habitat for the Glossy Black Cockatoo. However Suitable foraging habitat is located adjacent to the subject site and in areas to the north. The proposal occurs on previously cleared and disturbed land and will impact a small amount of foraging habitat for this species with habitat well represented outside the impact footprint.
Adverse effects on ecological communities (b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	N/A
Adverse effects on habitats (c) in relation to the habitat of a threatened species or ecological community: (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	The proposal will not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that this species is likely to decline. The proposal occurs on previously cleared and disturbed land and will only temporarily impact a small amount of potential nesting habitat for these species with habitat well represented outside the impact footprint.
Adverse effects on areas of outstanding biodiversity value (d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)	The proposal does not occur in mapped Areas of Outstanding Biodiversity Value and will not have an adverse impact on any declared area of outstanding biodiversity value.
Key threatening processes (e) whether the proposed development or activity is or is part	The proposal may exacerbate removal of native vegetation. Current vegetation species are unlikely

of a key threatening process or is likely to increase the impact of a key threatening process	to develop hollow bearing features. The overall impact will have a negligible contribution to human made climate change.
Summary statement: The proposal will not result in a significant impact to these bird species. No populations of these species is known to rely on the subject site for habitat or survival. More favourable habitat is available adjacent to the impact footprint.	
In determining the nature and magnitude of an impact, matters were considered such as: • pre-construction, construction and occupation/maintenance phases • all on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones • all direct and indirect impacts • the frequency and duration of each known or likely impact/action • the total impact which can be attributed to that action over the entire geographic area affected, and over time • the sensitivity of the receiving environment • the degree of confidence with which the impacts of the action are known and understood. All factors should be considered as well as any other information considered relevant to the test. Sources and currency of data and information are to be documented and referenced. Limitations, uncertainties and known gaps in information are also to be documented to inform the decision-maker	

BC Act Threatened Species Test of Significance for Forest Owls and Birds Of Prey species: • **Ninox connivens- Barking Owl** • ***Tyto longimembris* – *Eastern* Grass Owl** • ***Ninox strenua* - Powerful Owl** • ***Circus assimilis* - Spotted Harrier** • ***Hieraaetus morphnoides* - Little Eagle** • ***Lophoictinia isura* -Square Tailed Kite**	
Significant impact criteria - An action is likely to have a significant impact on a protected matter if there is a real chance or possibility that it will have:	
Statement	**Response**
Adverse effects on the life cycle of a species (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	The proposal is unlikely to disrupt the lifecycle of these species such that a viable local population will be placed at risk of extinction. No populations were observed within the impact footprint during the survey. The proposal occurs on previously cleared and disturbed land and will impact a small amount of potential foraging habitat for these species with habitat well represented outside the impact footprint. No large hollow-bearing trees occur in the study area. Trees of a suitable height for nesting sites for the Little Eagle and Square Tailed Kites do not occur in the subject site.
Adverse effects on ecological communities (b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	N/A
Adverse effects on habitats (c) in relation to the habitat of a threatened species or ecological community: (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the	The proposal will not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that this species is likely to decline. The proposal occurs on previously cleared and disturbed land and will only temporarily impact a small amount of potential nesting habitat for these species with habitat well represented outside the impact footprint.

locality	
Adverse effects on areas of outstanding biodiversity value (d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)	The proposal does not occur in mapped Areas of Outstanding Biodiversity Value and will not have an adverse impact on any declared area of outstanding biodiversity value.
Key threatening processes (e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process	The proposal may exacerbate removal of native vegetation. Current vegetation species are unlikely to develop hollow bearing features. The overall impact will have a negligible contribution to human made climate change.
The proposal will not result in a significant impact to these bird species. No populations of these species is known to rely on the subject site for habitat or survival. More favourable habitat is available adjacent to the impact footprint.	
In determining the nature and magnitude of an impact, matters were considered such as: • pre-construction, construction and occupation/maintenance phases • all on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones • all direct and indirect impacts • the frequency and duration of each known or likely impact/action • the total impact which can be attributed to that action over the entire geographic area affected, and over time • the sensitivity of the receiving environment • the degree of confidence with which the impacts of the action are known and understood. All factors should be considered as well as any other information considered relevant to the test. Sources and currency of data and information are to be documented and referenced. Limitations, uncertainties and known gaps in information are also to be documented to inform the decision-maker	

BC Act Threatened Species Test of Significance for flora species: • ***Thesium australe* - Austral Toadflax** • ***Diuris byronensis* - Byron Bay Diuris** • ***Tylophora woollsii* - Cryptic Forest Twiner** • **Cryptostylis hunteriana - Leafless Tongue Orchid** • ***Phaius australis* - Southern Swamp Orchid** • ***Tinospora smilacina* - Tinospora Vine** • ***Diuris disposita* - Willawarrin Doubletail**	
Significant impact criteria - An action is likely to have a significant impact on a protected matter if there is a real chance or possibility that it will have:	
Statement	**Response**
Adverse effects on the life cycle of a species (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	The proposal is unlikely to disrupt the lifecycle of this species such that a viable local population will be placed at risk of extinction. No species was recorded at the time of this assessment. Whilst many threatened herbs and orchids are cryptic in nature, previous disturbances and the limited extent of remnant vegetation within the subject site is unlikely to support a significant number of individuals with sufficient recruitment capacity to support a population.
Adverse effects on ecological communities (b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	N/A
Adverse effects on habitats (c) in relation to the habitat of a threatened species or ecological community: (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) whether an area of habitat is likely to become	The proposal will not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that this species is likely to decline. Areas where this species has potential to occur have historically been fragmented through prior clearing and landscape modification works to the degree where existing vegetation has limited potential to

fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	support populations of these species.
Adverse effects on areas of outstanding biodiversity value (d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)	The proposal does not occur in mapped Areas of Outstanding Biodiversity Value and will not have an adverse impact on any declared area of outstanding biodiversity value.
Key threatening processes (e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process	The proposal may exacerbate removal of native vegetation and bushrock. The proposal will have a negligible contribution to human made climate change.
Summary statement: The proposal will not result in a significant impact to these plant species. No populations of these species is known to rely on the subject site for habitat or survival. Impacts are expected to be limited to the subject site.	
In determining the nature and magnitude of an impact, matters were considered such as: • pre-construction, construction and occupation/maintenance phases • all on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones • all direct and indirect impacts • the frequency and duration of each known or likely impact/action • the total impact which can be attributed to that action over the entire geographic area affected, and over time • the sensitivity of the receiving environment • the degree of confidence with which the impacts of the action are known and understood. All factors should be considered as well as any other information considered relevant to the test. Sources and currency of data and information are to be documented and referenced. Limitations, uncertainties and known gaps in information are also to be documented to inform the decision-maker	

- ***BC Act Threatened Species Test of Significance for Bat species***
- ***Vespadelus troughtoni - Eastern Cave Bat***
- ***Saccolaimus flaviventris – Yellow-bellied Sheathtail Bat***
- ***Micronomus norfolkensis - Eastern Coastal Free-Tailed Bat***
- ***Falsistrellus tasmaniensis - Eastern False Pippistrelle***
- ***Nyctophilus bifax - Eastern Long-eared Bat***
- ***Scoteanax rueppellii - Greater Broad-nosed Bat***
- ***Miniopterus orianae oceanensis - Large Bent-wing Bat***
- ***Miniopterus australis - Little Bent-wing Bat***
- ***Myotis macropus - Southern Myotis***

Significant impact criteria - An action is likely to have a significant impact on a protected matter if there is a real chance or possibility that it will have:

Statement	Response
Adverse effects on the life cycle of a species (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	The proposal is unlikely to disrupt the lifecycle of these species such that a viable local population will be placed at risk of extinction. No populations were observed within the impact footprint during the survey. The proposal occurs on previously cleared and disturbed land and will impact a small amount of potential roosting and feeding habitat for these insectivorous bat species with habitat well represented outside the impact footprint. No suitable roosting habitat for tree-dependent bats was noted (i.e decorticating bark, hollows ect).
Adverse effects on ecological communities (b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	N/A

Adverse effects on habitats (c) in relation to the habitat of a threatened species or ecological community: (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	The proposal will not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that this species is likely to decline. The proposal occurs on previously cleared and disturbed land and will only temporarily impact a small amount of potential roosting and feeding habitat for these species with habitat well represented outside the impact footprint. Around 0.37 ha of foraging habitat would be removed.
Adverse effects on areas of outstanding biodiversity value (d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)	The proposal does not occur in mapped Areas of Outstanding Biodiversity Value and will not have an adverse impact on any declared area of outstanding biodiversity value.
Key threatening processes (e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process	The proposal may exacerbate removal of native vegetation. Current vegetation species are unlikely to develop hollow bearing features. The overall impact will have a negligible contribution to human made climate change.
The proposal will not result in a significant impact to these bat species. No populations of these species is known to rely on the subject site for habitat or survival. More favourable habitat is available adjacent to the impact footprint.	
In determining the nature and magnitude of an impact, matters were considered such as: • pre-construction, construction and occupation/maintenance phases • all on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones • all direct and indirect impacts • the frequency and duration of each known or likely impact/action • the total impact which can be attributed to that action over the entire geographic area affected, and over time • the sensitivity of the receiving environment • the degree of confidence with which the impacts of the action are known and understood. All factors should be considered as well as any other information considered relevant to the test. Sources and currency of data and information are to be documented and referenced. Limitations, uncertainties and known gaps in information are also to be documented to inform the decision-maker	

BC Act Threatened Species Test of Significance for Reptile species • **Hoplocephalus bitorquatus - Pale-headed Snake**	
Significant impact criteria - An action is likely to have a significant impact on a protected matter if there is a real chance or possibility that it will have:	
Statement	**Response**
Adverse effects on the life cycle of a species (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	The proposal is unlikely to disrupt the lifecycle of the Pale headed snake. This species relies on tree hollows as primary habitat. As such a viable local population will not be placed at risk of extinction. No populations were observed within the impact footprint during the survey. The proposal occurs on previously cleared and disturbed land and will impact a small amount of potential habitat for this species with habitat well represented outside the impact footprint
Adverse effects on ecological communities (b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	N/A
Adverse effects on habitats (c) in relation to the habitat of a threatened species or ecological community:	The proposal will not modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that this species is likely to

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	decline. The proposal occurs on previously cleared and disturbed land and will only temporarily impact a small amount of potential habitat for this species with habitat well represented outside the impact footprint.
Adverse effects on areas of outstanding biodiversity value (d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)	The proposal does not occur in mapped Areas of Outstanding Biodiversity Value and will not have an adverse impact on any declared area of outstanding biodiversity value.
Key threatening processes (e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process	The proposal may exacerbate removal of native vegetation and bushrock. Current vegetation The overall impact will have a negligible contribution to human made climate change.
The proposal will not result in a significant impact to this reptile species. No populations of these species is known to rely on the subject site for habitat or survival. More favourable habitat is available adjacent to the impact footprint.	
In determining the nature and magnitude of an impact, matters were considered such as: • pre-construction, construction and occupation/maintenance phases • all on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones • all direct and indirect impacts • the frequency and duration of each known or likely impact/action • the total impact which can be attributed to that action over the entire geographic area affected, and over time • the sensitivity of the receiving environment • the degree of confidence with which the impacts of the action are known and understood. All factors should be considered as well as any other information considered relevant to the test. Sources and currency of data and information are to be documented and referenced. Limitations, uncertainties and known gaps in information are also to be documented to inform the decision-maker	

BC Act Test of Significance for threatened ecological communities: **Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregion (for PCT 4047)** **Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (for PCT 4004 and 4047)**	
Significant impact criteria - An action is likely to have a significant impact on a protected matter if there is a real chance or possibility that it will have:	
Statement	**Response**
Adverse effects on the life cycle of a species (a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction	N/A
Adverse effects on ecological communities (b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: (i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or (ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction	The proposal is unlikely to reduce the extent of this community long-term. Under the scope of the proposal the impact footprint will be limited to the subject site and avoid any disturbance to the adjacent EEC.
Adverse effects on habitats (c) in relation to the habitat of a threatened species or ecological community: (i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and (ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and (iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality	A small amount of native vegetation with limited habitat value (i.e. no hollow bearing trees, logs) will be impacted under the proposal. Specifically, 0.25 ha of PCT4004 and 0.12 ha of PCT4047would be impacted in the subject site (including access road). The remainder of the site has been significantly modified through prior disturbance and currently comprises mostly of invasive species with some native plant regeneration.
Adverse effects on areas of outstanding biodiversity value (d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly)	The proposal will not have an adverse effect on any declared area of outstanding biodiversity value.
Key threatening processes (e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process	The proposal will impact a small area of native vegetation (~0.37 ha).
Summary statement: The proposal will not result in a significant impact to either EEC. The subject site is already disturbed in places with the impact footprint largely occurs within cleared residential/agricultural land. Any impacts will be temporary, and vegetation will re-establish where it currently occurs.	
In determining the nature and magnitude of an impact, matters were considered such as: • pre-construction, construction and occupation/maintenance phases • all on-site and off-site impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones • all direct and indirect impacts • the frequency and duration of each known or likely impact/action • the total impact which can be attributed to that action over the entire geographic area affected, and over time • the sensitivity of the receiving environment • the degree of confidence with which the impacts of the action are known and understood. All factors should be considered as well as any other information considered relevant to the test. Sources and currency of data and information are to be documented and referenced. Limitations, uncertainties and known gaps in information are also to be documented to inform the decision-maker	

Appendix C – AHIMS Search Results

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : 794565 Sovereign Hills

Client Service ID : 929097

Essential Energy Land & Routes Port Macquarie
8 Buller St
Port Macquarie New South Wales 2444
Attention: Nathan Hegerty
Email: nathan.hegerty@essentialenergy.com.au

Date: 10 September 2024

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -31.4512, 152.8299 - Lat, Long To : -31.4466, 152.8376, conducted by Nathan Hegerty on 10 September 2024.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

2	**Aboriginal sites are recorded in or near the above location.**
0	**Aboriginal places have been declared in or near the above location. ***

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Level 6, 10 Valentine Ave, Parramatta 2150
Locked Bag 5020 Parramatta NSW 2124
Tel: (02) 9585 6345

ABN 34 945 244 274
Email: ahims@environment.nsw.gov.au
Web: www.heritage.nsw.gov.au

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 794565 Sovereign Hills

Client Service ID : 929099

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
30-3-0207	Brettar 1	AGD	56	484010	6520580	Open site	Valid	Artefact : -	Open Camp Site	4024,98713
	Contact	**Recorders**	Ms.Jacqueline Collins					**Permits**		
30-3-0335	Watoo 10	AGD	56	484272	6520522	Open site	Valid	Artefact : 1		
	Contact	**Recorders**	Ms.Jacqueline Collins					**Permits**		

**** Site Status**

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

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

Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

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

Report generated by AHIMS Web Service on 10/09/2024 for Nathan Hegerty for the following area at Lat, Long From : -31.4512, 152.8299 - Lat, Long To : -31.4466, 152.8376. Number of Aboriginal sites and Aboriginal objects found is 2