Appendix M

Bushfire

MARINUS LINK

Marinus Link - Victorian Bushfire Impact Assessment

Marinus Link Pty Ltd

May 2024

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DOCUMENT TRACKING

Project Name	Marinus Link: Victorian Bushfire Impact Assessment
Project Number	23SYD 4484
Project Manager	JN
Prepared by	JN, NK
Reviewed by	NK
Approved by	NK
Status	**Final**
Last saved on	**23 May 2024**

This report should be cited as 'Eco Logical Australia. 2024. Marinus Link Victorian Bushfire Impact Assessment. Prepared for Marinus Link Pty Ltd.'

ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd with support from Tetra Tech Coffey Pty Ltd and Marinus Link Pty Ltd.

Template 2.8.1

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Executive Summary

Marinus Link Pty Ltd (MLPL) proposes to construct a high voltage direct current electricity interconnector between Tasmania and Victoria, including a subsea cable and onshore cable (comprised of dual transmission lines) and converter facilities.

The aim of this report is to address both the *Environmental Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) Environmental Impact Statement (EIS) guidelines of the Department of Climate Change, Energy, the Environment and Water; and the Environment Effects Statement (EES) scoping requirements of the Victorian Minister for Planning, as prepared by the Department of Transport and Planning (DTP 2023) for Marinus Link (the project).

As the project is proposed to be located within three jurisdictions, the Victorian Department of Transport and Planning (DTP), Tasmanian Environment Protection Authority (Tasmanian EPA) and Australian Department of Climate Change, Energy, Environment and Water (DCCEEW) have agreed to coordinate the administration and documentation of the three assessment processes. One EIS/EES is being prepared to address the requirements of DTP and DCCEEW. Two EISs are being prepared to address the Tasmanian EPA requirements for the Heybridge converter station and shore crossing.

The requirements for a bushfire assessment for the Victorian component of the project is outlined in the EES scoping requirements.

The core EES requirement is that *"the EES is to investigate and document the potential environmental effects (direct and/or indirect) of the proposed project, including for any relevant alternatives, as well as associated environmental avoidance, mitigation and management measures".* The EES evaluation objective contained in Section 4.5 of the EES scoping requirements that is relevant to this bushfire assessment is: "*Avoid and, where avoidance is not possible, minimise adverse effects on community amenity, health and safety, with regard to noise, vibration, air quality including dust, the transport network, greenhouse gas emissions, fire risk and electromagnetic fields.*"

This report establishes the bushfire assessment framework for the Victorian section of the proposed project. It presents the findings of detailed bushfire investigations and an associated Bushfire Impact Assessment (BIA).

The BIA involved the following steps:

- A desktop assessment to identify bushfire impacts which potentially may occur with the project. The assessment identifies the bushfire hazard and assets at risk.
- An analysis of the bushfire risk context of the project sites of Hazelwood, Driffield and Waratah Bay. The bushfire risk assessment covers the construction, operational, and decommissioning phases of the project.
- An analysis of the potential bushfire impacts of the project, undertaken based on a 'risk assessment' approach.
- Development of Environmental Performance Requirements (EPR) to mitigate impacts identified during the BIA.

From the BIA undertaken on the sites of Waratah Bay, Driffield, Hazelwood and the cabling route for the construction, operation, and decommissioning stages of the project, the level of initial risk was determined as minor or insignificant across all vulnerability risk criteria. This initial level of risk assigned for each site has taken into consideration the hazard context, fire history and frequency in the landscape, surrounding land use. This BIA also recommends compliance with Environmental Performance Requirements (EPR) that set out the requirements that need to be achieved to minimise risk impact (residual risk).

Section 7.8 of this BIA summarises the highest assigned bushfire risk impact for life and property assets across all sites and project stages. The initial risk assessment for all sites determined the overall risk to be minor. With implementation of assigned EPR's to all stages of the project, the highest residual risk was determined to be reduced to insignificant.

Key EPR identified in the BIA in response to the EIS Guidelines and EES scoping requirements identified the need for compliance measures assigned targeting bushfire ignition management, bulk static water capacity, access, operations maintenance design (Asset Protection Zones (APZs)) and bushfire emergency management planning.

In response to the Commonwealth EIS guidelines and Victorian EES scoping requirements, the introduction and implementation of EPR's (as identified in Section 7.1 to Section 7.3) will significantly lower the risk of potential impacts from the proposed development to life; property (including human settlement, agricultural and plantation assets); and environment to be of insignificant risk. This is assessed as an acceptable risk mitigation outcome for the project.

Glossary and Abbreviations

Glossary of Terms

Term	Description
Assets	Anything valued by people which includes houses, infrastructure, crops, forests and, in many cases, the environment.
Asset Protection Zone	A fuel-reduced area surrounding a built asset or structure which provides a buffer zone and defendable space for fire fighting between a bush fire hazard and an asset as well as mitigation of the severity of bushfire attack on the asset.
Bushfire	Unplanned vegetation fire. A generic term which includes grass fires, forest fires and scrub fires both with and without a suppression objective.
Bushfire risk	The chance of a bushfire igniting, spreading and causing damage to the community or assets of value.
Consequence	The outcome or impact of a bushfire event.
Fire break	A fire break is a gap in fuel (vegetation) that reduces the potential for fire to enter or leave an area. Fire breaks may be used for emergency vehicle access.
Fire management	All activities associated with the management of fire prone land, including the use of fire to meet land management goals and objectives.
Fuel hazard	Fine fuels in bushland that burn in the continuous flaming zone at the fire's edge. These fuels contribute the most to the fire's rate of spread, flame height and intensity. Typically, they are dead plant material, such as leaves, grass, bark and twigs thinner than 6 mm thick, and live plant material thinner than 3 mm thick.
High Risk Area	Area in the natural landscape which is located in both a Bushfire Prone Area and the Bushfire Management Overlay, with sloping terrain, continuity of high bushfire hazard vegetation types such as Forest, and is subject to increased occurrences of unplanned bushfire activity.
Intensity	The rate of energy release per unit length of fire front usually expressed in kilowatts per metre (Kw/m).
Likelihood	The probability of a fire igniting and spreading, and how often this may occur.

Most terms are taken from the Bushfire Glossary prepared by the Australasian Fire and Emergency Service Authorities Council Limited (AFAC).

Abbreviations

Abbreviation	Description
APZ	Asset Protection Zone
BIA	Bushfire Impact Assessment
BMO	Bushfire Management Overlay
BPA	Bushfire Prone Area
CFA	Country Fire Authority
DCCEEW	Department of Climate Change, Energy, Environment and Water
DEECA	Department of Energy, Environment, and Climate Action
DTP	Victorian Department of Transport and Planning
EES	Environment Effects Statement
EEA	*Environment Effects Act 1978* (Vic)
EIS	Environmental Impact Statement
ELA	Eco Logical Australia
EMPCA	*Environmental Management and Pollution Control Act 1994* (Tas)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth)
EPR	Environmental Performance Requirements
FBI	Fire Behaviour Index
FDR	Fire Danger Rating
HDD	Horizontal Directional Drilling
HVAC	High Voltage Alternate Current
HVDC	High Voltage Direct Current
MNES	Matters of National Environmental Significance as defined under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth).
MW	Megawatt
NEM	National Energy Market
PEA	*Planning and Environmental Act 1987* (Vic)

1. Introduction

The proposed Marinus Link (the project) comprises a high voltage direct current (HVDC) electricity interconnector between Tasmania and Victoria, to allow for the continued trading and distribution of electricity within the National Energy Market (NEM).

The project was referred to the Australian Minister for the Environment 5 October 2021. On 4 November 2021, a delegate of the Minister for the Environment determined that the proposed action is a controlled action as it has the potential to have a significant impact on the environment and requires assessment and approval under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act) before it can proceed. The delegate determined that the appropriate level of assessment under the EPBC Act is an environmental impact statement (EIS).

On 12 December 2021, the former Victorian Minister for Planning under the *Environment Effects Act 1978* (Vic) (EE Act) determined that the project requires an environment effects statement (EES) under the EE Act, to describe the project's effects on the environment to inform statutory decision making.

In July 2022, a delegate of the Director of the Environment Protection Authority Tasmania determined that the project be subject to environmental impact assessment by the Board of the Environment Protection Authority (the Board) under the *Environmental Management and Pollution Control Act 1994* (Tas) (EMPCA).

As the project is proposed to be located within three jurisdictions, the Victorian Department of Transport and Planning (DTP), Tasmanian Environment Protection Authority (Tasmanian EPA) and Australian Department of Climate Change, Energy, Environment and Water (DCCEEW) have agreed to coordinate the administration and documentation of the three assessment processes. One EIS/EES is being prepared to address the requirements of DTP and DCCEEW. Two EISs are being prepared to address the Tasmanian EPA requirements for the Heybridge converter station and shore crossing.

This report has been prepared by Eco Logical Australia (ELA) for the Victorian jurisdiction as part of the EIS/EES being prepared for the project.

1.1 Purpose of this Report

The purpose of this report is to assist in addressing the bushfire specific requirements as part of the preparation of an EES under the EE Act in accordance with the 'scoping requirements' criteria guidelines issued by the Victorian Minister for Planning. The criteria under the Victorian EES scoping requirements relevant to the study area for the project are detailed in Section 2.2.

In addition, this report will be assessed against the bushfire requirements prescribed through Clause 13.02-1S of the Victorian Planning Policy Framework and the *Planning and Environment Act 1987* (Vic) (PEA Act). These legislation, policy, and guidelines are further covered in Section 3.

1.2 Project Overview

The project is a proposed 1500 megawatt (MW) HVDC electricity interconnector between Heybridge in northwest Tasmania and the Latrobe Valley in Victoria (Figure 1). Figure 2, Figure 3, and Figure 4 present the project layouts for the Waratah Bay site as well as site alternatives at Driffield or Hazelwood). Marinus Link is proposed to provide a second link between the Tasmanian renewable energy resources

and the Victorian electricity grids enabling efficient energy trade, transmission and distribution from a diverse range of generation sources to where it is most needed, and will increase energy capacity and security across the NEM.

Marinus Link Pty Ltd (MLPL) is the proponent for the project and is a wholly owned subsidiary of Tasmanian Networks Pty Ltd (TasNetworks). TasNetworks is owned by the State of Tasmania and owns, operates and maintains the electricity transmission and distribution network in Tasmania.

Tasmania has significant renewable energy resource potential, particularly hydroelectric power and wind energy. The potential size of the resource exceeds both the Tasmanian demand and the capacity of the existing Basslink interconnector between Tasmania and Victoria. The growth in renewable energy generation in mainland states and territories participating in the NEM, coupled with the retiring of baseload coal-fired generators, is reducing the availability of dispatchable generation that is available on demand.

Tasmania's existing and potential renewable resources are a valuable source of dispatchable generation that could benefit electricity supply in the NEM. Marinus Link will allow for the continued trading, transmission and distribution of electricity within the NEM. It will also manage the risk to Tasmania of a single interconnector across Bass Strait and complement existing and future interconnectors on mainland Australia. Marinus Link is expected to facilitate the reduction in greenhouse gas emissions at a state and national level.

Interconnectors are a key feature of the future energy landscape. They allow power to flow between different regions to enable the efficient transfer of electricity from renewable energy zones to where the electricity is needed. Interconnectors can increase the resilience of the NEM and make energy more secure, affordable and sustainable for customers. Interconnectors are common around the world including in Australia. They play a critical role in supporting Australia's transition to a clean energy future.

1.3 Assessment Context

Assessment of impacts from bushfire events is a key consideration at all levels of government in Australia. The purpose of a BIA is to understand the risk to a project site(s) from potential bushfire occurrence in the surrounding area. It also considers the risk from a proposed project to causing a bushfire or affecting bushfire management. The assessment will identify measures in which these risks can be avoided altogether or minimised.

Overall, the bushfire assets requiring protection in this context include:

- Life (human populations);
- Property (human settlement, infrastructure, pine plantation, and agricultural lands); and
- Environment.

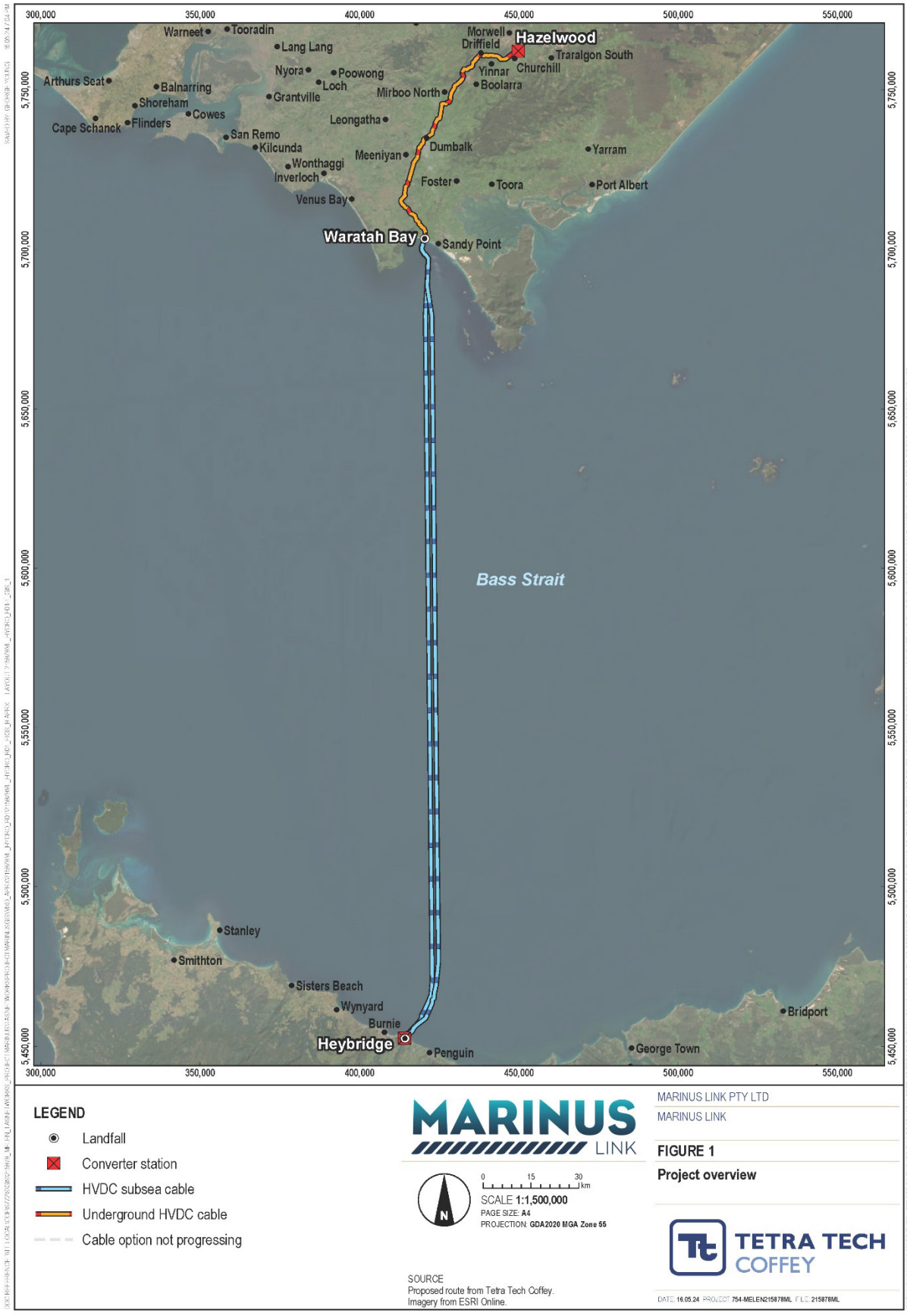


Figure 1: Project Overview

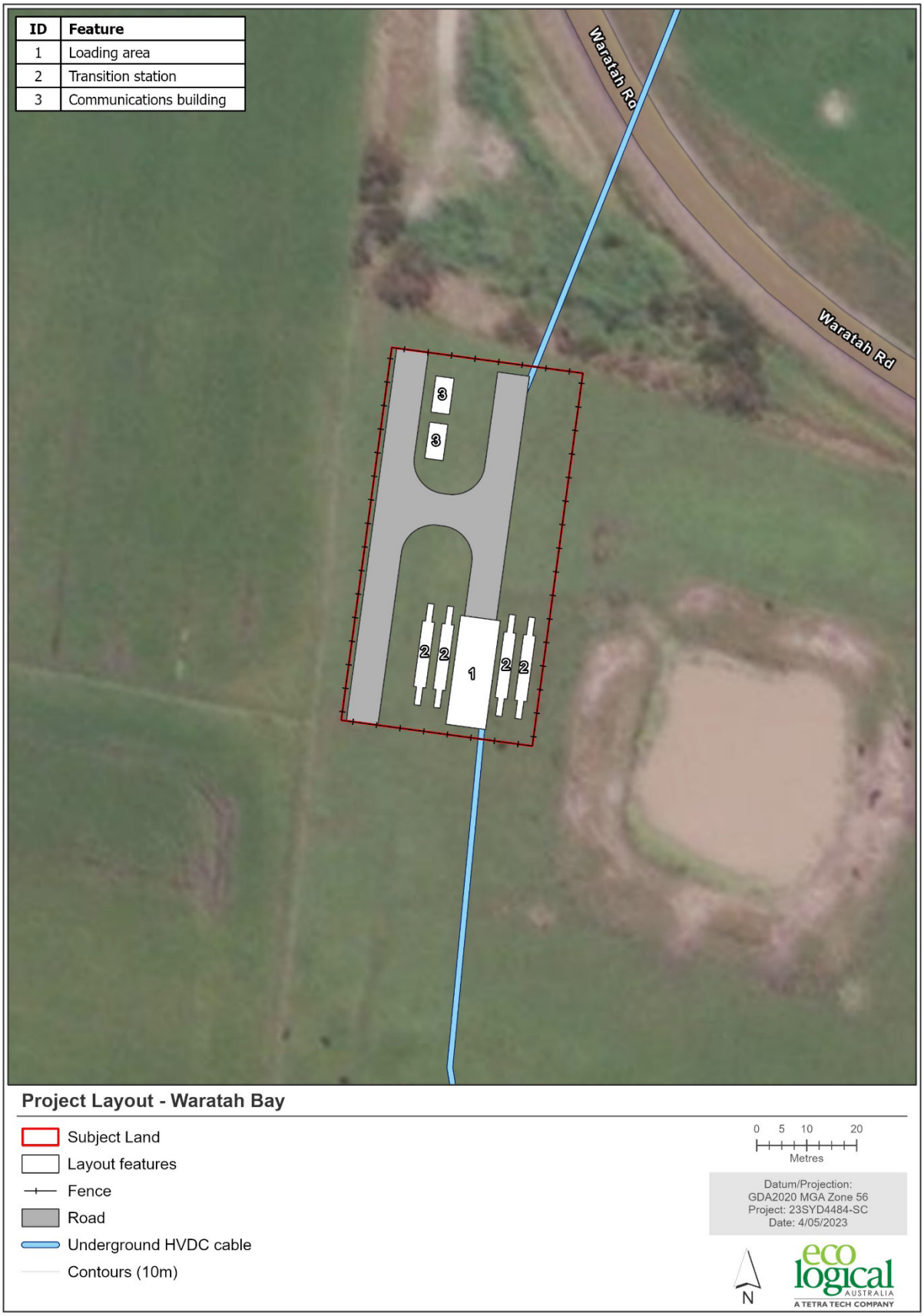


Figure 2: Proposed Layout of the Waratah Bay Site (Transition Station)

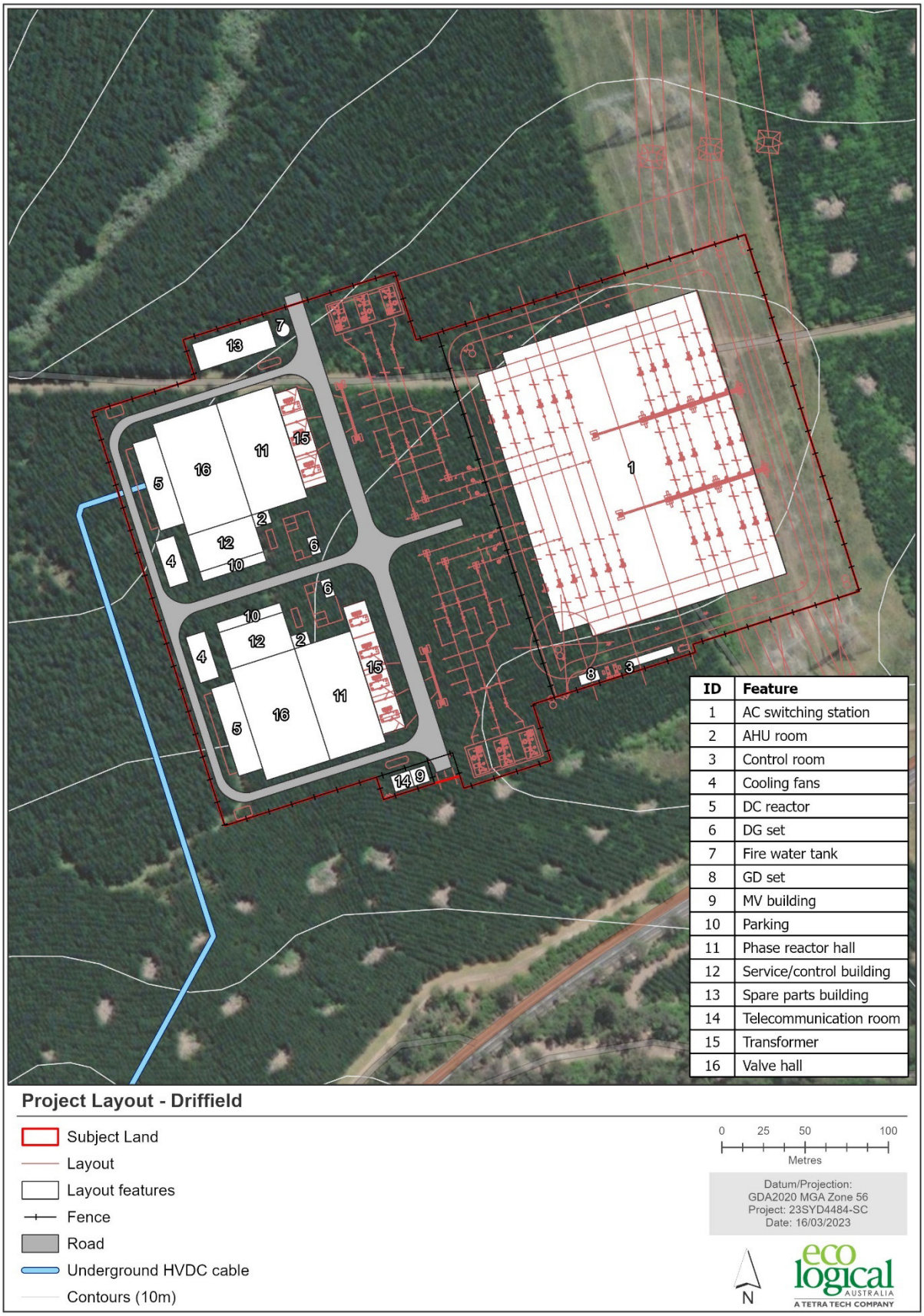


Figure 3: Proposed Layout of the Driffield Site

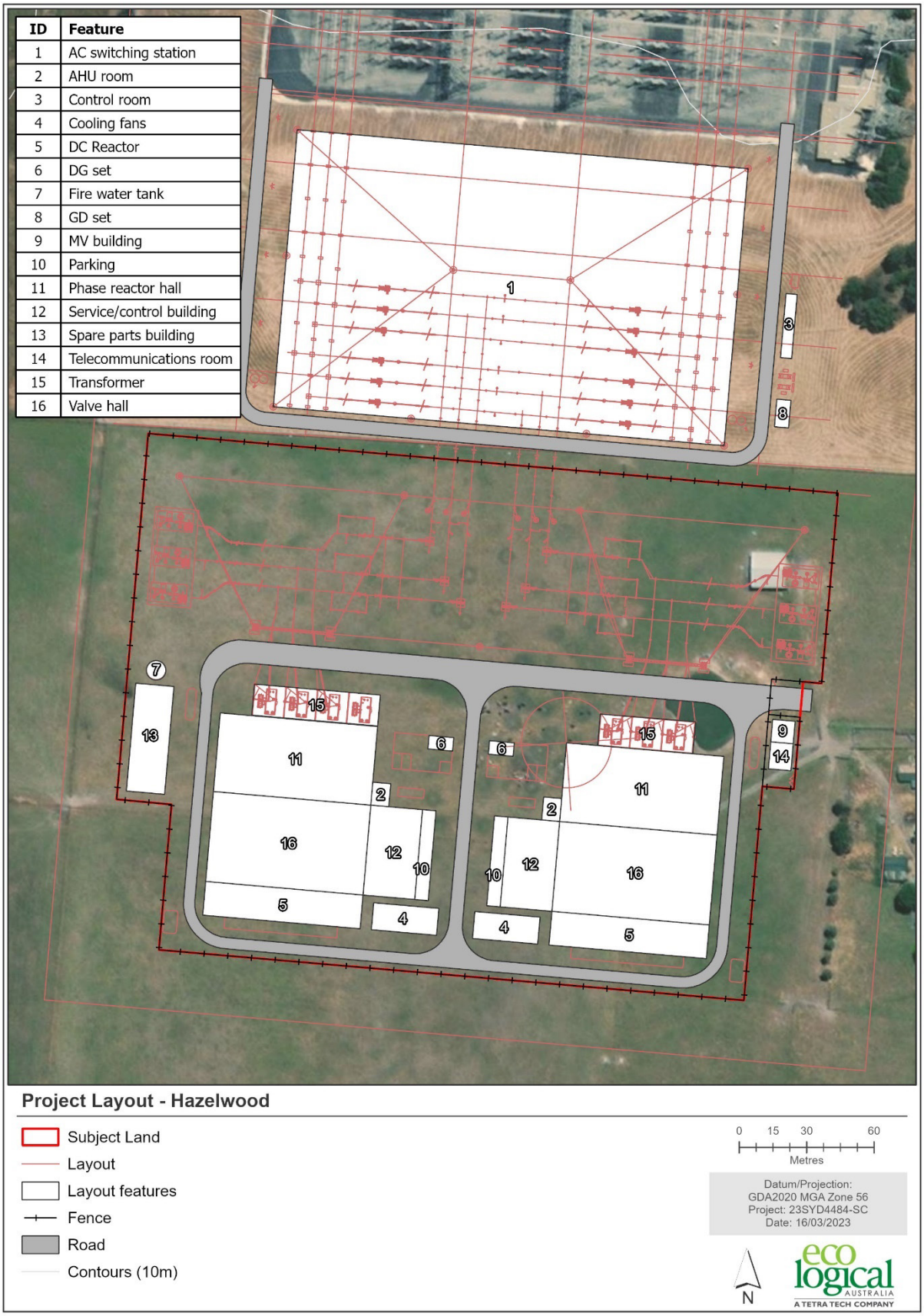


Figure 4: Proposed Layout of the Hazelwood Site

2. Assessment Guidelines

This section outlines the assessment guidelines relevant to bushfire impacts and the linkages to other EIS/EES technical studies. A single consolidated EIS/EES is being prepared to address the requirements of the Commonwealth and Victorian jurisdictions, including the requirement for an EES. This report will use the term EIS/EES going forward.

2.1 Commonwealth

DCCEEW have published the following guidelines for the EIS: '*Guidelines for the Content of a Draft Environmental Impact Statement – Environment Protection and Biodiversity Conservation Act 1999* – Marinus Link underground and subsea electricity interconnector cable (EPBC 2021/9053)'.

The sections of the Commonwealth EIS Guidelines relevant to the bushfire assessment for the project study area include:

- Section 5.1 General Impacts:
    - *In discussing potential impacts, consider how the interaction of extreme environmental events and any related safety response may impact on the environment.*

2.2 Victoria

The EES Scoping Requirements issued by the Minister for Planning (February 2023) outline the specific matters to be assessed across a number of environmental and social disciplines relevant to the project, and to be documented in the EES for the project.

The EES Scoping Requirements inform the scope of the EES technical studies and define the EES evaluation objectives. The EES evaluation objectives identify the desired outcomes to be achieved and provide a framework for an integrated assessment of the environmental effects of a proposed project.

2.2.1 Environment Effects Statement Evaluation Objective

The EES evaluation objective contained in Section 4.5 of the EES scoping requirements that is relevant to this bushfire assessment is:

"*Avoid and, where avoidance is not possible, minimise adverse effects on community amenity, health and safety, with regard to noise, vibration, air quality including dust, the transport network, greenhouse gas emissions, fire risk and electromagnetic fields.*"

2.2.2 Environment Effects Statement Scoping Requirements

The relevant sections of the EES scoping requirements that this assessment has addressed are summarised in Table 1.

Table 1: EES scoping requirements relevant to bushfire assessment

Aspects to be assessed	Scoping Requirements	Report Section***
Key Issues	Implications of the project for fire risk, including from any changes to fire management activities and fire ignition risks arising from the project.	Section 6 and Section 7
Existing Environment	Characterise the fire risks and existing fire management activities in the project area and its surrounds.	Section 6 and Section 7
Likely Effects	Assess the risk of the project causing a fire that affects land and assets. Assess the implications of the project for fire risk management or bushfire suppression activities.	Section 6 and Section 7
Mitigation	Identify measures for avoiding, managing and minimising fire risks arising from the project, having regard to planning and other policy provisions.	Section 7.2 to Section 7.4
Performance	Describe the framework for monitoring and evaluating the measures implemented to mitigate environmental amenity, human health, transport and safety effects and greenhouse gas emissions and contingencies.	Section 7
***-Refers to the report section contained within the EES Scoping Requirements.		

2.2.3 Linkage to Other Reports

This report is informed by or informs the technical studies outlined in Table 2.

Table 2: Linkage of Victoria BIA to Other Reports

Technical study	Relevance to this assessment
Eco Logical Australia-Marinus Link Terrestrial Ecology Impact Assessment 2023. (Technical appendix V: Terrestrial ecology)	Informs the bushfire impact assessment outcome of the northern extent of the project at Hazelwood or Driffield to Waratah Bay as a technical study component of EIS/EES assessment.
Planning and Land Use Impact Assessment (Tetra Tech Coffey 2023). (Technical appendix S: Land use and planning)	Informs existing land uses along the proposed project alignment. This report has assisted in identify land uses, which may be at risk to bushfire and determining potential environmental values related to land use.
Katestone – Marinus Link: Climate and Climate Change Assessment 2023. (Technical appendix C: Climate change)	Informs the bushfire impact assessment outcomes on the project based on key climate issues that have the potential to influence the bushfire risk context.

3. Legislation, Policy and Guidelines

3.1 Victoria

3.1.1 Environment Effects Act 1978

The EE Act requires the preparation of an EES for activities considered to have, or to be capable of having, a significant effect on the environment. Triggers for an EES are set out as referral criteria in the *Ministerial Guidelines for Assessment of Environmental Effects under the* EE Act (DSE 2006).

The purpose of this BIA relating to the EE Act is to identify the specific bushfire effects on the environment from the proposed development and measures to minimise these impacts.

3.1.2 Planning and Environment Act 1987

The PEA Act provides the legislative framework for urban planning instruments and the use and development of land in Victoria. The main instruments that permit urban planning include Victorian Planning Provisions and local planning schemes. These play the role of establishing or amending planning schemes, obtaining planning permits, enforcing compliance, appointment of planning panels and advisory committees, and state significant projects.

The PEA Act addresses all requirements that are needed for a Planning Permit to be issued by the Minister for Planning for renewable energy zone facilities. Any related bushfire conditions identified within a Planning Permit for the proposed development on bushfire prone land must be addressed to mitigate bushfire risk from the site

3.1.3 Planning Schemes Clause 13.02

The Planning Schemes amendments under the PEA Act which influence the project are the South Gippsland and La Trobe City municipalities, both of which consider the implications of bushfire risk.

The primary planning pathways to assess bushfire risk is through Clause 13.02-1S of the Planning Policy Framework and the PEA Act which provides the overarching policy direction with respect to land considered to be a Bushfire Prone Area (BPA) and also land which is affected by the Bushfire Management Overlay (BMO)

Clause 13.02-1S of the Planning Policy Frameworks for Victoria sets out the specific compliance strategies for the protection of human life, which is the overall objective of this Victorian state bushfire policy. The four key strategies that are required to be addressed for facilities located within Bushfire Management Overlay and Bushfire Prone Areas (BPA) include:

- Consideration of bushfire impacts where there is a bushfire hazard;
- Direct proposals to be situated low risk locations;
- Assess and apply bushfire protection measures; and
- No increased risk and risk reduction where applicable.

Given the project is not identified as an accommodation or assembly building no BMO construction requirement apply. However Clause 13.02-1S provides guidance to assess whether the development is an appropriate land use within BPA. This BIA aims to ensure that the proposed development is suitably

situated in a low risk fire environmental; is appropriately supported by EPRs; and does not contribute to an increased level of fire risk to life, property, and the environment.

Further details of the BIA method undertaken are provided in Section 5. Section 6 then presents the bushfire risk context of the sites, followed by Section 7, which assesses the impacts and outlines appropriate environmental performance requirements to drive risk avoidance or mitigation.

4. Project Description

This section discusses the key component and details of the project description and activities that are relevant to the BIA.

4.1 Overview

Marinus Link is proposed to be implemented as two 750 MW circuits to meet transmission network operation requirements in Tasmania and Victoria. Each 750 MW circuit will comprise two power cables and a fibre-optic communications cable bundled together in Bass Strait and laid in a horizontal arrangement on land. The two 750 MW circuits would be installed in two stages with the western circuit being laid first as part of stage one, and the eastern cable in stage two.

The key project components for each 750 MW circuit, from south to north, are:

- HVAC switching station and HVAC-HVDC converter station at Heybridge in Tasmania. This is where the project will connect to the North West Tasmania transmission network being augmented and upgraded by the North West Transmission Developments (NWTD)Shore crossing in Tasmania adjacent to the converter station.
- Subsea cable across Bass Strait from Heybridge in Tasmania to Waratah Bay in Victoria.
- Shore crossing at Waratah Bay approximately 3 km west of Sandy Point.
- Land-sea cable joint where the subsea cables will connect to the land cables in Victoria.
- Land cables in Victoria from the land-sea joint to the converter station site in the Driffield or Hazelwood areas.
- HVAC switching station and HVAC-HVDC converter station at Driffield or at Hazelwood, where the project will connect to the existing Victorian transmission network.

A transition station at Waratah Bay may also be required if there are different cable manufactures or substantially different cable technologies adopted for the land and subsea cables. The location of the transition station will also house the fibre optic terminal station in Victoria. However, regardless of whether a transition station is needed, a fibre optic terminal station will still be required in the same location. The key project components are shown in Diagram 1.

Approximately 255 kilometres (km) of subsea HVDC cable will be laid across Bass Strait. The preferred technology for Marinus Link is two 750 megawatt (MW) symmetrical monopoles using ±320 kV, cross-linked polyethylene insulated cables and voltage source converter technology. Each symmetrical monopole is proposed to comprise two identical size power cables and a fibre-optic communications cable bundled together. The cable bundles for each circuit will transition from approximately 300 m apart at the HDD (offshore) exit to 2 km apart in offshore waters.

In Victoria, the shore crossing is proposed to be located at Waratah Bay with the project alignment crossing at the Waratah Bay–Shallow Inlet Coastal Reserve. From the land-sea joint located behind the coastal dunes, the land cable will extend underground for approximately 90 km to the converter station. From Waratah Bay the cable will run northwest to the Tarwin River Valley and then travel to the north

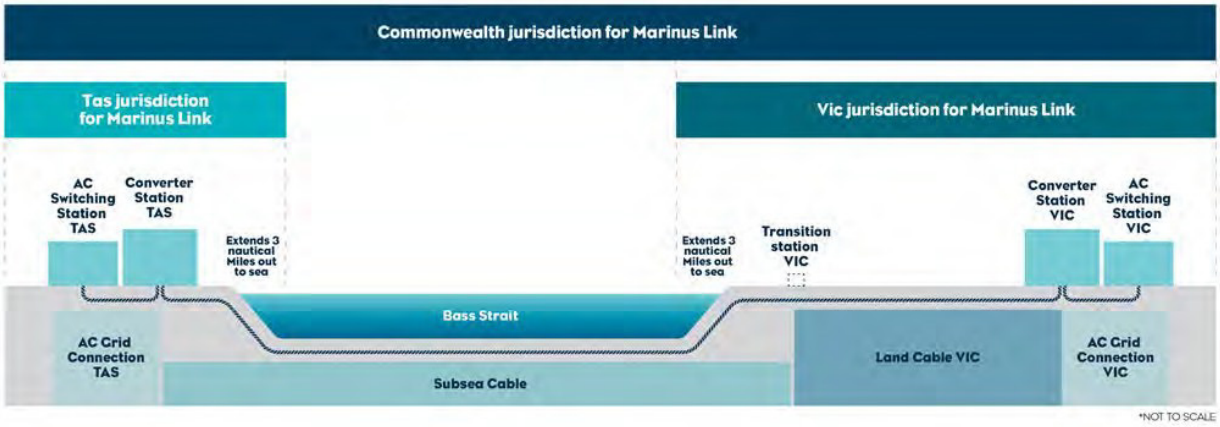
to the Strzelecki Ranges. The project alignment crosses the ranges between Dumbalk and Mirboo North before descending to the Latrobe Valley where it turns northeast to Hazelwood. The Victorian converter station will be at either a site south of Driffield or Hazelwood adjacent to the existing terminal station.

The land cables will be directly laid in trenches or installed in conduits in the trenches. A construction area of 20 to 36 m wide would be required for laying the land cables and construction of joint bays. Temporary roads for accessing the construction area and temporary laydown areas will also be required to support construction. Where possible, existing roads and tracks will be used for access, for example, farm access tracks or plantation forestry tracks.

Land cables will be installed in ducts under major roads, railways, major watercourses and substantial patches of native vegetation using trenchless construction methods (e.g., HDD), where geotechnical conditions permit. A larger area than the 36 m construction area will be required for the HDD crossings.

The BIA is focused on the Victorian section of the project. This report will inform the EIS/EES being prepared to assess the project's potential environmental effects in accordance with the legislative requirements of the Commonwealth and Victorian governments (Diagram 1).

Diagram 1: Project components considered under applicable jurisdictions (Marius Link Pty. Ltd. 2022, Consultation Plan).



Marinus Link is proposed to be constructed in two stages over approximately five years following the award of works contracts to construct the project. On this basis, stage 1 of the project is expected to be operational by 2030, with Stage 2 to follow, with final timing to be determined by market demand. The project will be designed for an operational life of at least 40 years.

4.2 Construction

The project will be constructed in two 750 MW stages, each stage will have three cables bundled together in Bass Strait and laid in a single trench on land. For the land cables, the trench conduits and HDD ducts for both 750 MW links will be installed as part of stage one to reduce disturbance to properties, land use and farming activities.

Stage one will involve site establishment and hardstand areas constructed for the HVDC converter station, HVAC switching station and transition station sites. It will also involve all site establishment, civil works, trenching and installation of conduits, and installation of cable joint pits for the two cables. The land and subsea cables will be laid in each stage. This is to ensure that the cable barge is available for any rehabilitation activities that are required throughout the cable testing phase in Stage two.

The works in stage two will primarily be construction of the second HVDC Converter, laying of the land based and the second subsea cable, completing the testing and commissioning, and any remaining site rehabilitation.

The key construction activities for land cables are:

- Establishing laydown areas, site offices and amenities.
- Site establishment e.g. constructing site entries and gates, access roads and tracks to the construction corridor, weed and pathogen wash-down facilities, and stock proof fencing, where required and agreed with landowner / land manager.
- Topsoil stripping and stockpiling.
- Constructing haul roads along the construction working corridor.
- HDD and duct installation at road, watercourse and third-party infrastructure crossings.
- Excavation of trenches and stockpiling of subsoil separate from topsoil.
- Installation of conduits and thermal backfill. Imported thermal backfill will be required where the native soil does not have the required heat dissipating properties.
- Backfilling trenches with subsoil and topsoil to reinstate soil horizons and reinstatement of the construction corridor except at cable joint pits and where equipment (e.g., caterpillar) required to assist cable installation, e.g., at bends and HDD crossings.
- Construction (in-situ) or installation (pre-cast modules) of cable joint pits.
- Pulling of land cables through the conduits between adjacent cable joint pits.
- Cable jointing.
- Backfilling and reinstatement of cable joint pit workspaces.

It is intended that the Victorian shore crossing will be constructed using HDD to approximately 10 m water depth. The subsea cables will be installed in ducts inserted into the HDD boreholes. Up to 1 ha is required for the HDD drill pad, which will be located as close to the coastal reserve as possible (without being within the coastal reserve). The HDDs are expected to be between 800 m and 1,200 m long. Three boreholes will be required for each circuit, one for each power cable and one for the fibre-optic cable.

HDD from farmland adjacent to the coastal reserve is expected to be feasible for the Victorian shore crossing at Waratah Bay. The Waratah Bay foreshore will not be closed during construction, unless required to manage public safety concerns at the time, in which case disruption will be short term and temporary.

Approximately 12 months of drilling will be required to construct both circuits.

4.3 Operation

The project will operate 24 hours per day, 365 days per year over an anticipated minimum 40-year operational lifespan.

Operation and maintenance activities include:

- Routine inspections of the land cable easement for potential operational and maintenance issues, including:
    - Unauthorised activities and structures.
    - Land stability.
    - Rehabilitation issues.
    - Weed infestations resulting from construction activities.
    - Cover at watercourse crossings.
- Periodic inspection of the subsea cable alignments by remotely operated vehicles.
- Remote monitoring of shipping activity near the subsea cables for potential anchoring issues.
- Servicing, testing and repair of the subsea and land cables, transition station and converter stations equipment and infrastructure including scheduled minor and major outages.
- Maintenance of access tracks.

4.4 Decommissioning

Decommissioning will be planned and carried out in accordance with regulatory and landowner or land manager requirements at the time. A decommissioning plan in accordance with approvals conditions will be prepared prior to planned end of service and decommissioning of the project.

Requirements at the time will determine the scope of decommissioning activities and impacts. The key objective of decommissioning is to leave a safe, stable and non-polluting environment, and minimise impacts during the removal of infrastructure.

In the event that the project is decommissioned, all above-ground infrastructure will be removed, and associated land returned to the previous land use or as agreed with the landowner or land manager.

Decommissioning activities required to meet the objective will include, as a minimum, removal of above ground buildings and structures. Remediation of any contamination and reinstatement and rehabilitation of the site will be undertaken to provide a self-supporting landform suitable for the end land use.

Decommissioning and demolition of project infrastructure will implement the waste management hierarchy principles being avoid, minimise, reuse, recycle and appropriately dispose. Waste management will accord with applicable legislation at the time.

Decommissioning activities may include recovery of land and subsea cables and removal of land cable joint pits. Recovery of land cables would involve opening the cable joint pits and pulling the land cables out of the conduits, spoiling them onto cable drums and transporting them to metal recyclers for recovery of component materials. The conduits and shore crossing ducts would be left in-situ as removal would cause significant environmental impact.

The concrete cable joint pits would be broken down to at least one metre below ground level and buried in-situ or excavated and removed. Subsea cables would be recovered by water jetting or removal of rock mattresses or armouring to free the cables from the seabed.

A decommissioning plan will be prepared to outline how activities will be undertaken and potential impacts managed.

5. Assessment Method

This section describes the method used to assess the potential bushfire impacts associated with the project activities, considering the values present within the project area. This assessment method addresses the requirements outlined in the Commonwealth EIS and Victorian EES assessment guidelines for the project (section 2).

5.1 Study Area

The study area is defined as the total area needed to be able to sufficiently characterise and assess bushfire impacts to the existing environmental and social values, within a suitable level of spatial context.

The three study areas for the Victorian BIA report are Driffield, Hazelwood, and Waratah Bay. For each study area two levels of bushfire assessment analysis are undertaken, being:

- **Bushfire Hazard Assessment** – assessment of bushfire fuels (vegetation) and topography at a local scale within a 500m buffer of each of the study areas; and

- **Bushfire Risk Assessment** - assessment of the bushfire hazard in combination with fire history, fire weather, fire behaviour potential, fire paths, and assets at risk at a semi-landscape level within a 5km buffer of each of the study areas.

In addition to the three study areas above, the proposed underground cabling route for the project between Hazelwood and Waratah Bay has been considered as a temporary mobile study area as some works with ignition potential (e.g. hot works) may be undertaken. This temporary and mobile study area is applicable to the construction stage only. Given this mobile study area crosses a varying landscape of low bushfire hazard (e.g. agricultural lands) and high bushfire hazard (e.g. pine plantations) areas, the impact assessment and assigned EPR's covered further in this report have been considered consistent with a high bushfire hazard site (e.g. Driffield).

5.2 Baseline Characterisation

The baseline characterisation has involved a critical review of both bushfire risk and management practices across the project area and surrounds via a desktop assessment of available documentation and GIS analysis of Victorian and Commonwealth databases.

A spatial analysis and mapping exercise has been undertaken of identified bushfire hazards, potential bushfire spread, and establishing a risk context for the study sites as it relates to the project. Spatial datasets used in this desktop analysis include slope, elevation, vegetation, land use, fire history, and project site layouts as provided by MLPL.

5.3 Risk and Impact Assessment

The method of impact assessment adopted for this study is based on a risk assessment approach of likelihood and consequence with regard to potential impacts on life, property and environmental values.

The methodology adopts AS/NZS 31000:2018 'Risk management – Principles and guidelines' whereby a risk classification scheme is developed through qualitative scales of likelihood and of consequence.

The impact assessment adopted a risk assessment approach. This involved establishing the bushfire risk context to identify values, identification of the hazard, consequence of an event, and the likelihood of impact on values arising from bushfire attack both to and from the project study sites.

The methodology adopted aligns with that in AS/NZS 31000:2018 'Risk Management – Principles and Guidelines' whereby a risk classification scheme is developed through qualitative scales of likelihood and of consequence.

This assessment adopted a definition of likelihood based on likelihood of occurrence over the life of the project. The scale of likelihood is shown below and is based on AS/NZS ISO 31000. Values have been allocated to the likelihood descriptors on a scale of 1 to 5 with 1 being extremely rare (extremely unlikely) and 5 being almost certain, as outlined in Table 3 below.

Table 3: Likelihood Description

Likelihood Descriptor	Description
Almost certain (5)	The event is expected to occur in most circumstances during the currency of the project.
Likely (4)	The event will probably occur in most circumstances during the currency of the project.
Possibly (3)	The event might occur at some time over the currency of the project.
Unlikely (2)	The event could occur at some time over the currency of the project.
Rare (1)	The event may occur only in exceptional circumstances over the currency of the project.

The scale of consequence is shown in Table 4 below and is based on AS/NZS ISO 31000. Values have been allocated to the consequence descriptors on a scale of 1 to 5 as outlined below and are based on the most probable outcome of a fire event(s).

Table 4: Consequence Description

Consequence Descriptor	Description
Catastrophic (5)	Death, huge financial loss, irreversible widespread environmental damage
Major (4)	Extensive injury, major financial loss, irreversible local environmental damage
High (3)	Medical treatment, high financial loss, Long-term environmental damage
Medium (2)	First aid, medium financial loss, Short-term environmental damage
Low (1)	No injuries, low financial loss, minor environmental impact

Rating codes and the level of risk are then calculated by multiplying likelihood and consequence levels with the rating determined as shown in the risk matrix outlined in Table 5 and Table 6 below.

Table 5: Risk Matrix Rating

		Likelihood				
		Rare (1)	Unlikely (2)	Possible (3)	Likely (4)	Almost certain (5)
Consequence	Low (1)	Insignificant	Insignificant	Insignificant	Insignificant	Minor
	Medium (2)	Insignificant	Insignificant	Minor	Minor	Moderate
	High (3)	Insignificant	Minor	Minor	Moderate	Major
	Major (4)	Insignificant	Minor	Moderate	Major	Extreme
	Catastrophic (5)	Minor	Moderate	Major	Extreme	Extreme

Source: Adapted from AS-ISW-3100:2018

Table 6 Level of risk

Level of risk	Risk rating
0 - 4	Insignificant
5 - 9	Minor
10 - 14	Moderate
15 - 19	Major
20 - 25	Extreme

The risk assessment was compiled with consideration of various risk factors and the baseline conditions. Table 7 below provides an analysis of the risk factors. The risk factors presented are taken into careful consideration when assigning likelihood and consequence values to determine of overall risk impact. Also, in the application of risk assessment impacts to life and property for the three site, key vulnerability criteria are also assigned and assessed in conjunction with likelihood and consequence factors. Assigned vulnerability criteria are specified below in Tables 8 to 11, 13 to 16, and 18 to 21.

The vulnerability criteria applied in consideration of the bushfire impact assessment (BIA) in Section 7 have been developed with particular emphasis on risk to both **life** and to **property assets** over each of the three project phases (construction, operation, and decommissioning) and the project locations (Driffield, Hazelwood, Waratah Bay, and the cabling route).

The vulnerability criteria have been developed and assigned by ELA in this BIA based on the process outlined in AS ISO 31000:2018. This includes defining risk criteria to be consistent with the risk management framework and customized for the specific purpose of this BIA.

The vulnerability criteria that have been applied to **life** are:

- *Populated area where the combination of threat and vulnerability exposes a community to a significant likelihood of fatalities and major injuries.*
- *Less likely to be fatalities or major injuries due to the presence of attributes which afford some protection.*
- *Loss of life or major injury highly unlikely. Medical / hospital treatment may be required.*
- *Minor injuries only-first aid treatment. No major injuries or fatalities likely.*
- *No injuries or fatalities likely.*

These vulnerability criteria have been applied to each of the subject sites, where a fire starts and spreads over a large area on an elevated fire danger day within the landscape. Landscape factors considered included fuel type and continuity, terrain/topography, fire history, land use, and opportunities for fire detection and suppression.

On this basis an assessment of the each of the vulnerability criteria to human life was determined on a scale ranging from 'fatalities' and 'major injuries' through to 'no injuries or fatalities' taking into consideration each of the consequence and likelihood ratings.

Having considered each of the life vulnerability criteria an initial risk rating was then assigned to each being the product of the consequence and likelihood ratings.

The vulnerability criteria that have been applied to **property assets** are:

- *Extensive and widespread loss of property. Major impact across a large part of the community and region. Long term external assistance required to recover.*
- *Localised damage to property. Short-term external assistance required to recover.*
- *Short-term damage to individual assets. No external assistance required to recover.*
- *Inconsequential or no damage to property. Little or no disruptions to the community.*

Similar to the life vulnerability criteria, the property assets vulnerability criteria were applied to each of the subject sites, where a fire starts and spreads over a large area on an elevated fire danger day within the landscape. Landscape factors considered included fuel type and continuity terrain/topography, fire history, land use, and opportunities for fire detection and suppression.

On this basis an assessment of each of the vulnerability criteria to property assets was determined on a scale ranging from 'extensive and widespread loss of property' through to 'inconsequential or no damage to property' taking into consideration each of the consequence and likelihood ratings.

Having considered each of the property assets vulnerability criteria an initial risk rating was then assigned to each being the product of the consequence and likelihood ratings.

The risk assessments presented below in Table 8 to Table 21 at each of the construction, operational, and decommissioning stages to threats to life and property vary from insignificant to minor risk.

Table 7: Analysis of Risk Factors.

Risk Factor	Analysis of Risk Factor
1. The likelihood of human and natural fire ignitions, as influenced by time, space and demographics.	Natural ignitions adjoining each of the project area sites from events such as lightning strikes are possible but not likely given fuel types, fire weather and low incidence of recorded fire history (Waratah Bay and Hazelwood). Human activities within the subject sites make ignitions more likely from activities associated with construction, operation/maintenance and decommissioning, including machinery use, hot works (e.g. grinding, welding) and other activities with potential for fire ignition.
2. The potential spread and severity of a bushfire, as determined by fuel, topography and weather conditions.	Weather conditions, fuel and slope are key factors that can be the primary determinants of the potential for and direction of fire spread. The relatively flat to undulating slopes, low grassland hazard and agricultural grazing practices (that reduce fuel) proximal to the Waratah Bay and Hazelwood sites, along with potential impedances to spread (i.e. fuel discontinuity, roads etc) provide reduced opportunities for fire development and progression. Further, the likelihood of elevated fire behaviour and fire spread for the

Risk Factor	Analysis of Risk Factor
	Waratah Bay site is expected to be lessened due to maritime weather influences, which effect the curing of grassland fuels. This would also apply to the cable route, especially in areas adjoining Waratah Bay, diminishing with distance from the coast. The forest vegetation formations (pine plantations) of the Driffield site is considered to provide a higher fuel hazard on flat to undulating terrain. The area is (on occasions) exposed to primary bushfire weather of hot, dry and strong southwest and north to north-westerly winds. Future thinning and harvesting of surrounding pine compartments over time presents temporal opportunities for reduced fuel continuity and fire progression.
3. The proximity of assets vulnerable to bushfire and likely bushfire paths.	The project sites of Waratah Bay, Driffield, and Hazelwood have vulnerable assets within and proximal offsite, as listed in Section 6.2 above. Bushfires have the potential to spread from any direction but more likely from the west to north-west aspects and impact onsite and offsite assets.
4. The vulnerability of assets, or their capacity to cope with, and recover from bushfire.	On-site electrical infrastructure assets can incorporate measures to withstand bushfire attack and reduce vulnerability. The offsite assets in proximity to the sites as listed in Section 6.2 above are considered vulnerable to fire but have capacity to cope with short to medium term recovery possible.

5.4 Assumptions and Limitations

For the assessment of study sites undertaken, the following assumptions and limitations are recognised:

- The BIA is a desktop analysis utilising all available relevant GIS data available from State and Commonwealth data bases. A desktop assessment is considered sufficient for assessing the risk of bushfire in the region where the project is proposed.
- The residual risk of bushfire impacts is assumed to be attained whereby all recommended EPR are effectively implemented at the construction, operational, and decommissioning stages till project termination.

6. Existing conditions

This section describes the baseline characterisation of existing features and aspects relevant to the BIA.

6.1 Hazards and Risks

This baseline characterisation seeks to identify the assets that are potentially at risk from various fire ignition sources related to the proposed development, the potential bushfire hazards, and the factors that contribute to affecting the overall risk exposure.

Fire sources for consideration include bushfires impacting on the subject sites as well as fires originating from within the sites caused by anthropogenic sources such as smoking, machinery, vehicles, equipment (e.g. welders, grinders), electrical infrastructure, liquid fuels, and other combustible materials.

Factors that affect the level of risk exposure include climate, fuel hazards, topography, fire behaviour potential, fire ignition factors, potential fire spread and fire history. These factors are explored further in following sections.

The perceived worst case bushfire scenarios have been considered for the purpose of understanding the level of bushfire risk exposure. They assume bushfire risk EPRs have been implemented for the development.

Note 1 - For both the Hazelwood and Waratah Bay sites these have been amalgamated into the one bushfire risk scenario recognising both sites from a risk context are grassland hazards located within an agricultural landscape; have a low incidence of recorded fire history and fire ignitions; and have increased opportunities for fire suppression.

Note 2-It should be noted as covered in Section 5.1 that the entire terrestrial HVDC trenching cabling stage of the project (being a temporary mobile site during the construction phase only) is classified within a high hazard site and assessed in conjunction with the Driffield site bushfire risk scenario below. This scenario applies to all cabling construction undertaken west of the Hazelwood converter station site to the Driffield converter station site, then south to southwest to the Waratah Bay transition station site. Risk of fire propagation from this temporary site is largely attributed to hot works activities, machinery, and other human induced ignitions associated with the construction phase.

The risk scenarios considered in this assessment include:

Hazelwood and Waratah Bay Sites

1. A large landscape grassfire **starts outside of the project sites** to the northwest with winds from the northwest, within un-grazed paddocks surrounding the development area in a fully cured state. The fire progresses further southeast and the head fire impacts on the site electrical infrastructure. The likelihood of such a fire occurrence is low, given the low incidence of wildfire history, generally modified/reduced grassland fuels from agricultural practices, not cured or non-curing fuels, and interruptions in fuel continuity. However, it is still possible given the fire weather and fire behaviour potential, with a substantial or complete fire encroachment on all electrical infrastructure is possible but not likely.

2. An electrical fault ignites unmanaged grass (greater than 100 mm in height) **with the sites** under electrical infrastructure on a day, with a westly wind direction and at a time when grassland fuels within the development site as well as grazing land adjacent to study sites are fully cured. The fire spreads to the east impacting on established rural residential properties, crops, stock, and fences. As for the first scenario, the likelihood of such a fire is low.

The risk of a major fire spreading from the Hazelwood and Waratah Bay study sites is very low, based on the low likelihood of ignition, good suppression opportunities, impedances to fire development and spread (i.e. fuel breaks and reduced fuel areas). Despite the low likelihood of bushfire impact, the risk still warrants mitigation particularly through the management of potential fire ignitions from these sites to protect surrounding assets (life, property, and the environment).

Driffield Site and Cabling Route

1. A large landscape forest fire **starts outside** of the project site to the northwest with winds from the northwest, with pine plantations surrounding the study site with low fuel moisture content and no previous plantation thinning. The fire progresses further southeast and the head fire impacts on the site electrical infrastructure. The likelihood of such a fire occurrence is higher, given the increased incidence of wildfire history of the project area, and continuous plantation fuels. However, it is still possible given the fire weather and fire behaviour potential, with a substantial or complete fire encroachment on all site electrical infrastructure is possible.
2. An electrical fault ignites unmanaged plantation forest fuels **directly adjoining the site** electrical infrastructure with a westly wind direction and at a time when pine plantation forest fuels within the development site having low moisture contents. The fire spreads to the east impacting on established pine plantations, rural residential dwellings, crops, stock, and fences. As for the first scenario, the likelihood of such a fire is higher.

The risk of a major fire spreading from the Driffield study site or Cable Route is higher, based on the higher likelihood of ignition fire history, reduced detection and access opportunities by fire services. Given the higher likelihood of bushfire impact, the risk still warrants mitigation.

6.2 Assets at Risk

The following assets for each of the study sites at Waratah Bay, Driffield and Hazelwood, are located on site or surrounding the proposed development and could be at risk from bushfire:

- **Waratah Bay Site:**
  - 320kV HVDC Transition Station
  - Station security fencing and gates
  - Laydown areas
  - Modified grazing pastures
  - Stock (sheep and cattle)
  - Boundary fences
  - Scattered rural residences, sheds and other farming infrastructure
  - Townships of Waratah Bay, Sandy Point and Walkerville
  - Waratah Beach Camp
- **Driffield Site:**
  - Converter Stations 1 and 2
  - AC Switching Station

  - Site security fencing and gates
  - Spare parts building and fire water tank
  - Service Control Building
  - Telecommunications Room
  - MV Building
  - Construction Hardstand Area
  - 500 KV transmission lines
  - Commercial pine plantations
  - Modified grazing pastures
  - Stock (sheep and cattle)
  - Boundary fences
  - Scattered rural residences, sheds and other farming infrastructure
  - Townships of Driffield, Hazelwood, and Yinnar
  - Larger settlement of Churchill
  - Martin Walker Reserve
  - Morwell Open Cut Mine
- **Hazelwood Site:**
  - Converter Stations 1 and 2
  - AC Switching Station
  - Site security fencing and gates
  - Construction Hardstand Area
  - Spare parts building and fire water tank
  - Control building
  - Telecommunication room
  - MV building
  - 500 KV transmission lines
  - Modified grazing pastures
  - Stock (sheep and cattle)
  - Boundary fences
  - Scattered rural residences, sheds and other farming infrastructure
  - Jeeralong A and B Power Station
  - Hazelwood Terminal Station
  - Larger settlements of Churchill and Hazelwood (North and South)
  - Jeeralang Traralgon Plantations

All of these assets could potentially be at risk from a bushfire that may propagate from within each of the three sites, or from an external fire threat.

6.3 Fire Fighter and Public Safety

The uses of the general area surrounding each of the three sites is mostly limited to local landowners, who are generally farmers undertaking agricultural activities; or forestry plantation management practitioners (Driffield). There will be no public access permitted to each of the study sites.

All study sites are in rural localities which are sparsely occupied and as such, the risk to public safety offsite in surrounding areas is negated by a low baseline of bushfire risk activities.

The fire-fighters likely to respond to a bushfire within each of the sites would be as follows:

- Waratah Bay Site - the CFA Fire Stations located at Walkerville and Sandy Point;
- Driffield Site - the CFA Fire Stations located at Thorpdale, Yarragon and Morwell; and
- Hazelwood Site - the CFA Fire Stations located at Churchill, Hazelwood North, and Morwell.

The bushfire risks to fire-fighter safety when attending a fire in grassland and / or forest fuels applies both on and off each of the sites respectively including exposure to smoke, embers, radiant heat, and direct flame contact.

The risks to fire-fighter safety associated with a fire burning within each of the sites are:

- Electrocution from physical contact with energised electrical infrastructure or from conduction through air, water or materials in contact with the infrastructure; and
- Inhalation of potentially toxic fumes and smoke from any plastic or rubber components such as cables or other building / structure components on site involved in fire.

6.4 Fire Ignition Risks

The main potential sources of fire ignition in off-site locations to potentially impact on each of the sites include harvesting operations, farm machinery, lightning strikes, escape from legal and illegal burning operations, and other anthropogenic causes (arson, cigarettes, motor vehicle accidents, slashing machinery, earthmoving plant, angle grinders, and welders).

Construction and maintenance activities at each of the sites and operational use of the onsite infrastructure and decommissioning activities could also present potential sources of ignition from each of the sites (being the primary focus of the BIA), including:

- Fires as a result of electrical or mechanical faults;
- The use of or inappropriate storage of flammable fuels;
- Utilisation of machinery and equipment;
- Land management activities (e.g. fire break maintenance, vegetation management);
- Construction or maintenance activities (e.g. welding, grinding and other ignition generating works); and
- Other anthropogenic sources (e.g. from discarded cigarette butts, cooking fires, fire starts from vehicles or accidents, arson etc.).

6.5 Bushfire Risk Factors

6.5.1 Fire Weather and Climate

Fire weather strongly influences the likelihood of ignition and how often fires that are ignited will be uncontrollable. The bushfire season is declared annually by the CFA Chief Officer and generally commences on the 1st October and concludes on the 31st March the following year, however these dates can be modified depending on the season and conditions.

The Gippsland region which covers the study sites experiences mild to warm summers with average maximum temperatures of 21 to 25°C and with winter months near the coast with average maximum temperatures of 12 to 15°C. Rainfall is variable, with the southern portion of the Great Dividing Range, the Strzelecki Ranges and the southwestern and eastern parts of region receiving rainfall amounts of 1000mm to over 1600mm, but tending to decrease to less than 600mm in central parts of the region

(BOM 2022). The greatest potential for bushfire events is associated with the bushfire season which coincides with strong north to north-west and south-west winds, together with low rainfall and drought conditions.

Fire weather is generally considered in terms of fire behaviour and reported as a Fire Danger Rating (FDR). The new Australian Fire Danger Rating System adopted on the 1st September 2022 calculates, forecasts and reports fire danger using up-to-date fuel state data, spatial and satellite data, weather data, science, and technology (AFAC 2022). It uses decades of research incorporated into eight fire behaviour models to calculate the Fire Behaviour Index (FBI) which adopts values between 0 to 100. The FBI is used to identify potential fire behaviour in finer detail and assist in better decision making within the four Fire Danger Ratings. The higher the FBI the more dangerous the fire behaviour and therefore fire danger risk. The four FDR categories are displayed in Diagram 2. Forecast FDR are determined by the Bureau of Meteorology (http://www.bom.gov.au/vic/forecasts/fire-danger-ratings.shtml) and are displayed by FDR signs, typically near roadsides.

Diagram 2: Fire Danger Ratings

6.5.2 Fuel Hazard

6.5.2.1 Waratah Bay

The area within and surrounding the Waratah Bay site is largely used for agricultural purposes (Figure 5). The fuel hazard around the site is predominately grassland (Figure 6). Much of the grasslands adjoining the site are also kept in a fuel reduced state by cropping and grazing activities, which somewhat mitigates the fire risk to and from this site.

6.5.2.2 Driffield

The area within and surrounding the Driffield site is largely used for timber pine plantations (Figure 7). The fuel hazard within and around the site is therefore predominately forest (Figure 8). The forest fuel hazard surrounding the site, although presenting larger available fuel loads than grassland, the plantations would be subject to future regimes of thinning and/or harvesting operations, thus modifying spatial fuel arrangement and continuity over time.

6.5.2.3 Hazelwood

The area within and surrounding the Hazelwood site is largely used for agricultural purposes (Figure 9). The fuel hazard around the site is therefore predominately grassland (Figure 10). Much of the grasslands adjoining the site are also kept in a fuel reduced state by cropping and grazing activities, which somewhat mitigates the fire risk to and from this site. The subject site also directly adjoins the existing Hazelwood substation, located along the northern boundary of the site. This moderates the fuel hazard in this location. In addition, there are a number of areas of intensive agricultural uses within this locality which moderates the fuel hazard and influences the potential fire runs.

All land uses depicted in Figure 9 have been sourced from the current available Victorian GIS datasets (Department of Economic Development, Jobs, Transport, and Resources 2017). It is noted that this dataset provides a state level classification, which generalises the portrayal for some land uses. For example, Hazelwood coal mine is mapped by this dataset as part intensive uses, part agricultural uses. Despite the limitations of the state level dataset, it aided initial assessment of the land use and hazard types proximal to the subject site and was then combined with further desktop assessment. Thus the influence on bushfire risk for the site from all proximal land uses and hazard types has been considered in the assessment.

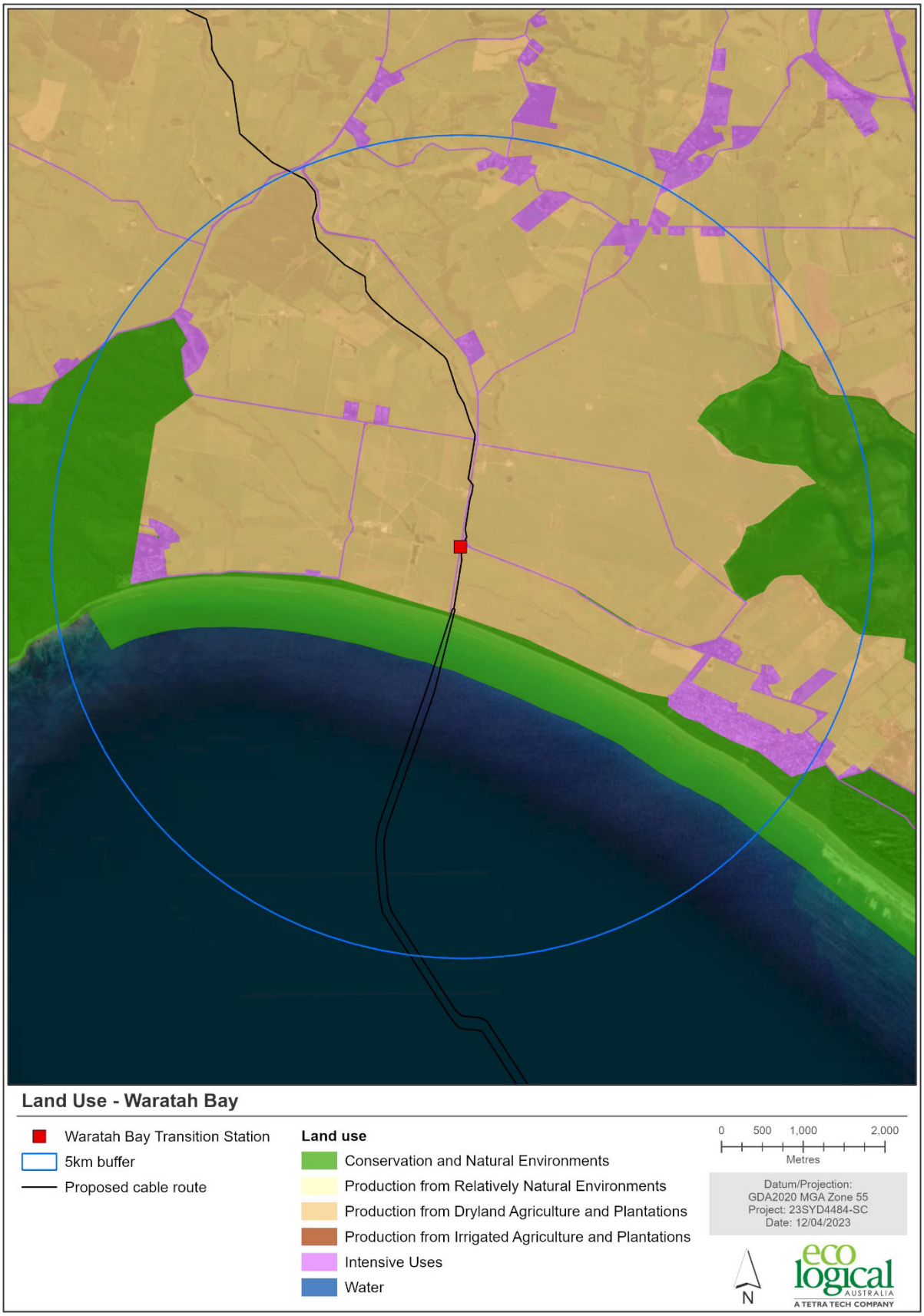


Figure 5: Land Use Waratah Bay Site (Department of Economic Development, Jobs, Transport, and Resources 2017)

Figure 6: Bushfire Hazard Assessment Waratah Bay Site

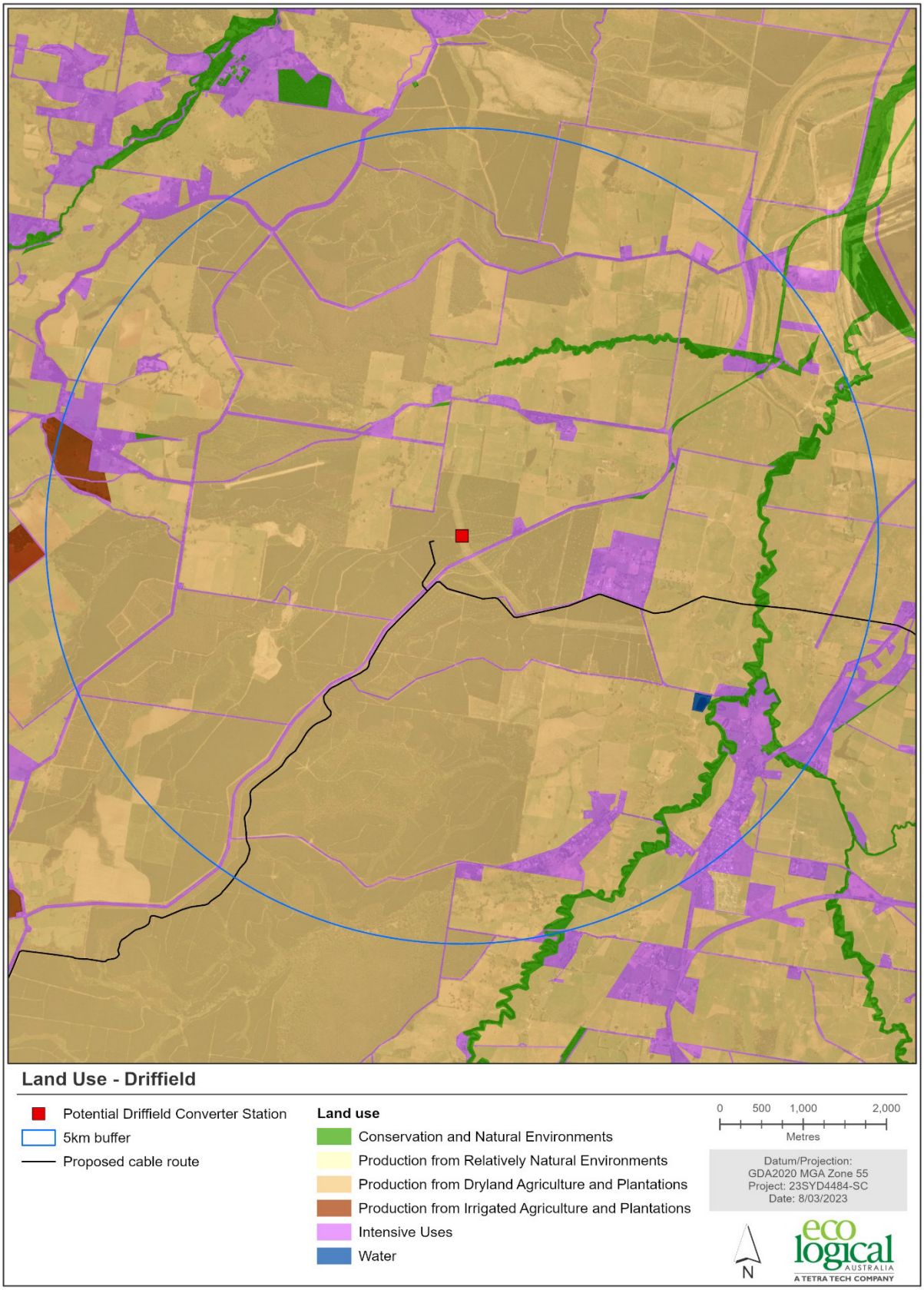


Figure 7: Land Use Driffield Site(Department of Economic Development, Jobs, Transport, and Resources 2017)

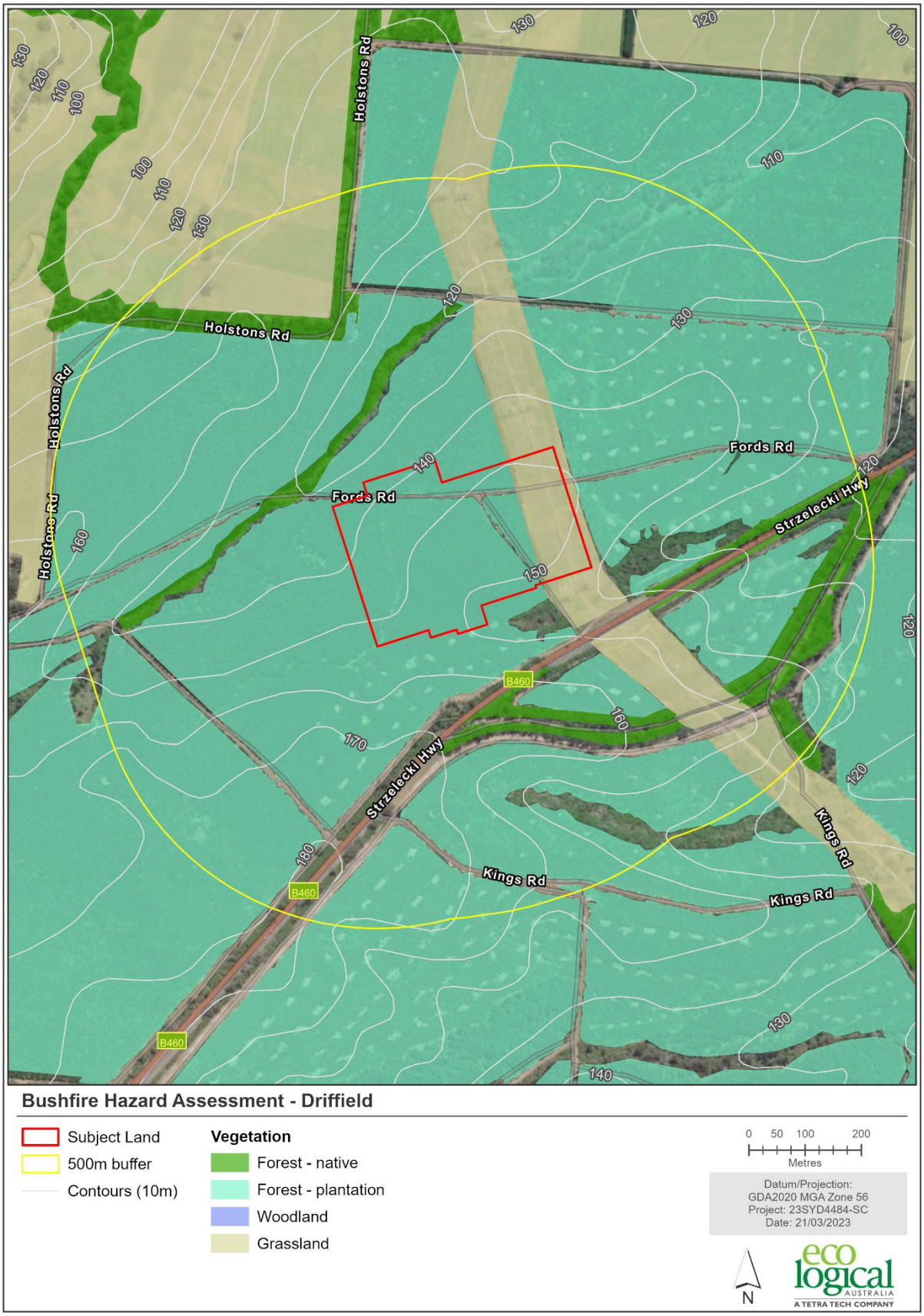


Figure 8: Bushfire Hazard Assessment Driffield Site

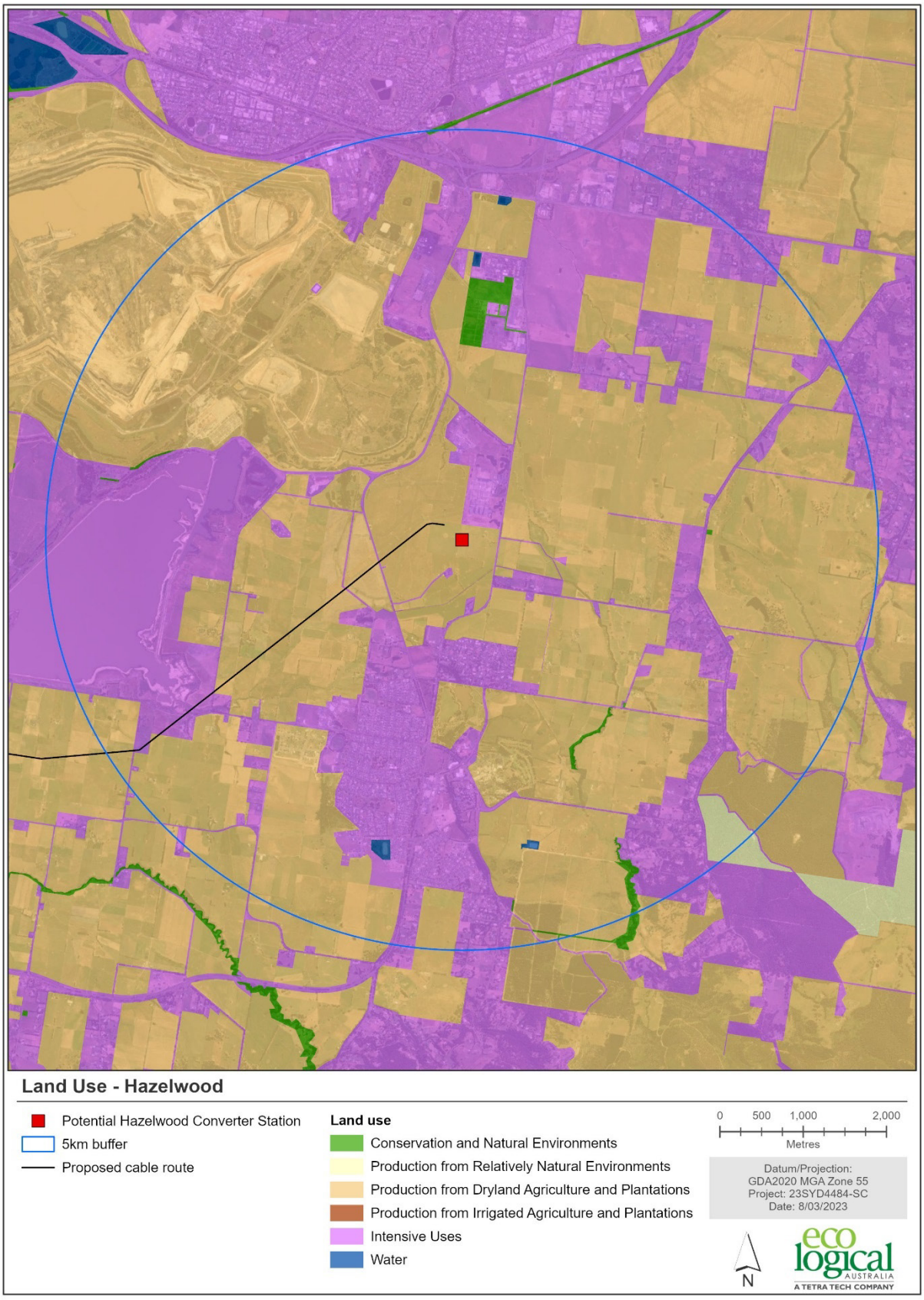


Figure 9: Land Use Hazelwood Site (Department of Economic Development, Jobs, Transport, and Resources 2017)

Figure 10: Bushfire Hazard Assessment Hazelwood Site

6.5.3 Topography

The topography of the landscape influences the speed in which a bushfire will spread and the severity of bushfire behaviour. Fires move faster and will be more severe when burning uphill than across flat ground or downhill. In general terms, the rate of forward spread of a fire burning uphill doubles for every ten degrees of slope (CSIRO 2015). The reverse is the case for down-slope.

The slope of the land within 5km of each of the three sites is shown in Figure 11, Figure 12 and Figure 13, which is generally flat (Hazelwood and Waratah Bay) to undulating (Driffield). The elevation of each of the sites above sea level is 10 m (Waratah Bay), 140 m to 150 m (Driffield), and 100 m (Hazelwood) as shown in Figure 6, Figure 8 and Figure 10 above.

6.5.4 Fire History

Mapping of available wildfire history within 5km of the project sites is shown in Figure 14, Figure 15 and Figure 16. Overall there is very minimal mapped fire history across the three sites. Indeed there is only one major wildfire mapped for the three sites, which was in 2014 and impacted the proposed Driffield site (DELW&P 2022). In addition however, there are other mapped wildfires in the Driffield locality.

For the Hazelwood site, there is no mapped direct bushfire impacts on the site that have been recorded in the available fire history records. However, the Hazelwood Mine fire in 2014 was of significance within the locality, particularly from an air quality perspective. The Hazelwood Mine fire reportedly originated from a grassfire spreading onto the mine site, leading to ignition of coal reserves and burnt for 45 days. Thus, the risk of fire originating from the proposed project site, spreading to downwind assets and potentially causing compounding impacts, is a factor considered in this assessment.

Whilst the compiled wildfire history mapping would not contain all bushfire occurrences, the collated fire history generally indicates a very low number of large bushfire events in the landscape for all sites.

The compiled fire history dataset indicates a lower likelihood of bushfires impacting on the subject sites of Hazelwood and Waratah Bay in the future, especially larger landscape scale events burning under significantly elevated bushfire weather conditions.

Conversely, the Driffield site has been impacted by fire during 2014 and also near the site during 1939, 2009, and then in 2013 and as such the incidence of repeated fire occurrences drawing on recorded fire history from 1939 to 2021 would be higher.

6.5.5 Bushfire Prone Areas and Bushfire Management Overlay

The VicPlan map share portal (www.mapshare.vic.gov) identifies the site areas of Hazelwood, Driffield, and Waratah Bay to be located within a Bushfire Prone Areas (BPA) and / or within Bushfire Management Overlay (BMO). These are shown in Figure 17, Figure 18, and Figure 19 below. In addition, the cable route traverses a variety of landscapes including BPA and BMO.

Both the BPA and BMO provide an indication of the presence of bushfire hazard, rather than an indicator as to the level of bushfire risk. The BPA and BMO mapped areas do not preclude any development occurring, but rather trigger consideration of appropriate land uses which reduce bushfire risk through the introduction of EPRs.

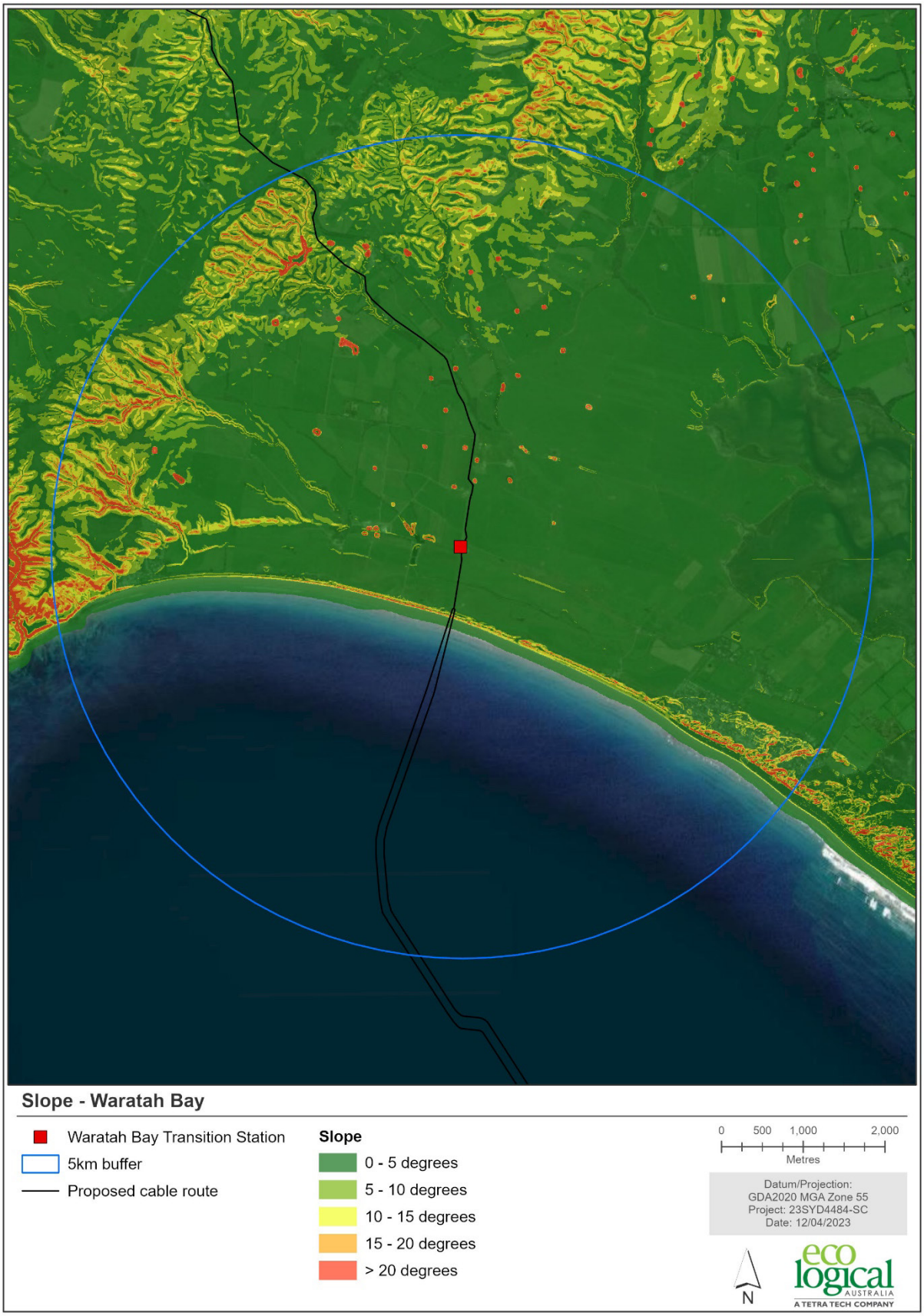


Figure 11: Slope map for Waratah Bay

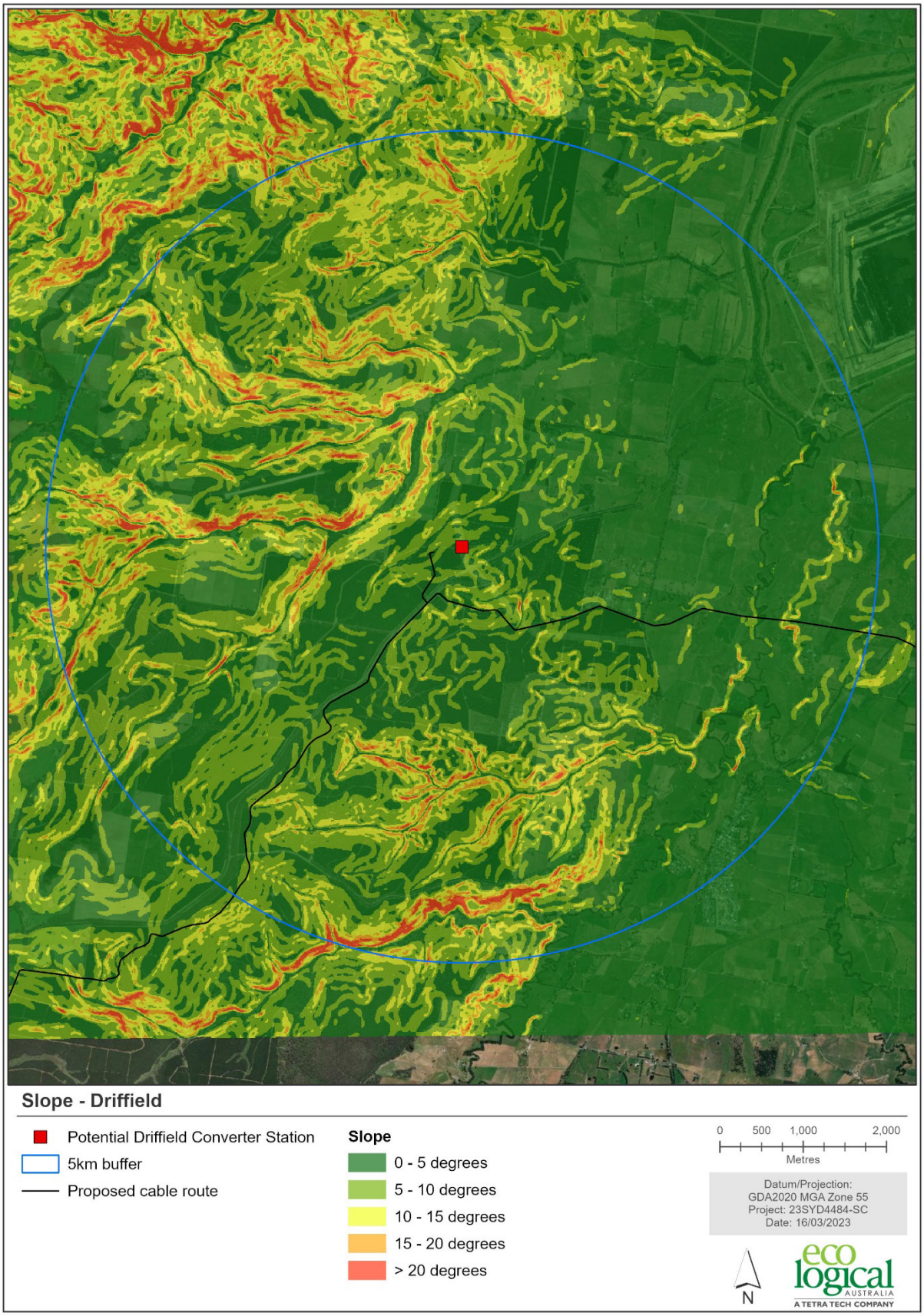


Figure 12: Slope map for Driffield

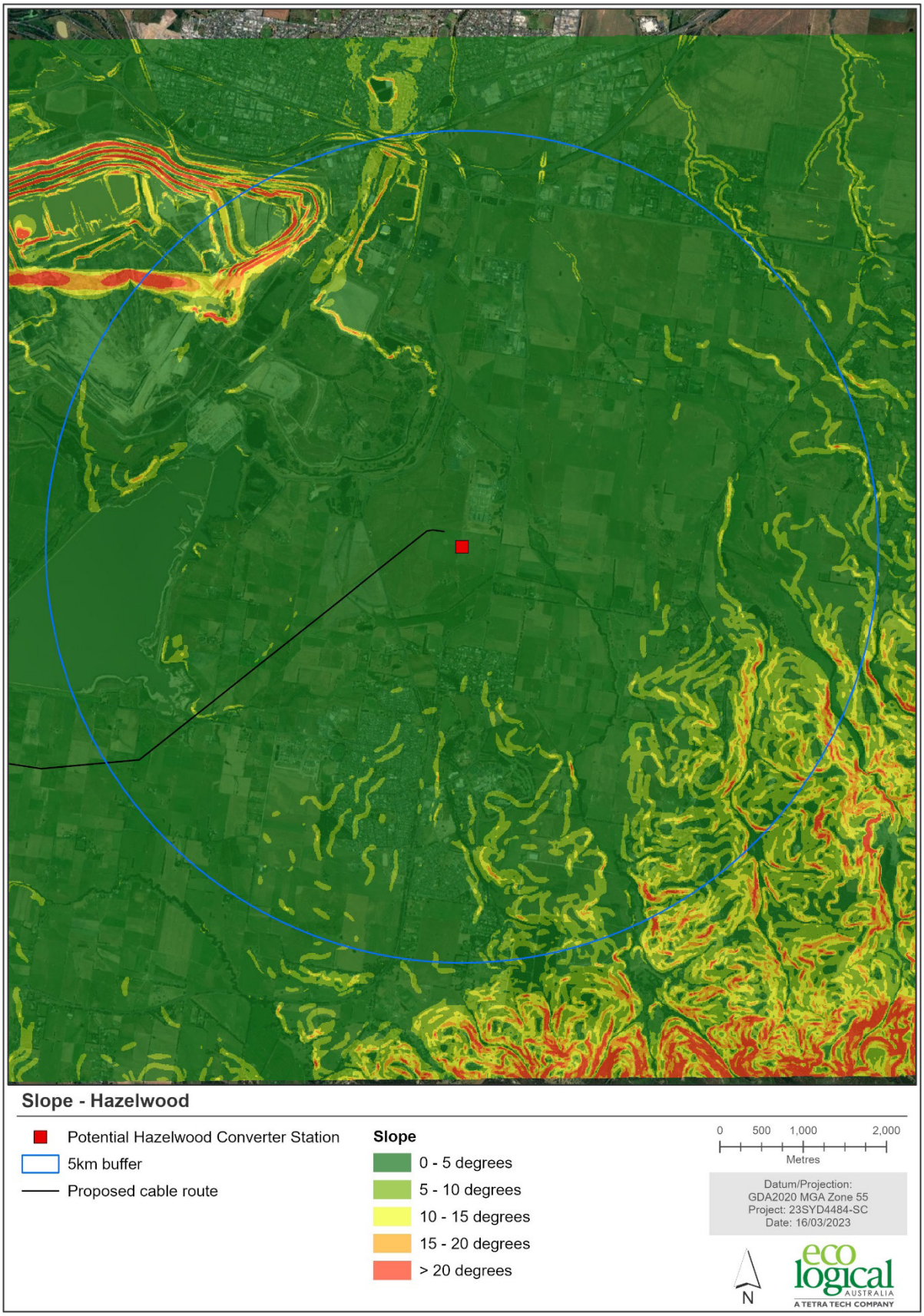


Figure 13: Slope map for Hazelwood

Figure 14: Fire History Waratah Bay (DEECA 2022)

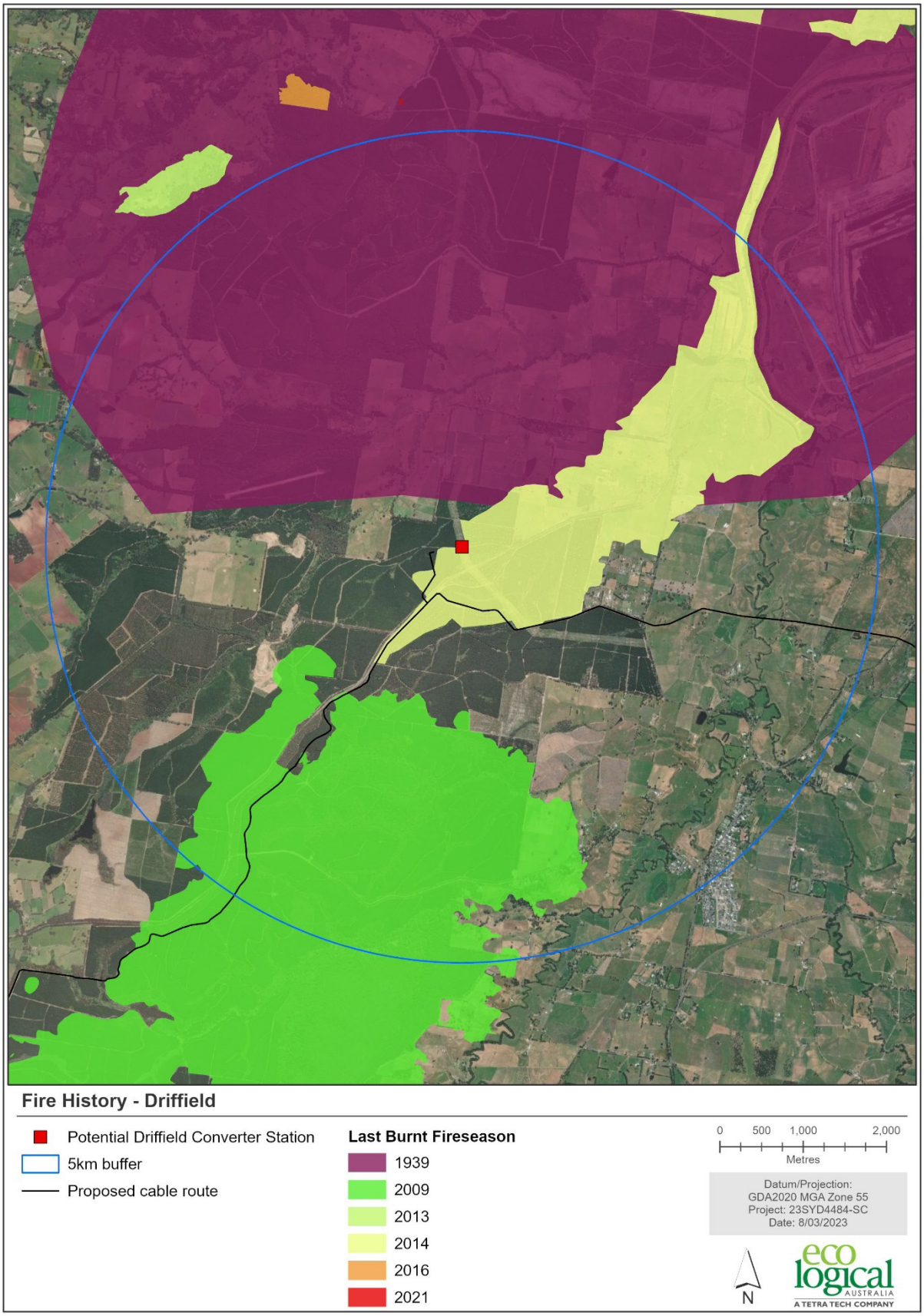


Figure 15: Fire History Driffield (DEECA 2022)

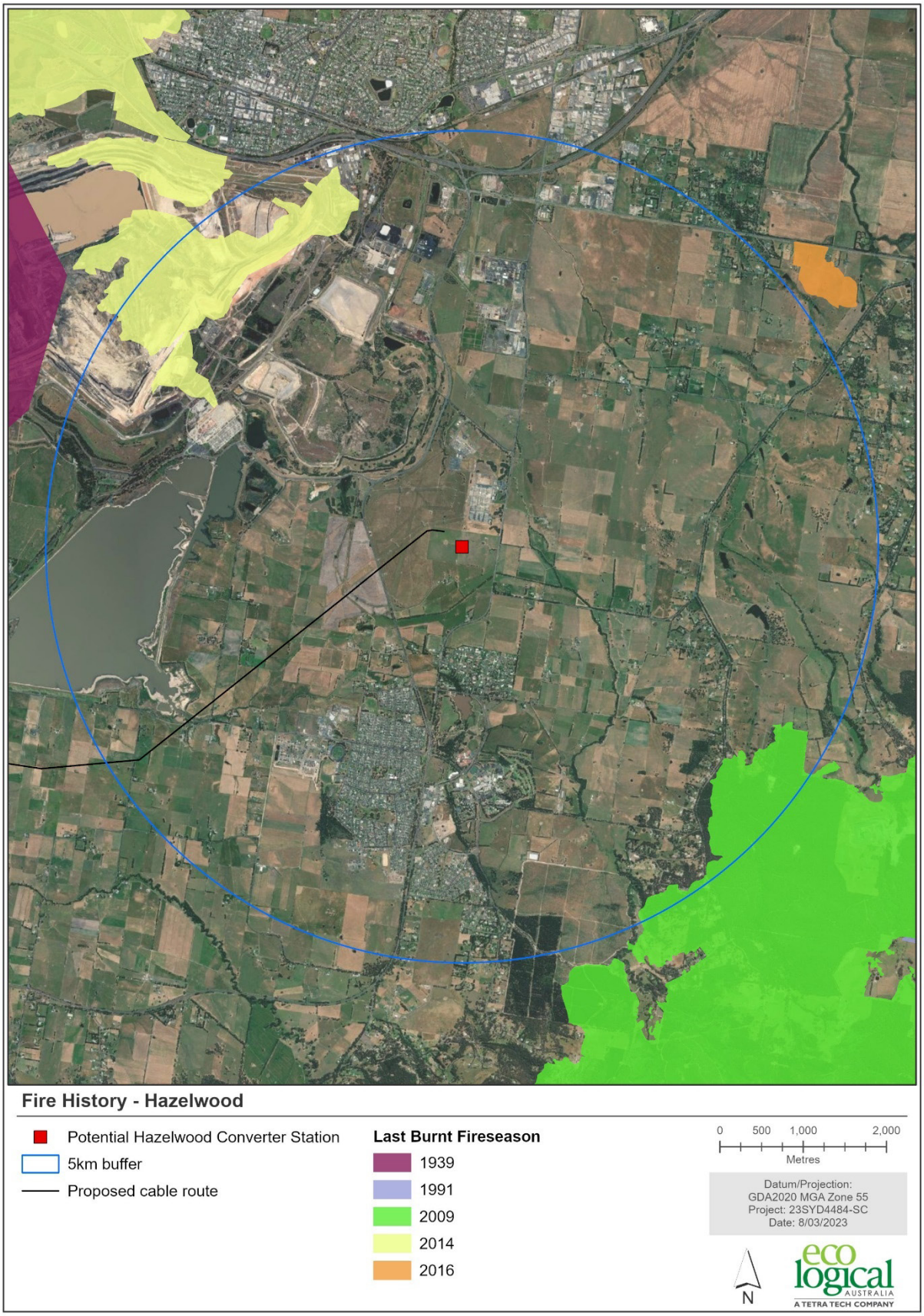


Figure 16: Fire History Hazelwood (DEECA 2022)

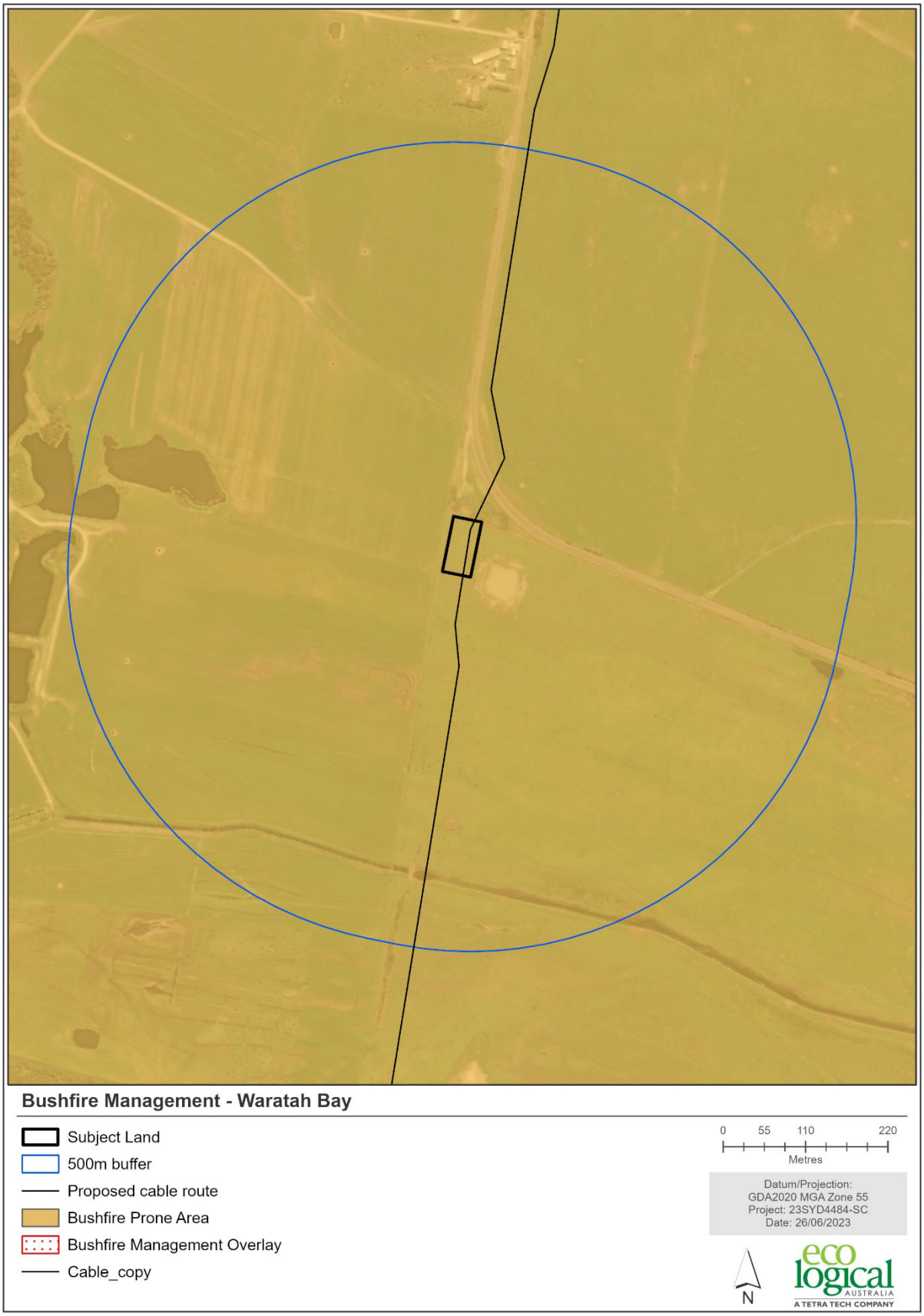


Figure 17: Waratah Bay Bushfire Prone Area Map

Figure 18: Driffield Bushfire Prone Areas and Bushfire Management Overlay Map

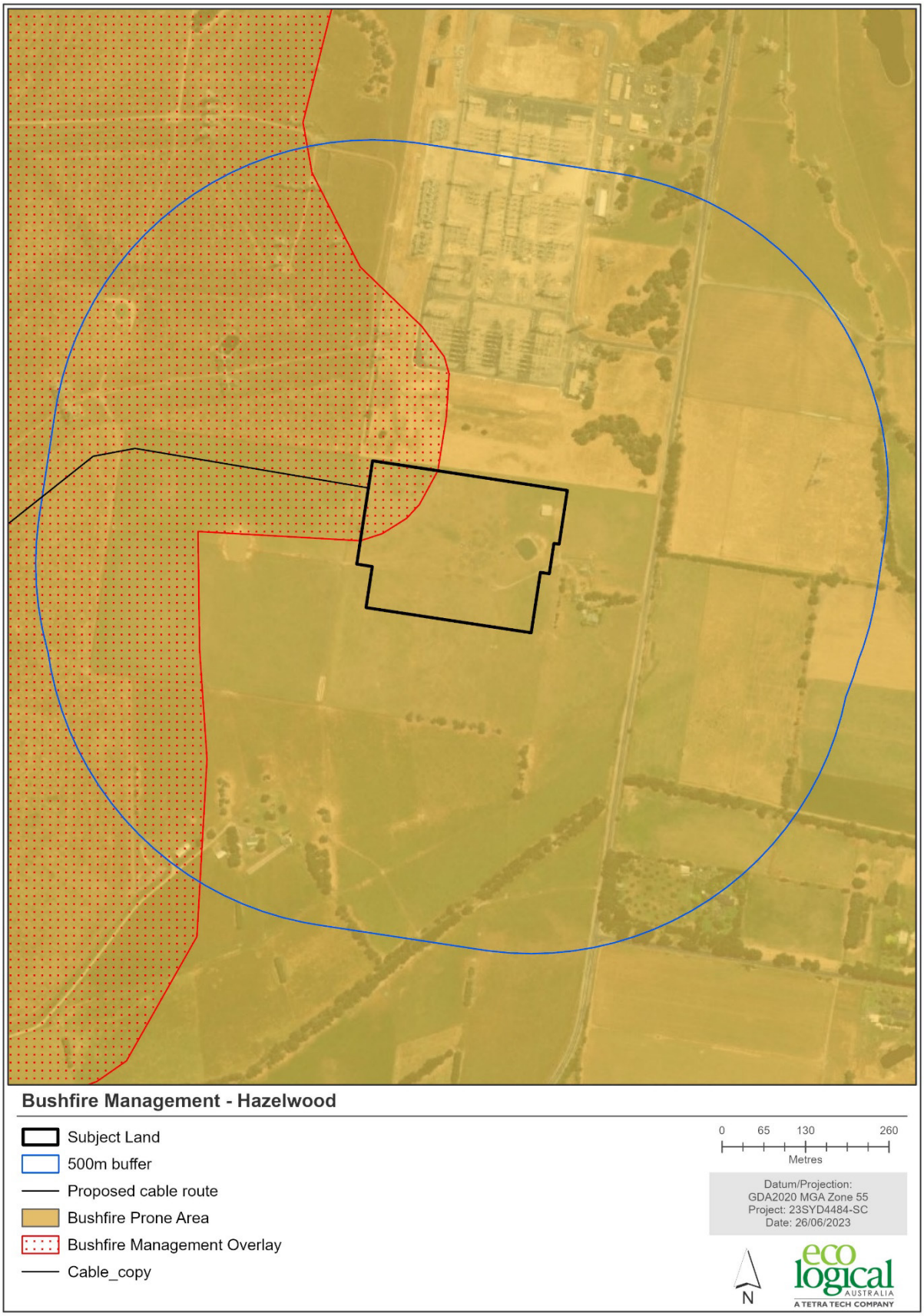


Figure 19: Hazelwood Bushfire Prone Areas and Bushfire Management Overlay Map

6.6 Summary of Bushfire Risk Context

Overall, for the study sites of Waratah Bay and Hazelwood it is considered that there is a relatively low risk of a fire starting and spreading to cause significant impact to life and damage to assets. This conclusion is based on the assets at risk, fuel types, terrain, ignition potential, fire weather, fire history, land use, and available fire suppression resources.

For the Waratah Bay and Hazelwood sites the level of fire risk is reduced to a much lower level than Driffield. This is due to the modification and reduction of grassland fuels around the sites through continued grazing practices and being a lower bushfire hazard type. This is in addition to the availability of fire suppression resources from nearby CFA stations; and potential disruptions on fire spread which lowers the risk. The sites also have a limited recorded fire history.

The Driffield site however is subject to a higher incidence of wildfire history and is situated in an exotic forest plantation which is a higher bushfire hazard type. The risk of fire propagation is higher for this site due to the poor early fire detection opportunities and increased access difficulties for fire suppression resources at CFA stations of Thorpdale, Yarragon and Morwell.

The HVDC cabling route presents a bushfire risk during the construction phase, however this varies depending on the location, hazard type and stage of construction and active works. Despite this, the HVDC cabling route has been assumed to be situated under a worst case hazard of forest, similar to Driffield, which has increased risks of fire propagation from the site from potential ignition sources namely hot works, machinery, and other sources where poor access together with poor early fire detection have the potential to hamper fire suppression activities.

7. Impact Assessment

This section presents the results of the risk impact assessments undertaken for the construction, operational, and decommissioning phases of the project, for the Waratah Bay, Driffield and Hazelwood sites.

7.1 Impact Pathways

The impact pathways determined for the project firstly takes into account the presence of a bushfire hazard source in close proximity to a potential fire ignition source occurring from each the three development sites. Secondly, once the fire has developed from the sites, consideration is then given to the assessment of the likely fire spread potential under adverse fire weather conditions with subsequent impact on surrounding at assets identified to be at risk from bushfire attack.

7.2 Construction

7.2.1 Potential Bushfire Risk Impacts

The potential bushfire impacts to life and property during the construction phase are outlined in the vulnerability criteria presented in the risk assessment tables below.

7.2.1.1 Waratah Bay and Hazelwood Sites (Low Hazard Sites)

Bushfire risk to life and property during the construction stage for both the Waratah Bay and Hazelwood sites are shown in Table 8 and Table 9.

The risk of impact to life for both the Waratah Bay and Hazelwood sites has been determined to be insignificant to minor (Table 8) given the relatively low and dispersed human population particularly across agricultural landholdings, which are largely managed in a low hazard grassland state. As such the likelihood of fire propagation across the landscape and the consequence of significant impact to life is reduced.

The risk of impact to property assets (including agricultural lands) for both the Waratah Bay and Hazelwood sites has been determined to be insignificant to minor (Table 9) given not only the very dispersed nature of built assets (such as dwellings, major sheds, and other infrastructure) but the location of these within agricultural landholdings which are managed in a low hazard grassland state. As such the likelihood of widespread fire propagation across the landscape and the consequence of significant impact to property assets is reduced.

Table 8: Bushfire Risk Assessment-Life.

Vulnerability Criteria	Consequence (A)	Likelihood (B)	Level of Risk (A x B)	Initial Risk Rating
Populated area where the combination of threat and vulnerability expose a community to a significant likelihood of fatalities and major injuries.	5	1	5	Minor

Vulnerability Criteria	Consequence (A)	Likelihood (B)	Level of Risk (A x B)	Initial Risk Rating
Less likely to be fatalities or major injuries due to the presence of attributes which afford some protection.	3	1	3	Insignificant
Loss of life or major injury highly unlikely. Medical/hospital treatment may be required.	3	2	6	Minor
Minor injuries only - first aid treatment. No major injuries or fatalities likely.	2	3	6	Minor
No injuries or fatalities likely.	1	3	3	Insignificant

Table 9: Bushfire Risk Assessment-Property (Assets including Agricultural Lands).

Vulnerability Criteria	Consequence (A)	Likelihood (B)	Level of Risk (A x B)	Initial Risk Rating
Extensive and widespread loss of property. Major impact across a large part of the community and region. Long term external assistance required to recover.	5	1	5	Minor
Localised damage to property. Short-term external assistance required to recover.	4	2	8	Minor
Short-term damage to individual assets. No external assistance required to recover.	2	3	6	Minor
Inconsequential or no damage to property. Little or no disruptions to the community.	1	3	3	Insignificant

7.2.1.2 Driffield Site and Cabling Route (High Hazard Site)

Bushfire risk to life and property for the construction stage of the Driffield site (including HVDV Cabling works) are shown in Table 10 and Table 11.

The risk of impact to life for the Driffield site (including HVDC cabling works) has been determined to be insignificant to minor (Table 10) given the relatively low and dispersed human population located externally to the adjoining pine plantations/forested areas and which are located within agricultural landholdings that are generally managed in a low hazard grassland state. Also, the increased density of established road infrastructure within the pine plantations/forested areas surrounding the site offers increased opportunities for fire containment to smaller areas. As such the likelihood of fire propagation across the landscape and the consequence of significant impact to life is reduced.

The risk of impact to property assets (including pine plantations/forested areas and agricultural lands) for the Driffield site (including the HVDC cabling works) has been determined to be insignificant to minor (Table 11). Firstly, with the increased density of established road infrastructure within the pine plantations/forest areas surrounding the site, this offers increased opportunities to contain fire outbreaks to relatively small areas. Secondly, beyond the established pine plantations /forested areas,

there is a very dispersed occurrence of built assets (such as dwellings, major sheds, and other infrastructure) and these are largely all located within agricultural landholdings which are managed in a low hazard grassland state. As such the likelihood of widespread fire propagation across the landscape and the consequence of significant impact to property assets is reduced.

Table 10: Bushfire Risk Assessment-Life.

Vulnerability Criteria	Consequence (A)	Likelihood (B)	Level of Risk (A x B)	Initial Risk Rating
Populated area where the combination of threat and vulnerability expose a community to a significant likelihood of fatalities and major injuries.	5	1	5	Minor
Less likely to be fatalities or major injuries due to the presence of attributes which afford some protection.	4	1	4	Insignificant
Loss of life or major injury highly unlikely. Medical/hospital treatment may be required.	3	2	6	Minor
Minor injuries only - first aid treatment. No major injuries or fatalities likely.	2	3	6	Minor
No injuries or fatalities likely.	1	3	3	Insignificant

Table 11: Bushfire Risk Assessment-Property (Assets including Plantations and Agricultural Lands).

Vulnerability Criteria	Consequence (A)	Likelihood (B)	Level of Risk (A x B)	Initial Risk Rating
Extensive and widespread loss of property. Major impact across a large part of the community and region. Long term external assistance required to recover.	5	1	5	Minor
Localised damage to property. Short-term external assistance required to recover.	4	2	8	Minor
Short-term damage to individual assets. No external assistance required to recover.	3	3	9	Minor
Inconsequential or no damage to property. Little or no disruptions to the community.	1	4	4	Insignificant

7.2.2 Environmental Performance Requirements

The following EPR in Table 12 are proposed during the construction stage to minimise the level of some potential bushfire risks. These proposed EPRs are fully specified in Section 7.5.

Table 12: Bushfire Mitigation Environmental Performance Requirements – Construction Stage

EPR ID*	Environmental Performance Requirement	Project Stage
BF01	**Develop and implement measures to avoid and manage ignition of fires during construction**	Construction
BF02	**Provide onsite firefighting water capacity in high fire risk areas**	Construction
BF03	**Prepare and implement a Bushfire Emergency Management Plan (BEMP)**	Construction

7.2.3 Residual Impacts

In line with the EPRs, activity or location specific mitigation measures will be required to be developed and incorporated into the design to ensure appropriate mitigation is achieved during the construction phase.

For the Waratah Bay, Hazelwood and Driffield (including HVDC cabling route) sites the assessment of risk to both life and property, with the introduction of EPRs this reduces the residual risk from minor to insignificant. The residual risk reduction is reliant on effective development and implementation of all identified EPR's for the construction phase in Table 12.

7.3 Operation

7.3.1 Potential Bushfire Risk Impacts

The potential bushfire impacts to life and property during the operation phase are outlined in the vulnerability criteria presented in the risk assessment tables below.

7.3.1.1 Waratah Bay and Hazelwood Sites (Low Hazard Sites)

Bushfire risk to life and property during the operation stage for both the Waratah Bay and Hazelwood sites are shown in Table 13 and Table 14.

The risk of impact to life for both the Waratah Bay and Hazelwood sites has been determined to be insignificant to minor (Table 13) given the relatively low and dispersed human population, particularly across agricultural landholdings which are largely managed in a low hazard grassland state. As such the likelihood of fire propagation across the landscape and the consequence of significant impact to life is reduced.

The risk of impact to property assets (including agricultural lands) for both the Waratah Bay and Hazelwood sites has been determined to be insignificant to minor (Table 14) given not only the very dispersed nature of built assets (such as dwellings, major sheds, and other infrastructure) but the location of these within agricultural landholdings which are managed in a low hazard grassland state. As such the likelihood of widespread fire propagation across the landscape and the consequence of significant impact to property assets is reduced.

Table 13: Bushfire Risk Assessment-Life.

Vulnerability Criteria	Consequence (A)	Likelihood (B)	Level of Risk (A x B)	Initial Risk Rating
Populated area where the combination of threat and vulnerability expose a community to a significant likelihood of fatalities and major injuries.	5	1	5	Minor
Less likely to be fatalities or major injuries due to the presence of attributes which afford some protection.	4	1	4	Insignificant
Loss of life or major injury highly unlikely. Medical/hospital treatment may be required.	3	1	3	Insignificant
Minor injuries only - first aid treatment. No major injuries or fatalities likely.	2	1	2	Insignificant
No injuries or fatalities likely.	1	1	1	Insignificant

Table 14: Bushfire Risk Assessment-Property (Assets including Agricultural Lands).

Vulnerability Criteria	Consequence (A)	Likelihood (B)	Level of Risk (A x B)	Initial Risk Rating
Extensive and widespread loss of property. Major impact across a large part of the community and region. Long term external assistance required to recover.	5	1	5	Minor
Localised damage to property. Short-term external assistance required to recover.	4	2	8	Minor
Short-term damage to individual assets. No external assistance required to recover.	2	2	4	Insignificant
Inconsequential or no damage to property. Little or no disruptions to the community.	1	2	2	Insignificant

7.3.1.2 Driffield Site (High Hazard Site)

Bushfire risk to life and property for the operation stage of the Driffield site are shown in Table 15 and Table 16.

The risk of impact to life for the Driffield site has been determined to be insignificant to minor (Table 15) given the relatively low and dispersed human population located externally to adjoining pine plantations, which are located within agricultural landholdings that are managed in a low hazard grassland state. Also, the increased density of established road infrastructure within the pine plantations surrounding the site offers increased opportunities for fire containment to smaller areas. As such the

likelihood of fire propagation across the landscape and the consequence of significant impact to life is reduced.

The risk of impact to property assets (including pine plantations and agricultural lands) for the Driffield site has been determined to be insignificant to minor (Table 16). Firstly, with the increased density of established roads infrastructure within the pine plantations surrounding the site, this offers increased opportunities to contain fire outbreaks to relatively small areas. Secondly, beyond the established pine plantations, there is a very dispersed occurrence of built assets (such as dwellings, major sheds, and other infrastructure) that are largely all located within agricultural landholdings which are managed in a low hazard grassland state. As such the likelihood of widespread fire propagation across the landscape and the consequence of significant impact to property assets is reduced.

Table 15: Bushfire Risk Assessment-Life.

Vulnerability Criteria	Consequence (A)	Likelihood (B)	Level of Risk (A x B)	Initial Risk Rating
Populated area where the combination of threat and vulnerability expose a community to a significant likelihood of fatalities and major injuries.	5	1	5	Minor
Less likely to be fatalities or major injuries due to the presence of attributes which afford some protection.	4	1	4	Insignificant
Loss of life or major injury highly unlikely. Medical/hospital treatment may be required.	3	1	3	Insignificant
Minor injuries only - first aid treatment. No major injuries or fatalities likely.	2	1	2	Insignificant
No injuries or fatalities likely.	1	1	1	Insignificant

Table 16: Bushfire Risk Assessment-Property (Assets including Plantations and Agricultural Lands).

Vulnerability Criteria	Consequence (A)	Likelihood (B)	Level of Risk (A x B)	Initial Risk Rating
Extensive and widespread loss of property. Major impact across a large part of the community and region. Long term external assistance required to recover.	5	1	5	Minor
Localised damage to property. Short-term external assistance required to recover.	3	2	6	Minor
Short-term damage to individual assets. No external assistance required to recover.	2	3	6	Minor
Inconsequential or no damage to property. Little or no disruptions to the community.	1	4	4	Insignificant

7.3.2 Environmental Performance Requirements

The following EPR in Table 17 are proposed during the operation stage to minimise the level of some potential bushfire risks. These proposed EPRs are fully specified in Section 7.5.

Table 17: Bushfire Mitigation Environmental Performance Requirements – Operations Stage

EPR ID	Environmental Performance Requirement	Project Stage
BF02	**Provide onsite firefighting water capacity in high fire risk areas**	Operation
BF03	**Prepare and implement a Bushfire Emergency Management Plan (BEMP)**	Operation
BF04	**Develop and implement measures to avoid and manage ignition risks during operation**	Operation

7.3.3 Residual Impacts

In line with the EPRs, activity or location specific mitigation measures will be required to be developed and incorporated into the design to ensure appropriate mitigation is achieved during the operational phase.

For the Waratah Bay Hazelwood and Driffield sites the assessment of risk to both life and property, with the introduction of EPRs this reduces the residual risk from minor to insignificant. The residual risk reduction is reliant on effective development and implementation of all identified EPR's for the operations phase in Table 17.

7.4 Decommissioning

7.4.1 Potential Bushfire Risk Impacts

The potential bushfire impacts to life and property during the decommissioning phase are outlined in the vulnerability criteria presented in the risk assessment tables below.

7.4.1.1 Waratah Bay and Hazelwood Sites (Low Hazard Sites)

Bushfire risk to life and property during the decommissioning stage for both the Waratah Bay and Hazelwood sites are shown in Table 18 and

Table 19.

The risk of impact to life for both the Waratah Bay and Hazelwood sites has been determined to be insignificant to minor (Table 18) given the relatively low and dispersed human population particularly across agricultural landholdings which are largely managed in a low hazard grassland state. As such the likelihood of fire propagation across the landscape and the consequence of significant impact of life is reduced.

The risk of impact to property assets (including agricultural lands) for both the Waratah Bay and Hazelwood sites has been determined to be insignificant to minor (Table 19) given not only the very dispersed occurrence of built assets (such as dwellings, major sheds, and other infrastructure) but the location of these within agricultural landholdings which are managed in a low hazard grassland state. As such the likelihood of widespread fire propagation across the landscape and the consequence of significant impact to property assets is reduced.

Table 18: Bushfire Risk Assessment-Life.

Vulnerability Criteria	Consequence (A)	Likelihood (B)	Level of Risk (A x B)	Initial Risk Rating
Populated area where the combination of threat and vulnerability expose a community to a significant likelihood of fatalities and major injuries.	5	1	5	Minor
Less likely to be fatalities or major injuries due to the presence of attributes which afford some protection.	3	1	3	Insignificant
Loss of life or major injury highly unlikely. Medical/hospital treatment may be required.	3	1	3	Insignificant
Minor injuries only - first aid treatment. No major injuries or fatalities likely.	2	1	2	Insignificant
No injuries or fatalities likely.	1	1	1	Insignificant

Table 19: Bushfire Risk Assessment-Property (Assets including Agricultural Lands).

Vulnerability Criteria	Consequence (A)	Likelihood (B)	Level of Risk (A x B)	Initial Risk Rating
Extensive and widespread loss of property. Major impact across a large part of the community and region. Long term external assistance required to recover.	5	1	5	Minor
Localised damage to property. Short-term external assistance required to recover.	4	1	4	Insignificant
Short-term damage to individual assets. No external assistance required to recover.	2	1	2	Insignificant
Inconsequential or no damage to property. Little or no disruptions to the community.	1	1	1	Insignificant

7.4.1.2 Driffield Site (High Hazard Site)

Bushfire risk to life and property for the construction stage of the Driffield site are shown in Table 20 and Table 21.

The risk of impact to life for the Driffield site has been determined to be insignificant to minor (Table 20) given the relatively low and dispersed human population located externally to adjoining pine plantations, which are located within agricultural landholdings that are managed in a low hazard grassland state. Also, the increased density of established road infrastructure within the pine plantations surrounding the site offers increased opportunities for fire containment to smaller areas. As such the

likelihood of fire propagation across the landscape and the consequence of significant impact to life is reduced.

The risk of impact to property assets (including pine plantations and agricultural lands) for the Driffield site has been determined to be insignificant to minor (Table 21). Firstly, with the increased density of established roads infrastructure within the pine plantations surrounding the site, this offers increased opportunities to contain fire outbreaks to relatively small areas. Secondly, beyond the established pine plantations there is a very dispersed occurrence of built assets (such as dwellings, major sheds, and other infrastructure) which are largely all located within agricultural landholdings that are managed in a low hazard grassland state. As such the likelihood of widespread fire propagation across the landscape and the consequence of significant impact to property assets is significantly reduced.

Table 20: Bushfire Risk Assessment-Life.

Vulnerability Criteria	Consequence (A)	Likelihood (B)	Level of Risk (A x B)	Initial Risk Rating
Populated area where the combination of threat and vulnerability expose a community to a significant likelihood of fatalities and major injuries.	5	1	5	Minor
Less likely to be fatalities or major injuries due to the presence of attributes which afford some protection.	4	1	4	Insignificant
Loss of life or major injury highly unlikely. Medical/hospital treatment may be required.	3	1	3	Insignificant
Minor injuries only - first aid treatment. No major injuries or fatalities likely.	2	1	3	Insignificant
No injuries or fatalities likely.	1	3	3	Insignificant

Table 21: Bushfire Risk Assessment-Property (Assets including Plantations and Agricultural Lands).

Vulnerability Criteria	Consequence (A)	Likelihood (B)	Level of Risk (A x B)	Initial Risk Rating
Extensive and widespread loss of property. Major impact across a large part of the community and region. Long term external assistance required to recover.	5	1	5	Minor
Localised damage to property. Short-term external assistance required to recover.	5	1	5	Minor
Short-term damage to individual assets. No external assistance required to recover.	3	1	3	Insignificant
Inconsequential or no damage to property. Little or no disruptions to the community.	1	1	1	Insignificant

7.4.2 Environmental Performance Requirements

A land decommissioning management plan will be prepared to outline how decommissioning activities would be undertaken and potential impacts managed. This will be located within Volume 5, Chapter 2 – Environmental Management Framework chapter of the EIS/EES.

7.5 Environmental Performance Requirements

The recommended EPRs to reduce the risk of all potential bushfire impacts to low, are set out in Table 22. Note that the construction phase EPRs identified are inclusive of the requirements for the temporary mobile site (i.e. all underground cabling works).

The successful implementation of the identified EPRs below are reliant on the undertaking of appropriate inspection and review outcomes as identified in Section 7.7.

Table 22 Environmental Performance Requirements relevant to BIA

EPR ID*	Environmental Performance Requirement	Project Stage
BF01	**Develop and implement measures to avoid and manage ignition of fires during construction** Prior to commencement of project works, develop a bushfire protocol as part of the CEMP to: • Avoid and minimise high risk activities on Total Fire Ban Days. • Maintain fuels to low levels within the sites prior to and during the bushfire danger periods. • Maintain vehicles, plant and machinery in accordance with specifications to prevent fire ignition from their operation. • Mitigate ignition risks from electrical faults. • Establish and maintain vehicle access to the site and surrounds for fire suppression activities by fire fighting authorities.	Construction
BF02	**Provide onsite firefighting water capacity in high fire risk areas** Prior to commencement of project works, develop a protocol for the provision of dedicated onsite water supply tanks or alternative water sources for firefighting in high fire risk areas. The protocol must include: • Provision of mobile water carts along the cable route to supplement emergency water supply for onsite personnel and emergency services. • For the fixed sites, use tank(s) that are non-combustible and incorporate appropriate fire fighting fittings, for emergency services to access the water supply. • Maintaining clear access to tanks or water sources for fire fighting vehicles. • Providing sufficient water capacity to undertake adequate fire suppression. • Provision of trained personnel and equipment. High fire risk areas are areas in the natural landscape that are located in both a Bushfire Prone Area and/or the Bushfire Management Overlay. This protocol should be referenced in the Emergency Response Plan.	Construction/ Operation
BF03	**Prepare and implement a Bushfire Emergency Management Plan (BEMP)** As a subplan to the project's Emergency Response Plan, prepare and implement a BEMP that includes, but is not limited to: • Description of the site facility • Provide details of all emergency procedures	Construction / Operation

EPR ID*	Environmental Performance Requirement	Project Stage
	• Emergency preparedness arrangements • Details of all shelter in place and offsite evacuation procedures	
BF04	**Develop and implement measures to avoid and manage ignition risks during operation** Develop and implement a protocol for: • Avoiding high risk activities on Total Fire Ban Days. • Maintenance of converter station infrastructure. • Maintenance of fire fighting systems and water tank capacity at the converter stations. • Maintaining vehicle access to the site and surrounds for fire suppression activities by fire fighting authorities. • Operation of electrical infrastructure to minimise ignition risk and maintain monitoring and management systems (emergencies, fault management, system monitoring, fire detection and suppression). • Provision of trained personnel and equipment. This protocol should be referenced in the Emergency Response Plan.	Operation

7.6 Cumulative Impacts

The EIS guidelines and EES scoping requirements both include requirements for the assessment of cumulative impacts. Cumulative impacts result from incremental impacts caused by multiple projects occurring at similar times and within proximity to each other.

To identify possible projects that could result in cumulative impacts, the International Finance Corporation (IFC) guidelines on cumulative impacts have been adopted. The IFC guidelines (IFC, 2013) define cumulative impacts as those that 'result from the successive, incremental, and/or combined effects of an action, project, or activity when added to other existing, planned, and/or reasonably anticipated future ones.'

The approach for identifying projects for assessment of cumulative impacts considers:

- Temporal boundary: the timing of the relative construction, operation and decommissioning of other existing developments and/or approved developments that coincides (partially or entirely) with the project.
- Spatial boundary: the location, scale and nature of the other approved or committed projects expected to occur in the same area of influence as the project. The area of influence is defined as the spatial extent of the impacts a project is expected to have.
- Proposed and reasonably foreseeable projects were identified based on their potential to credibly contribute to cumulative impacts due to their temporal and spatial boundaries. Projects were identified based on publicly available information at the time of assessment. The projects considered for cumulative impact assessment in Victoria are:
- Delburn Wind farm
- Star of the South Offshore Wind farm
- Offshore wind development zone in Gippsland including Greater Gippsland Offshore Wind Project (BlueFloat Energy), Seadragon Project (Floatation Energy), Greater Eastern Offshore Wind (Corio Generation).
- Hazelwood Mine Rehabilitation Project

- Wooreen Energy Storage System

The potential bushfire impacts of the project before the implementation of mitigation measures (as discussed in Section 7.2 to 7.4) varies from insignificant to minor risk to life and property over the construction, operation and decommissioning stages. With introduction of EPRs for all stages of the development the residual risk is reduced overall to be insignificant.

There also exists capacity of local CFA brigades to provide fire response to fire outbreaks not only across these the Project sites but extending to provide adequate fire coverage to the nearby Delburn Wind farm project from the CFA station localities of Morwell, Moe South, Thorpdale, Boolarra, and Mirboo North.

In assessing other relevant projects within the region that could trigger cumulative impacts that in combination with required EPRs and associated mitigation measures for each project there is an extremely low risk of simultaneous fire propagation within the landscape. As such the cumulative impacts are considered to be insignificant and warrant no further consideration within the context of this assessment.

7.7 Inspection and Review

The requirements for the inspection and review of residual impacts at each of the construction, operations and decommissioning stages of the project are indicated in Table 23. It presents the inspection, compliance, and review requirements so as to achieve residual impact mitigation outcomes at each stage of the project from the assigned EPR.

Table 23: Inspection, and review requirements at various stages of the project for EPRs

Project Stage	Inspection or Compliance Requirement	Review Period
Construction	• Bushfire Ignition Management Plan (BIMP) is prepared. • Fuel management establishment and maintenance activities within each of the designated sites. • Installation of electrical infrastructure meets Australian Standard requirements to reduce unwanted ignition potential. • Installation, testing and certification of water tank and water supply for fire fighting. • Installation of vehicle access roads for fire fighting. • Bushfire Emergency Management Plan (BEMP) is prepared. • Asset Protection Zone of infrastructure from bushfire hazard • Infrastructure designed to incorporate fire resistant materials and prevent ignitions. Onsite personnel training in fire fighting.	• BIMP in place prior to commencement of construction phase and reviewed annually. • Fuels managed to required specification prior to commencement of construction phase and maintain throughout. Review quarterly • Powerline infrastructure installed at completion of construction stage. • Water tank and supply installed prior to primary construction phase. • Access road constructed prior to primary construction phase. • BEMP is prepared prior to commencement of construction phase and updated annually. • Asset Protection Zone in place prior to construction phase commencing. • Infrastructure certified at construction stage. Fire fighting personnel certified prior to construction phase.
Operation	• Maintain water tank and water supply for fire fighting. • Maintain access road in a trafficable condition and free from obstructions. • Operations maintenance of onsite facilities.	• Water supply infrastructure inspected monthly during fire season. • Access road inspected generally once annually but monthly during fire season. • Operational facilities inspected annually or on spot maintenance basis.

7.8 Summary of Impacts

A summary of the impact assessment from bushfire against the risk assessment criteria is presented in Table 24. The potential risk and risk ratings depicted in Table 24 have been assigned from the highest derived risk level identified in the impact assessment undertaken in Sections 7.2 to 7.3. This entailed assigning the highest derived initial risk level rating obtained in each of the risk impact vulnerability tables across all of the sites and project stages for life and property assets.

Table 24: Summary of Risk Assessment and Impacts

Affected Value	Potential Risk of Harm	Project Phase	Likelihood Rating	Consequence Rating	Initial Risk Rating	EPRs	Residual Likelihood Rating	Residual Consequence Rating	Residual Risk Rating
Life - Waratah Bay and Hazelwood	Minor	Construction	1	5	Minor (5)	BF01, BF02, BF03	1	4	Insignificant (4)
Property - Waratah Bay and Hazelwood	Minor	Construction	1	5	Minor (5)	BF01, BF02, BF03	1	4	Insignificant (4)
Life - Driffield	Minor	Construction	1	5	Minor (5)	BF01, BF02, BF03	1	4	Insignificant (4)
Property - Driffield	Minor	Construction	1	5	Minor (5)	BF01, BF02, BF03	1	4	Insignificant (4)
Life - Waratah Bay and Hazelwood	Minor	Operation	1	5	Minor (5)	BF02, BF03, BF04	1	4	Insignificant (4)
Property - Waratah Bay and Hazelwood	Minor	Operation	2	4	Minor (8)	BF02, BF03, BF04	1	4	Insignificant (4)
Life - Driffield	Minor	Operation	5	1	Minor (5)	BF02, BF03, BF04	4	1	Insignificant (4)
Property- Driffield	Minor	Operation	3	2	Minor (6)	BF02, BF03, BF04	3	1	Insignificant (3)
Life - Waratah Bay and Hazelwood	Minor	Decommissioning	1	5	Minor (5)	EMF 4	1	4	Insignificant (4)
Property - Waratah Bay and Hazelwood	Minor	Decommissioning	1	5	Minor (5)	EMF 4	1	4	Insignificant (4)
Life - Driffield	Minor	Decommissioning	1	5	Minor (5)	EMF 4	1	4	Insignificant (4)
Property - Driffield	Minor	Decommissioning	1	5	Minor (5)	EMF 4	1	4	Insignificant (4)

8. Conclusion

The purpose of this report is to address the overall DCCEEW Commonwealth EPBC EIS Guidelines and the Victorian Minister for Planning EES scoping requirements (as prepared by the DEECA) for the project. Specifically, a Bushfire Impact Assessment (BIA) has been undertaken for the identified sites using a risk assessment approach together with the identification of EPRs to seek further risk reduction opportunities through the provision of suitable bushfire mitigation measures.

Overall, the potential residual risk to 'at risk assets' of bushfire impacting from the sites during the construction, operation and decommissioning stages is considered to be minor to insignificant, given the background bushfire hazard context, landscape profile, siting and EPRs identified.

The EPRs as identified in Section 7.5 significantly lower the residual risk of impacts from the proposed development on life and property (including human settlement, agricultural and plantation assets) which are as shown in Section 7.8.

Key EPRs identified from this assessment incorporate mitigation measures identified targeting bushfire ignition management, bulk static water capacity, access, operations maintenance, and bushfire emergency management planning.

Through adoption of the inspection and review schedule in Section 7.7 (based on the identified EPRs in Section 7.5) this should see a reduction of residual risk to be insignificant for all study sites.

9. References

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