Appendix K

Agriculture and forestry

MARINUS LINK

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Marinus Link

Agriculture and forestry technical report

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MARINUS LINK

Prepared for:

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QUALITY INFORMATION

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EXECUTIVE SUMMARY

Marinus Link (the project) is an initiative to provide power exchange between the respective state electricity transmission networks of Victoria and Tasmania. The project comprises a 1500 megawatt (MW) high voltage direct current electricity interconnector between Tasmania and Victoria. This will allow for the continued trading and distribution of electricity within the National Energy Market.

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 Environmental Impact Statement/Environment Effects Statement (EIS/EES) is being prepared to address the requirements of DTP and DCCEEW. A separate EIS is being prepared to address the Tasmanian EPA requirements.

This report considers the agricultural and forestry activities within the 90 km corridor from Waratah Bay, South Gippsland to the proposed Hazelwood terminal station in the Latrobe Valley. This report assesses the impacts of the project on agriculture and forestry in the construction and operation phase of the project.

The South Gippsland and Latrobe Valley regions major agricultural production streams include beef, dairy farming and horticulture. Other agricultural enterprises include, prime lambs, cropping, wool, horses and mixed grazing. Extensive plantation forests occur in the Strzelecki Ranges and foothills, with softwood plantations the major plantation forestry activity in the project area.

Two key agricultural values were determined, being land capability and farm or plantation infrastructure, practices and planning.

A significance assessment using the parameters of sensitivity and magnitude was undertaken to assess the impacts of the project on the key values of agriculture and forestry. Sensitivity refers to how susceptible a given value is to potential impacts. Magnitude refers to how severe a given impact would be.

The potential impacts on agricultural values from the construction and operation of the project are:

- Reduced productivity or yields from disturbance during construction.
- Reduced productivity or yields caused by degraded soil structure, soil moisture content and fertility.
- Reduced amenity or reduced productivity or yields from dust emissions and deposition.
- Lost or reduced production or yields through ineffective biosecurity controls leading to introduction or spread of animal or plant pathogen or noxious weed infestation.
- Impact on production caused by need to modify or adopt alternative agricultural practices.
- Reduced farm income due to changes to operations and constraints on farm development plans.

The potential impacts on forestry values from the construction and operation of the project are:

- Temporary restrictions on plantation access and harvesting activities.
- Restrictions on plantation harvesting practices caused by the transmission infrastructure.
- Loss of wood stock from permanent clearing of trees.
- Reduced wood flows from permanent clearing of trees or pre-mature harvesting of trees.
- Loss of wood stock and reduced wood flow from introduced diseases (plant pathogens such as *Phytophthora cinnamomi*, which is more commonly known as dieback).
- Loss of wood stock and reduced wood flow from fire damage to trees.

The impact assessment provided that before the application of EPRs several agricultural industries, had high to major significance of impact on the value land capability, and high to major significance of impact on the value farm or plantation infrastructure, practices, and planning.

Six environmental performance requirements (EPRs) were identified to provide desirable outcomes for agriculture and forestry during the construction and operation phases of the project.

After the application of these EPRs, the organic farming and forestry agricultural industries had moderate impacts on the value land capability. Dairying and forestry had moderate impacts on the value farm or plantation infrastructure, practices and planning.

Residual impacts are expected to be short term and of low to moderate significance during the construction phase and low to very low significance in the operation phase.

Residual impacts from construction activities on land capability for the agricultural production activities relate to the success of rehabilitation. Soil compaction, soil inversion and changed soil moisture content can affect rehabilitation success and productivity. Staged execution of the project will result in some farming practices being disrupted for up to four years. During this period alternative arrangements will be implemented to reduce impacts on production and operating costs. Residual impacts from construction activities via the temporary relocation of farm infrastructure will be low, as affected farm infrastructure will be reinstated as soon as practicable following construction.

Operation and maintenance activities are unlikely to affect farm infrastructure, as the activities will be confined to cable joint pits or cable fault locations, which have relatively small footprints. The residual impact in operation for agriculture includes easement and land cables constraining farm development plans reducing options and flexibility in configuring paddocks and siting farm infrastructure to support diversified or alternative farming practices.

With the successful implementation of the EPRs the report concludes that the project would not result in significant impacts to agriculture and forestry, nor conflict with South Gippsland or Latrobe planning scheme ordinances.

Overall, agricultural and forestry impacts would generally be localised, site specific and temporary.

It is intended to return land and infrastructure to previous conditions post-development through the restoration of productive agricultural and plantation land and infrastructure, and the rehabilitation of natural environments where necessary.

ABBREVIATIONS

Term	Descriptions
ABS	Australian Bureau of Statistics
AOD	Area of disturbance
BOM	Bureau of Meteorology
DTP	Department of Transport and Planning
EE (Act)	Environment Effects Act 1978 (Vic)
EES	Environment Effects Statement
EIS	Environmental Impact Statement
EPBC (Act)	Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)
EPR	Environmental Performance Requirements
ha	hectare
HDD	horizontal directional drilling
HVAC	high voltage alternating current
HVDC	high voltage direct current
HVP	Hancock Victorian Plantations
km	kilometre
kV	kilovolt or 1000 volts
m	metre
MLPL	Marinus Link Pty Ltd
MW	megawatt or one million watts
NEM	National Electricity Market

1. INTRODUCTION

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 Electricity 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. A separate EIS is being prepared to address the Tasmanian EPA requirements.

As agricultural impacts only occur in Victoria, this report has been prepared 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 technical report is to inform the environmental impact assessment of the project which will be placed on public exhibition and accessible by the public, as well as be used by relevant government authorities to inform their assessment and decision making for project approvals.

The objective of this agriculture and forestry technical report is to assess the impacts of the project on agricultural and forestry land uses and businesses in Victoria.

To meet this objective, this technical report will:

- identify and assess land use categories and agricultural and forestry constraints for the project;
- estimate loss of productive yield due to the project's construction and operation;
- identify potential effects of the project on agriculture and forestry, considering direct and indirect impacts on existing and reasonably foreseeable agricultural or forestry activities and businesses;
- assess agricultural and forestry impacts in the context of the industry and region, as well as on the basis of farm type, practices and landform and soil characteristics;
- outline measures to minimise potential adverse effects of the project and enhance benefits to the community and local businesses and industry.

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). The project 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 National Electricity Market (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.

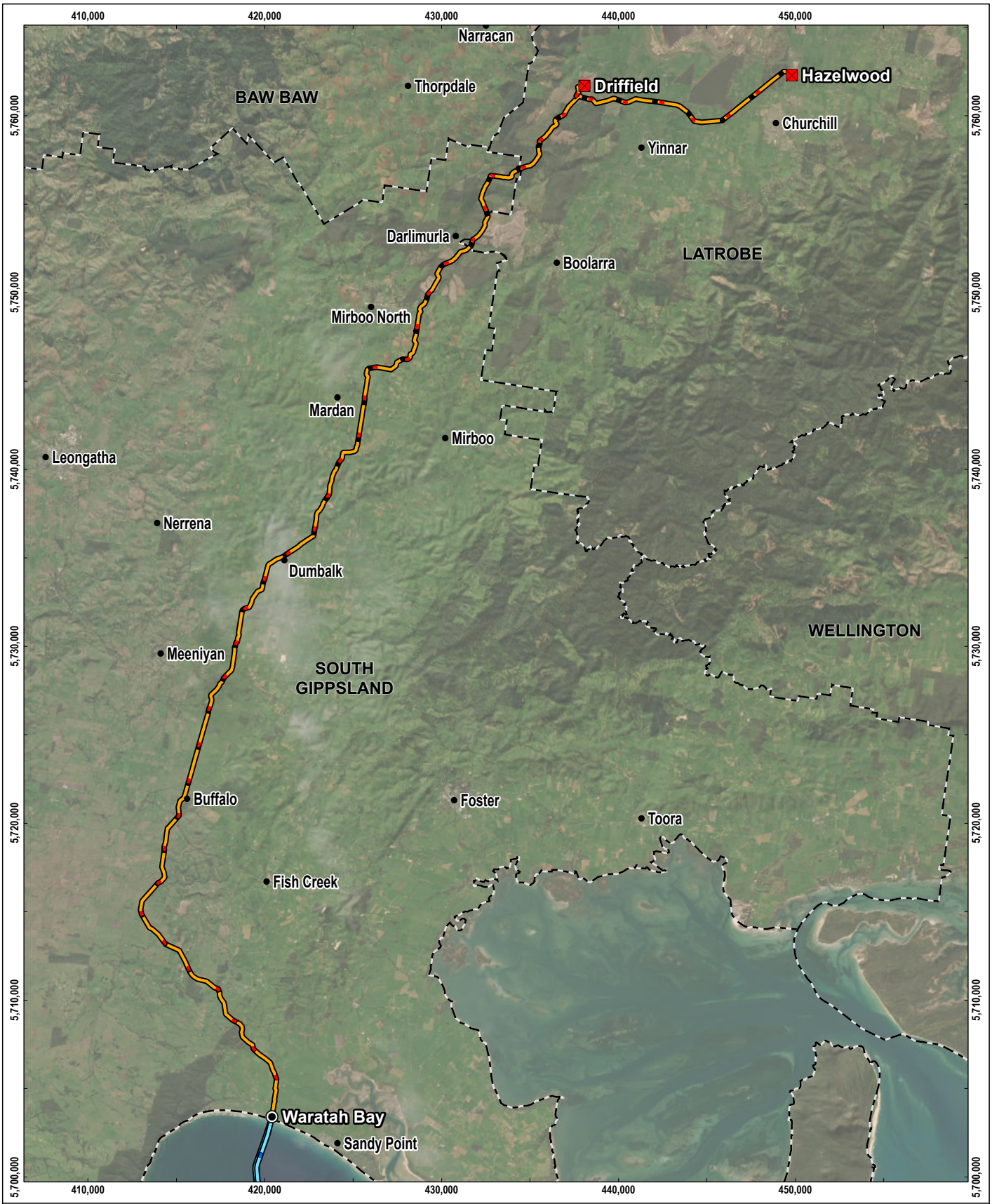
Tasmania's existing and potential renewable resources are a valuable source of dispatchable generation that could benefit electricity supply in the NEM. The project will allow for the continued trading, transmission and distribution of electricity within the NEM. It will also manage the risk to Tasmania of a single interconnector across the Bass Strait and complement existing and future interconnectors on mainland Australia. The project 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

The Gippsland region where the project is located has large agriculture and forestry industries which are of high importance to the South Gippsland Shire Council and Latrobe City Council. From the proposed landfall at Waratah Bay to the proposed converter station site at Driffield or Hazelwood the project corridor crosses a range of agricultural enterprises including dairy, beef, cropping, mixed grazing, horses and forestry.

In assessing the potential impacts, it is important to understand the existing and planned agricultural and forestry activities and practices. This includes understanding existing farm and plantation management practices and their ability to accommodate changes. Understanding how the project would impact agricultural and forestry practices is important to inform the overall impact on the industry and region. This will inform the development of effective and appropriate environmental performance requirements (EPRs) to minimise or manage impacts during construction, operation and decommissioning of the project.



LEGEND

- Landfall
- Converter station

Proposed route

- Underground HVDC cable
- HVDC subsea cable
- Local government area boundary

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0 3 6 km

SCALE **1:300,000**
PAGE SIZE: **A4**
PROJECTION: **GDA2020 MGA Zone 55**

SOURCE
Proposed route from Tetra Tech Coffey.
LGA boundaries from VICMAP.
Imagery from ESRI Online.

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AGRICULTURE AND FORESTRY

FIGURE 1-1

Project overview

TETRA TECH COFFEY

DATE: **17.05.24** PROJECT: **754-MELEN215878ML** FILE: **215878ML_AG_F01-01_GIS**

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2. ASSESSMENT GUIDELINES

This section outlines the assessment guidelines relevant to agriculture and forestry and the linkages to other EIS/EES technical assessments. 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 will report will use the term EIS/EES going forward.

This technical report applies to potential impacts on agriculture and forestry in Victoria only.

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)'.

These Commonwealth guidelines do not provide any specific scoping guidelines relevant to agriculture or forestry and therefore will not be further discussed in this report.

2.2 VICTORIA

The *Scoping Requirements for the Marinus Link Project Environment Effects Statement* issued by the Minister for Planning (February 2023) outline the specific matters to be assessed across a number 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 EES evaluation objective

The EES evaluation objective relevant to this agriculture and forestry assessment is:

Avoid and, where avoidance is not possible, minimise adverse effects on agriculture, forestry and other land uses, social fabric of communities, and local infrastructure, businesses and tourism.

2.2.2 EES scoping requirements

The relevant sections of the EES scoping requirements that this assessment has addressed are summarised in Table 2-1.

Table 2-1 EES scoping requirements relevant to agriculture

Aspects to be assessed	Scoping requirement	Report section
Key issues	Potential interaction with and interruption to agricultural and forestry activities and infrastructure such as stock lanes, irrigation, water supply, access, fencing, electricity supply and drainage	Section 8 and 9
	Loss of productive land either due to loss of access or via soil disturbance, easements, construction traffic and poor reinstatement of land after construction	Section 8 and 9

Aspects to be assessed	Scoping requirement	Report section
	Potential economic and social effects from the project, such as through disruption of business, industry (including agriculture, forestry and fisheries) or tourism	Section 8 and 9
	Biosecurity issues relating to the transfer of plant and animal diseases and weed seeds between properties e.g., *Phytophthora cinnamomi*, Johne's disease	Section 8 and 9
	Engagement with landowners and land managers	Section 6
Existing environment	Describe agricultural and primary production enterprises and practices (for instance use of large-scale equipment, prevalence of specialised production in the area, any key harvest and processing times)	Section 6
	Describe the local community and social setting, including community services and facilities, recreational activities, businesses and industry within the area, such as agriculture, forestry, shipping and fisheries	Section 6
Likely effects	Assess potential long and short-term effects from the project on existing and potential public infrastructure and land uses, including agricultural land use and associated businesses, taking into account interruption to agricultural practices, loss of productive land, biosecurity, water supply, access, drainage, and any other issues identified through the assessments	Section 8
	Assess potential economic effects of the project, considering direct and indirect consequences on employment, local and regional economy and industries in the area, including agriculture, forestry, shipping and fisheries	Section 8
Mitigation	Demonstrate whether the project is consistent with relevant planning scheme provisions and other relevant policies	Section 3.3 and 10
	Outline measures to minimise potential adverse effects of the project and enhance benefits to the community, businesses, industry and land uses	Section 8
	Describe approach to engaging with individual landowners during design, construction and operation to minimise disruption to landowner activities	Section 6.4 and 8

2.3 LINKAGES TO OTHER TECHNICAL STUDIES

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

Table 2-2 Linkages to other technical reports

Technical assessment	Relevance to this assessment
Technical appendix S: **Land use and planning**	The land use and planning technical study addresses potential impacts to land uses (including agriculture and forestry) in the context of wider planning provisions. The land use and planning technical study has informed the review of existing land uses along the project corridor.
Technical appendix A: **Electromagnetic fields (EMF)**	The EMF technical study considers potential marine and terrestrial sediment warming resulting from cable operations, and potential impacts on livestock electronic ear tags, and electronic leg bands and neck collars. Information from the EMF technical study has informed the assessment of impacts to agriculture during operation.
Technical appendix B: **Economics**	The economics technical study addresses potential financial impacts on the region considering existing businesses, including agriculture and forestry. This agriculture and forestry technical report will inform the economics technical study.
Technical appendix M: Bushfire	The Bushfire assessment addressed the risk of bushfire occurring across the project alignment. It considers different level of bushfire risk across the alignment and ability to manage a fire. The Bushfire assessment includes EPRs which are directly relevant to managing risk to forestry.
Technical appendix W: **Traffic and transport**	The traffic and transport technical study outlines that there would be an increase in construction traffic on local rural roads during the construction period and no road closures are planned for the project. Information from the traffic and transport technical study has informed the assessment of impacts to access arrangements for agricultural properties during project construction.
Technical appendix U: **Social**	The social technical study will consider project impacts and benefits on the community and social fabric. This agriculture and forestry technical study will inform the social technical study.

3. LEGISLATION, POLICY AND GUIDELINES

There is a range of key legislation, policy, and guidelines relevant to this agriculture and forestry assessment. A summary of these key legislation, policy, and guidelines is provided in this technical report.

3.1 COMMONWEALTH LEGISLATION

Key Commonwealth legislation relevant to this agriculture and forestry technical report is listed in Table 3-1.

Table 3-1 Key Commonwealth legislation relevant to the agriculture and forestry technical report

Legislation	Relevance to this technical report
Biosecurity Act 2015 (Cwlth)	The Act manages biosecurity risks in Australia. It covers the management of diseases and pests that may cause harm to human, animal or plant health or the environment.

3.2 VICTORIAN LEGISLATION

Key Victorian legislation relevant to this agriculture and forestry technical report is listed in Table 3-2.

Table 3-2 Key Victorian legislation relevant to the agriculture and forestry technical report

Legislation	Relevance to this technical report
Agricultural and Veterinary Chemicals (Control of Use) Act 1992 (Vic)	The Act imposes controls in relation to the use, application and sale of agvet chemicals, fertilisers and stock foods in Victoria.
Agricultural and Veterinary Chemicals Act 1994 (Vic)	The Act applies certain laws of the Commonwealth relating to agricultural and veterinary chemical products as laws of Victoria.
Biological Control Act 1986 (Vic)	The Act makes provision for the biological control of pests in Victoria.
Catchment and Land Protection Act 1994 (Vic)	The Act sets up a framework for the integrated management and protection of catchments, encourages community participation in managing land and water resources, and sets up a system of controls on noxious weeds and pest animals.
Conservation, Forests and Lands Act 1987 (Vic)	The Act provides a framework for a land management system and establishes a system of land management co-operative agreements.
Dairy Act 2000 (Vic)	The Act removes price and supply controls on milk, provides a licensing system for the dairy industry and enables Codes of Practice and food safety programs to be implemented in relation to dairy food.
Land Acquisition and Compensation Act 1986 (Vic)	The Act establishes the procedure for acquiring land and easements for public processes and for the determination of compensation.

Legislation	Relevance to this technical report
Livestock Disease Control Act 1994 (Vic)	The Act provides for the prevention, monitoring and control of livestock diseases and provides compensation for losses caused by certain livestock diseases.
Livestock Management Act 2010 (Vic)	The Act regulates livestock management diseases in Victoria.
Plant Biosecurity Act 2010 (Vic)	The Act obliges landholders to manage biosecurity risks. Where landholders refuse or are unable to do so, Agriculture Victoria will take action to control the biosecurity risk, at the landholder's expense.
Victorian Plantations Corporation Act 1993 (Vic)	Part of HVP Plantations' Thorpdale Plantation is on land vested in the Victorian Plantations Corporation.

3.3 POLICY AND GUIDELINES

A number of key policies and guidelines are relevant to the project and the study area.

3.3.1 The Farm Biosecurity Program

The program is a Commonwealth level joint initiative between Animal Health Australia and Plant Health Australia, helping agricultural producers to reduce the risks of diseases, pests and weeds on their crops and livestock. It encourages producers to identify relevant risks to their crops and livestock and advises as to on-farm biosecurity measures.

3.3.2 Agriculture Strategy

The agriculture strategy is a ten-year (2020 – 2030) initiative to 'Recover, Grow, Modernise, Protect and Promote' Victoria's agriculture sector, and by 2030, make the State Australia's agriculture exports centre.

3.3.3 South Gippsland Planning Scheme (2022)

The Southern Gippsland region is predominantly an agricultural region, with agriculture accounting for 30% of individual businesses (Growing Southern Gippsland 2022). As a result, South Gippsland Shire places high importance on agriculture and this is reflected in its municipal strategic statement and local planning policy.

3.3.3.1 Clause 02.03-4 Municipal Strategic Statement – Natural resource management – Agriculture

Council seeks to maintain a viable and sustainable agricultural economy as the cornerstone to the Shire's economy and future wellbeing by:

1. Protecting high quality agricultural land for primary production.
2. Promote agricultural land management that includes sustainable integration of economic and environmental needs.

3.3.3.2 Clause 14.01-1S Planning policy framework – Protection of agricultural land

To protect the state's agricultural base by preserving productive farmland.

1. Avoid permanent removal of productive agricultural land from the state's agricultural base without consideration of the economic importance of the land for the agricultural production and processing sectors.
2. Protect productive agricultural land from unplanned loss due to permanent changes in land use.
3. In considering a proposal to use, subdivide or develop agricultural land, consider the:
    a. Desirability and impacts of removing the land from primary production, given its agricultural productivity.
    b. Impacts on the continuation of primary production on adjacent land, with particular regard to land values and the viability of infrastructure for such production.
    c. Compatibility between the proposed or likely development and the existing use of the surrounding land.
    d. The potential impacts of land use and development on the spread of plant and animal pests from areas of known infestation into agricultural areas.
    e. Land capability.

3.3.3.3 Clause 14.01-3S Planning policy framework – Forestry and timber production

1. To facilitate the establishment, management and harvesting of plantations and the harvesting of timber from native forests. Ensure protection of water quality and soil.
2. Ensure Victoria's greenhouse sinks are protected and enhanced by controlling land clearing, containing the growth of urban areas and supporting revegetation programs.

3.3.4 Latrobe City Planning Scheme (2022)

Latrobe is the population and regional service centre for Gippsland, and one of Victoria's strongest regional economies. It has a large forestry and agriculture industries, with the latter based primarily on dairy and livestock.

3.3.5 Ordinance 02.03-4

Planning for agriculture seeks to:

1. Enhance the viability of agricultural activity.

3.3.5.1 Ordinance 14.01-1S

To protect the state's agricultural base by preserving productive farmland.

1. Avoid permanent removal of productive agricultural land from the state's agricultural base without consideration of the economic importance of the land for the agricultural production and processing sectors.
2. Protect productive agricultural land from unplanned loss due to permanent changes in land use.
3. In considering a proposal to use, subdivide or develop agricultural land, consider the:
    a. Desirability and impacts of removing the land from primary production, given its agricultural productivity.
    b. Impacts on the continuation of primary production on adjacent land, with particular regard to land values and the viability of infrastructure for such production.

c. Compatibility between the proposed or likely development and the existing use of the surrounding land.

d. The potential impacts of land use and development on the spread of plant and animal pests from areas of known infestation into agricultural areas.

e. Land capability.

3.3.5.2 Ordinance 14.01-3L

Avoid non-agricultural uses from locating or developing in a manner that will inhibit the expansion or operation of forestry uses.

3.3.6 Victorian Forestry Plan

The Victorian Government's Victorian Forestry Plan aims to assist the native timber industry as it manages its gradual transition away from native forest harvesting to plantation timber. The industry is transitioning due to a decrease in available native timber resources because of fire, wildlife protection and changing consumer preferences.

This is of relevance to this agriculture and forestry technical report because plantation timber will become an increasingly important resource, with impacts on plantations having potential implications for wood flow, available resource and timber products.

Commercial native timber harvesting in State forests will end by 1 January 2024.

4. PROJECT DESCRIPTION

4.1 OVERVIEW

The project 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 750MW circuits will 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 manufacturers or substantially different cable technologies adopted for the land and subsea cables. The location of the transition station will also house the fibre optic transition 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.

In Victoria, the shore crossing is proposed to be located at Waratah Bay with the route 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 route 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 will 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 36m construction area will be required for the HDD crossings.

The assessment 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 (see Figure 4-1).

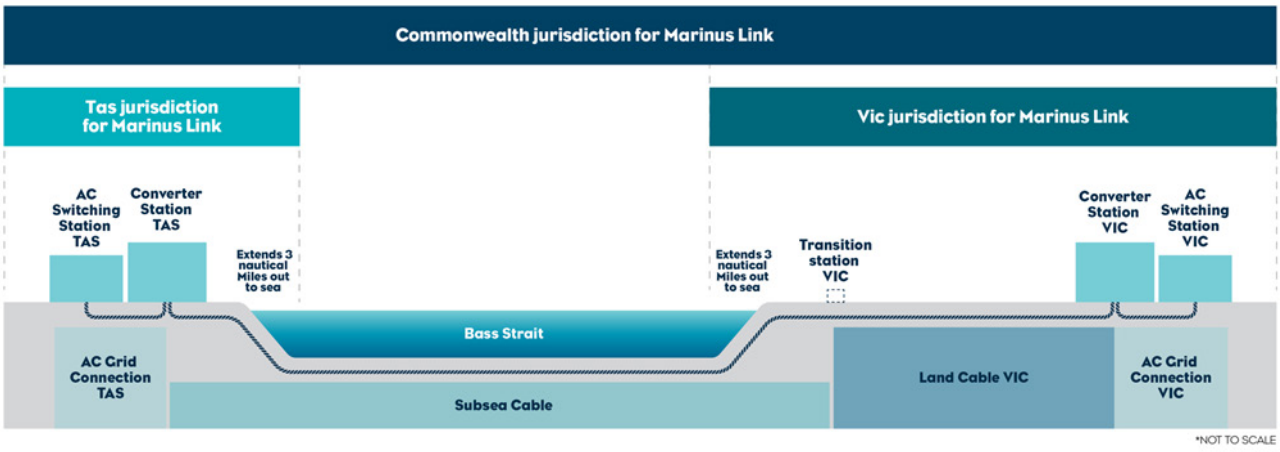

Figure 4-1 Project components considered under applicable jurisdictions

The project 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 one of the project is expected to be operational by 2030 and stage two will follow with final timing to be determined by market demand. The project will be designed for an operational life of at least 40 years.

Stage 1 and stage 2 land cable installation activities are anticipated to occur concurrently. This is generally preferable in environmental terms as ground disturbance is restricted to one impact, after which regeneration can commence.

4.2 CONSTRUCTION

Construction activities that are relevant for assessing the impact on agricultural practices and values include shore crossing construction using HDD, transition station construction, land cables installation, and converter station 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 Horizontal Directional Drilling (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 2 will be undertaken once a notice to proceed is issued by MLPL, which will depend on market conditions as well as other external factors. Ideally the commissioning data of stage 1 and stage 2 are not more than 2 years apart.

4.2.1 Transition station

The area of disturbance (AOD) for construction of the transition station is 75 m by 50 m. An engineered site bench of approximately 3,750 m^2 is required to provide a stable base for the transition station. It is assumed approximately 750 mm of soil (including 350 mm of topsoil) will need to be excavated to reach suitable ground on which the bench will be constructed. It is assumed some of the excavated material will be reused on site for landscaping, however some will need to be transported and disposed offsite if not wanted by the landowner.

The haul road to access the transition station from Waratah Road and the transition station itself will be fenced.

4.2.2 Land cables

The AOD for the land cables comprises a nominally 36 m wide (minimum 20 m wide) construction corridor that will comprise two trenches, a haul road, surface water runoff management structures, and topsoil and subsoil stockpiles. The construction corridor will also encompass cable joint pit construction workspaces.

In addition, the AOD includes:

- up to 10 m wide area for access tracks to allow track formation, table drains and batters or cuttings where required.
- HDD drill pads (entry and exit) of 60 m by 60 m where this can be accommodated without impacting on native vegetation, watercourses and other features or infrastructure, with a minimum of 40 m by 40 m for where HDD is used for crossing major watercourses, major roads, railways, avoiding vegetation and third-party crossings.
- HDD drill pad and cable joint pit access track AOD will be up to 10 m wide with a preference to use or upgrade existing farm and plantation access tracks and roads where practicable. The 10 m wide areas of disturbance will accommodate the 3-4 m wide access track and if required, area for construction of access tracks.
- laydown areas up to 1 ha at strategic locations along the route in Victoria. Seven major laydown areas approximately 13 km apart have been identified along the route. The laydown areas are on properties traversed by the proposed route or adjacent to the proposed route. The laydown areas will accommodate materials, spare parts, parking, a site office and amenities. Amenities will also be provided at cable joint pits.

Some access tracks and fences will be retained between stage 1 and stage 2 construction works. Unless agreed with the landowner/land manager to retain access roads, temporary haul roads and access tracks will be removed.

Minor laydown areas to support cable pulling operations will be located at approximately every second cable joint pit within the 20 m to 36 m wide construction corridor. These will be complemented, where needed, by smaller areas where the construction corridor needs to be reduced resulting in stockpiling of materials elsewhere.

Trenches will be backfilled with subsoil and topsoil to reinstate soil horizons and reinstatement of the construction corridor, except at cable joint pits and where equipment (e.g., caterpuller) is required to assist cable installation, e.g., at bends and HDD crossings. Following the pulling of land cables through the conduits between adjacent cable joint pits and cable jointing, the cable joint pits will be backfilled, and workspace reinstated and rehabilitated.

4.2.3 Converter station

The AOD is approximately 35 ha for the Victoria converter station site (6 ha for primary infrastructure, plus additional areas for temporary laydown, stormwater management, bushfire protection zone, landscaping, etc). It is anticipated that all works for the converter stations will be contained within the converter station sites. If a separate laydown area is required, the most suitable ones out of the seven major laydown areas, will be used.

Works will include the following:

- site clearing of vegetation, including fire perimeter;
- installation of perimeter fire trail and temporary access track;
- civil works to level the site using a balance of cut and fill with some import and installation of site access to the Strzelecki Highway at the Driffield site and Tramway Road at the Hazelwood site;
- civil works to install site drainage and stormwater management and internal roads;
- installation of foundations;
- erection of structures.

4.3 OPERATION

Aspects of the project operation of relevance to agriculture and forestry relate to the 20 m easement and associated restrictions on land titles, and ongoing maintenance activities.

The transition station at Waratah Bay will not require staff on site, and during normal operations, the site will be monitored remotely. There will be regular inspections of buildings and maintenance for weeds and drainage.

Easement conditions on land titles set out restrictions for activities on an easement. Most farming and cropping activities will be able to continue, however some activities will be conditional or prohibited within the easement and within immediate proximity due to safety, access and the cables technical requirements. A summary of the permitted and restricted uses along the easement is summarised in Table 4-1 (Marinus Link 2021).

Table 4-1 How land can be used within the easement

Permitted	Conditional	Prohibited
Cropping (ploughing/tilling to a depth of 0.5 m)	Cropping (ploughing/tilling to a depth of 0.7 m)	Cropping (ploughing/tilling greater than a depth of 0.7 m)
Grazing	Boring for groundwater or fence posts	Planting deep-rooted trees (greater than 0.5 m)
Irrigation	Fixed centre pivot irrigation (due to the depth of foundations required for a fixed centre pivot)	Building a dam
Most domestic recreational activities	Installing driveways	Reducing or increasing ground level
Minor structures e.g., washing lines or play equipment (subject to depth limits for objects inserted into the ground)	Building temporary/light structures e.g., shelters	Constructing houses or substantial structures
Planting a garden (access may be required in the unlikely event of a cable fault)	Planning subdivisions	Storing or using explosives
Parking vehicles (height/weight restrictions may apply)	Using electric fences	Installing fixed plant or equipment e.g., galvanised sheds or swimming pools
Driving vehicles	Excavation or earthworks	Placing or storing garbage, hay, silage or fallen timber
Electronic ear tags on stock	Constructing utility services whether overhead, buried or on the surface e.g., telephone, data and water	Storing or using flammable materials. Lighting fires

In general, land cables are typically maintenance free with routine maintenance limited to several smaller activities around cable joint pits. Cable joint pits will be marked with poles and the route will be marked at all necessary property boundaries (internal and external). The converter stations will not be manned 24/7 and only attended during normal working hours. Outdoor spaces will not be lit at night unless activated by security system sensors.

The project is proposed to 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;
- servicing, testing and repair of the subsea and land cables, transition station and converter station equipment and infrastructure including scheduled minor and major outages;
- maintenance of access tracks.

4.4 DECOMMISSIONING

The operational lifespan of the project is a minimum 40 years. At this time the project will be either decommissioned or upgraded to extend its operational lifespan.

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 will 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 will be left in-situ as removal will cause significant environmental impact.

The concrete cable joint pits will be broken down to at least one metre below ground level and buried in-situ or excavated and removed. Subsea cables will 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 that was used to identify values and assess the potential impacts on agriculture and forestry from the project construction, operation and maintenance, and decommissioning activities.

5.1 STUDY AREA

The study area includes land within Victoria extending along the proposed cable alignment from Waratah Bay to Hazelwood. This report does not include the offshore marine environment.

The study area encompasses the farms and plantations through which the project is located. It is nominally 220 m wide, which will accommodate the 20 to 36 m wide construction corridor, minor laydown areas and an area of up to 10 m wide for access tracks. In some locations the study area is wider or narrower and follows property boundaries. In some instances, major laydown areas are adjacent to the 220 m survey area corridor and in some locations offset from the route. The study area includes these laydown areas, as well as the converter station sites at Driffield or Hazelwood, the HDD drill pad site at Waratah Bay and other drill pad sites along the proposed alignment, the transition station site at Waratah Bay, and up to 10 m wide access track where required.

For this report, the route has been considered in six sections based on the major soil groups, topography and agricultural types (detailed further in section 6.3.6).

These sections are:

- section 1: Waratah Bay to Fish Creek;
- section 2 Fish Creek to Dumbalk;
- section 3 Dumbalk rising to Mardan;
- section 4 Mardan to Baromi;
- section 5 Baromi to Driffield;
- section 6 Driffield to Hazelwood.

5.2 EXISTING CONDITIONS

To understand existing conditions and identify values that could be affected by the project, a desktop assessment and visits to a representative sample of affected properties were undertaken.

5.2.1 Desktop assessment

A desktop assessment including a review of baseline local government data and knowledge gained from extensive prior work across Gippsland and the Latrobe Valley was undertaken. This review included sourcing data from the Australian Bureau of Statistics, strategies published by the local Councils, and published studies about the activities and productivity of the Gippsland agricultural region.

5.2.2 Property visits

During July and August 2022, arrangements were made for property visits to be undertaken at a representative sample of properties impacted by the project. Twenty-three properties were identified as being representative of the agricultural enterprises and farming practices along the Victorian route.

Landowners were approached by MLPL land agents about being interviewed on their farming practices and potential impacts on their farming activities. At the time of writing this report, the land agents had arranged property visits at 15 of the identified properties, including dairy (six visited out of a total 18 dairy farms) and

beef (eight visited out of a total 34 beef properties) properties as well as a racehorse training facility. It was not possible to arrange property visits with plantation operators.

These 15 visits, supplemented by the technical specialist's 40 years of professional experience working in the region, including with many landowners along the proposed alignment, provided sufficient knowledge about the environment, soils, climate and primary production activities to conduct the impact assessment.

Further engagement with landowners is addressed in the EPRs.

5.3 IMPACT ASSESSMENT

This agriculture and forestry technical report assesses the significance of impacts by considering the sensitivity of the value and magnitude of the impact.

The benefit of the significance approach is that it enables an understanding of the sensitivity of farming and forestry practices to disturbance and how well they will respond and adapt to changes if required.

5.3.1 Sensitivity criteria

The criteria for determining sensitivity are set out in Table 5-1.

Table 5-1 Criteria for determining sensitivity

Sensitivity level	Criteria
Very high sensitivity	Very high quality agricultural or forestry land protected by statutory planning controls, e.g., schedule to the Farming Zone protecting high quality agricultural land or strategic cropping land.
	Very high fodder and water requirements, supplementary feed in autumn and winter and during dry summers.
	Very high quality agricultural or forestry land based on soil type, rainfall, slope and drainage. High carrying capacity or high crop yields per hectare.
	Niche agricultural enterprise catering for a niche market, e.g., cut flowers.
	Intensively farmed land with substantial infrastructure, e.g., vineyard, orchard.
	In a declared biosecurity quarantine area.
	Shallow fragile soils with poorly defined soil horizons that are highly susceptible to disturbance with high potential for compromised soil structure, soil moisture content and reduced fertility.
	Committed farm or plantation development plans to maximise productivity and yield or diversify the business requiring significant investment may not be approved.
High sensitivity	High quality agricultural or forestry land protected by statutory planning controls, e.g., high quality agricultural land or strategic cropping overlay.
	High fodder and water requirements, supplementary feed in autumn and winter and during dry summers.
	High quality agricultural or forestry land based on soil type, rainfall, slope and drainage. High carrying capacity or high crop yields per hectare.

Sensitivity level	Criteria
	Intensively farmed land with dairy cattle cell grazing or horticultural crops with or without irrigation.
	Farming practices or produce subject to biosecurity controls, e.g., organic or biodynamic farms, seed potato growing.
	Shallow soils with poorly defined soil horizons that are highly susceptible to disturbance with potential for compromised soil structure, soil moisture content and reduced fertility.
	Proposed farm or plantation development plans to maximise productivity and yield or diversify the business requiring significant investment may be comprised by the project.
Moderate sensitivity	Moderate quality agricultural or forestry land based on soil type, rainfall, slope and drainage. Moderate carrying capacity or crop yields per hectare.
	Moderate fodder and water requirements, occasional supplementary feed in autumn and winter and during dry summers.
	Beef cattle or horse studs with substantial infrastructure.
	Not in a declared biosecurity quarantine area but farming activities subject to standard biosecurity controls.
	Soils with defined soil horizons that when disturbed may compromise soil structure, soil moisture content and reduced fertility.
	Proposed farm or plantation development plans to maximise productivity and yield or diversify the business requiring modest investment may be comprised by the project.
Low sensitivity	Low quality agricultural or forestry land based on rainfall, soil type, slope and drainage. Low carrying capacity or crop yields per hectare.
	Low fodder and water requirements, minor amounts of imported supplementary fodder in autumn and winter and during dry summers.
	Cattle, sheep or goat grazing with or without hay production.
	Not in a declared biosecurity quarantine area or subject to biosecurity controls.
	Robust soils with well-defined soil horizons that recover from disturbance without compromised soil structure, soil moisture content and reduced fertility.
	Potential farm or plantation development plans to maximise productivity and yield or diversify the business may be comprised by the project.
Very low sensitivity	Very low quality agricultural or forestry land based on soil type, rainfall, slope and drainage. Very low carrying capacity.
	Minimal fodder and water requirements.
	General grazing.

Sensitivity level	Criteria
	Not in a declared biosecurity quarantine area or subject to biosecurity controls.
	Deep robust soils with well-defined soil horizons that quickly recover from disturbance without compromised soil structure, soil moisture content and reduced fertility.
	No farm or plantation development plans.

5.3.2 Magnitude criteria

The criteria for determining magnitude are set out in Table 5-2.

Table 5-2 Criteria for determining magnitude

Magnitude level	Criteria
Severe	Farming or forestry practices significantly affected necessitating new practices. Farm or forestry infrastructure significantly affected necessitating major investment to reconfigure farm or plantation. Farm productivity and yield significantly reduced long term. Multiple coupes in plantation permanently removed from production significantly affecting wood stock and wood flow from plantation. Soil structure, soil moisture content and fertility significantly affected reducing productivity across the farm or plantation. Dust emissions and deposition significantly affect amenity or productivity or yield. Biosecurity quarantine or controls breached leading to destocking and loss of market share or noxious weed infestation significantly degrading pastures or crops or loss of trees from infection by plant pathogen throughout property requiring significant investment and effort to control. Committed farm or plantation development plans significantly affected reducing capacity to maximise productivity and yield or diversify the business.
Major	Farming or forestry practices affected necessitating substantially modified practices. Farm or forestry infrastructure affected necessitating investment to reconfigure parts of the farm or plantation. Farm productivity and yield reduced but recoverable over five years. One to three coupes in plantation permanently removed from production affecting wood stock and wood flow from plantation. Soil structure, soil moisture content and fertility affected reducing productivity from parts of the farm or plantation. Dust emissions and deposition significantly affect amenity or reduce productivity or yield. Biosecurity controls breached leading to temporary destocking or product batches or stock being rejected, or noxious weed infestation degrading pastures or crops

Magnitude level	Criteria
	throughout property, requiring significant effort and investment over short term to control. Proposed farm or plantation development plans affected limiting potential to maximise production and yield or diversify the business requiring alternative less attractive investment opportunities to be considered.
Moderate	Farming practices temporarily affected requiring temporary arrangements including, for example, agistment or supplementary feeding. Forestry practices affected requiring modified practices.. Farm or forestry infrastructure affected necessitating temporary arrangements. Farm productivity and yield reduced but recovered within two years. Large parts of coupes permanently removed from production or rendered uneconomic (including pre-mature harvesting of plantation coupes) affecting wood stock and wood flow from plantation. Soil structure, soil moisture content and fertility affected but recover following rehabilitation. Dust emissions and deposition reduce amenity, productivity, or yield. Biosecurity controls breached leading to product batches or stock being rejected or noxious weed infestation degrading pastures or crops in one or more paddocks, and controllable with moderate effort and investment. Biosecurity controls breached leading to pre-mature clearing and isolation of part of plantation coupe to limit spread of plant pathogen. Proposed farm or plantation development plans affected requiring alternative investment opportunities to be considered.
Minor	Farming practices temporarily affected requiring alternative on-farm arrangements. Forestry practices temporarily affected requiring alternative access, harvesting and management arrangements. Farm or forestry infrastructure affected but reinstated shortly after disturbance. Farm productivity and yield temporarily affected but recovered within one to two years. Small parts of coupes permanently removed from production and uneconomic slivers created affecting wood stock and wood flow from plantation. Soil structure, soil moisture content and fertility affected but quickly recover following rehabilitation. Dust emissions and deposition cause nuisance for extended periods but do not affect productivity or yield. Biosecurity controls not breached or noxious weed infestation isolated to discrete patches and easily controlled with minor effort and investment. Potential farm or plantation development plans unaffected.

Magnitude level	Criteria
Negligible	Farming or forestry practices temporarily disrupted but do not require changes. Trees along edges of couples permanently lost from production with minor impact on wood stock or wood flow from plantation. Farm or forestry infrastructure not affected. Farm productivity and yield not affected. Soil structure, soil moisture content and fertility not affected with fertility quickly re-established following rehabilitation. Dust emissions and deposition cause temporary nuisance but do not affect productivity or yield. Biosecurity controls not breached and no noxious weeds infestations. Potential farm or plantation development plans unaffected.

5.3.3 Assessment of significance

The matrix used to determine significance, considering the sensitivity of the value and magnitude of the impact is set out in Table 5-3.

Table 5-3 Matrix for determining significance

Magnitude of impact	Sensitivity of value				
	Very high	High	Moderate	Low	Very low
Severe	Major	Major	Major	High	Moderate
Major	Major	Major	High	Moderate	Low
Moderate	High	High	Moderate	Low	Low
Minor	Moderate	Moderate	Low	Low	Very low
Negligible	Moderate	Low	Low	Very low	Very low

A description of the significance of an impact derived using Table 5-3 and is set out in Table 5-4.

Table 5-4 Significance of impact descriptions

Significance of impact	Description
Major	Productivity or yield significantly affected, reducing farm income long term (up to 10 years) and loss of market share. Wood stock and flow significantly affected, reducing plantation income long term and loss of wood supply contracts. Farm or plantation placed in quarantine.

Significance of impact	Description
	Farm or plantation development plans unable to be implemented significantly increasing costs or necessitating diversifying into less profitable farming activity.
High	Productivity or yield significantly affected, reducing farm income and market share medium to long term (up to five years). Wood stock and flow significantly affected, reducing plantation income and ability to meet wood supply contracts. Significant investment required to maintain productivity or yield.
Moderate	Productivity or yield affected, reducing farm income and market share medium term (two to five years). Moderate investment required to maintain productivity or yield. Wood stock and flow affected, reducing plantation income and necessitating more costly alternative wood supply arrangements.
Low	Productivity or yield temporarily affected, reducing farm income short term (one to two years). Minor investment required to maintain productivity or yield. Wood stock and flow affected due to value being reduced by pre-mature harvesting.
Very low	Productivity or yield not affected with farm income and market share maintained. Wood stock and flow not affected. Short term, temporary disruption does not adversely affect farming or forestry practices or increase costs.

5.3.4 Application of EPRs

Environmental performance requirements (EPRs) set out the environmental outcomes that must be achieved during pre-construction, construction, operation, and decommissioning of the project. Compliance with EPRs is intended to minimise impacts to within reasonable limits having regard to contextual factors and the practical delivery of the project.

This performance-based approach allows for flexibility in how a specified outcome is achieved, rather than providing prescriptive measures that must be employed. Example mitigation and management measures which explain how EPRs could be complied with have been discussed in the impact assessment.

5.3.5 Assessment of residual impacts

Residual impacts are potential impacts remaining after the application of EPRs.

The extent to which potential impacts have been reduced is determined by undertaking an assessment of the significance of residual impacts. This is a measure of the effectiveness of the EPRs, considering the possible approaches for management and mitigation to reduce the magnitude of the potential impacts as the sensitivity of the value generally does not change.

If proposed EPRs are ineffective in reducing the significance of residual impacts to moderate or less than moderate, additional EPRs or example mitigation and management measures will be developed.

6. EXISTING CONDITIONS

Agriculture in the Southern Gippsland region of Victoria contributes to over $2 billion in gross regional product per year (RMIT 2019). Eighty percent of the agricultural produce in this region is supplied from beef, dairy and horticulture.

The Australian Bureau of Statistics provides that in the financial year ending 30 June 2021 the total gross value of agricultural production for the South Gippsland Shire was $652.5 million, with crop total gross value at $81.2 million and livestock processing total gross value of $257.1 million (ABS 2021a).

The Australian Bureau of Statistics provides that in the financial year ending 30 June 2021 the total gross value of agricultural production for the Latrobe City local government area was $62.2 million, with crop total gross value at $6.5 million and livestock processing total gross value of $33.2 million (ABS 2021b).

This section describes the existing agricultural practices and conditions relevant to these practice within the study area.

6.1 KEY LANDOWNER ISSUES

Most landowners in the project area have not been exposed to major linear infrastructure projects, with perhaps the exception of a Telstra fibre-optic and phone cables being their only experience.

To understand landowner issues and concerns regarding impacts on their agricultural production activities a sample of those landowners farming within each form of agricultural production system were consulted regarding their farming business, potential impacts, and concerns they may have (for both the short and long term) on their agricultural production activities.

Consultation comprised on-farm meetings, follow-up phone calls to clarify issues, and information shared in further meetings.

Biosecurity was a key landowner concern. This was acknowledged by the author by implementing a standard procedure that involved the author stepping into a disinfectant foot-bath pre- and post-visit in full view of the landowner, lessee or operator. This was commented on and appreciated by the people visited.

Further standard procedures included maintaining an informal approach from the start and avoiding taking copious notes early in the visit. Initially discussing activities on the farm, the location where the project would be passing through their property, followed by discussion about their broader farm business. Sometimes follow up phone communications, or visit were required. No discussion at any time took place regarding their neighbours, or any other farm business along the route that had been or might be visited.

Meetings took place in machinery or hay sheds, out on the farm, at the house on the back veranda, often ending up in the kitchen over a coffee. In some cases the meetings were the first opportunity for landowners to discuss their issues associated with their farming activities, farm plans for the future and more general concerns regarding their farm viability and product markets after construction was completed. Landowners who had or were engaging with MLPL (land agents, route selection specialist and project team members) were better informed about the proposed development, construction activities, and operation and maintenance activities than landowners who were yet to engage.

Landowners who have been prepared to enter into discussions in the early planning phase have found that engagement has led to a better understanding of the project, minimising impacts on their farms and farm businesses. For example, landowners have benefited greatly from discussing underground project alignment realignment options, with some requesting several visits to address concerns identified through a better understanding of what is proposed and how it will be constructed and operated.

By comparison, in cases where landholders have been reluctant to discuss the proposed project, the learnings from engagement with other landowners have been incorporated and applied where appropriate. However, the author noted that only through direct engagement with landholders are any property specific issues able to be fully identified and addressed.

The MLPL public meetings for landowners also enabled discussion to address route selection and potential impacts on agricultural production activities.

On farm meetings with the route selection specialist have resulted in some issues being resolved. Examples of potential agricultural production issues that have been resolved after discussions with landowners include:

- A section of the proposed easement running parallel to a boundary line and Landcare shelter belt was moved further away from the trees at the request of the landowner to ensure tree roots were not impacted.
- A section of the proposed easement was diverted to grazing paddocks on the opposite side of a road so that it was not interfering with a proposed farm infrastructure, which has subsequently been constructed and is now in use.

Examples of issues commented on by landowners that must be considered in designing, constructing and operating the project include but are not limited to:

- Avoiding attempting to make contact at inappropriate times – always make appointments, as landowner priorities will be different to the project's priorities; remembering that the farm also includes the residential home (24-7) for the farm operator and their family.
- Assessing existing landforms, with particular attention to steepness of slopes. Avoid creating erosion 'hot-spots' during construction, i.e., trenching work and by equipment/vehicles tracking along the construction corridor.
- Avoiding creating erosion hazards in other areas of the property during construction, particularly on internal roads, tracks and construction corridor crossing points, requiring immediate repair with a suitable backfill material (informed by landowner preference) to maintain access and protect stock from hoof injury that will result in lameness.
- Communicating and staging works to account for seasonal farming activities, I.e., calving, lambing, silage and hay making, and harvesting crops.
- Managing potentially very high biosecurity risk associated with horticultural land particularly related to plant disease. Downgraded produce is unsaleable and represents a huge wastage cost.
- Maintaining a biosecurity register for the entire route is a concern to landholders.
- Protecting existing and proposed infrastructure including fences, buildings, stockyards and structures, internal roads and farm lanes, and drains carrying excess water off farms, as well as areas earmarked for development projects i.e., dams and drains.
- Monitoring and managing emergent weeds in excavated soil heaps (often referred to as spoil windrows) beside the cable trenches and at pit locations. Weed seeds can lie dormant in the soil for up to 50+ years and will include weeds not recently seen in a district for many years. Treatment in the vegetative growth phase is most effective in minimising the risk of weeds spreading on the property and throughout the district.
- Identifying and managing 'springs' and 'soaks' in consultation with landowners to manage the risk to construction and farming activities. The saturated soil below the surface can quickly collapse becoming a hazard for vehicles, plant, equipment, farm and construction workers, and stock.
- Maintaining the ability of operate farm equipment over the underground cables including in wet weather when ground conditions may result in equipment becoming bogged or leaving wet deeply rutted tracks over the cables.

Broader key issues that arose during property visits and landowner meeting follow-up conversations included:

- What are the short and long-term impacts on farm production?
- How long will construction work take?
- How long after fencing the construction corridor will it take to carry out the construction activities including reinstatement and rehabilitation?
- How long after restoration is completed will it take for production to return to previous productivity?

- What are the impacts on farm income during construction, as well as long-term impacts on future financial and farm viability?
- Will they (landowners) be adequately compensated for any losses during construction?
- How will biosecurity be managed?
- What happens if wildlife (e.g., rabbits and wombats) build a burrow into the area where the cables are buried?

From previous experience with this type of project, the above questions could be expected. Landowners prefer short answers which is often difficult due to the complexity of the project. Landowners who opted not to partake in visits undertaken to inform this impact assessment will, at the latest, be engaged when individual property management plans are being prepared (EPR A02).

6.2 LAND TENURE

Aerial photographs showing land parcels were supplied by MLPL and have been reviewed for the study area.

Within the 220 m wide survey area, there are 342 land parcels between the proposed shore crossing point at Waratah Bay and its termination at the potential Hazelwood converter station site, of which 296 are within the proposed easement (Tetra Tech Coffey, 2022).

Most of the survey area is freehold land used for agriculture and rural residential activities. Some agricultural enterprises have land holdings that are comprised of leased farms and adjacent additional purchased farms that form an addition to the home farm. Most farming operations in the survey area are family-owned. Given land holdings often include multiple land parcels, 104 freehold landholders would be affected by the proposed easement (Tetra Tech Coffey, 2022).

6.3 CLIMATE

Climatic data provided is from Bureau of Meteorology (BOM) weather stations at Foster/Yanakie, Fish Creek, Mirboo North and Traralgon.

6.3.1 Temperature

Mean maximum daily temperatures range between 20.7 and 22.8 ºC in summer, whereas winter temperatures range between 13.4 and 13.8 ºC. Autumn and spring seasons are not a major issue in agriculture production, as milder conditions present in these seasons, which provides more stability in temperature ranges and soil moisture.

Soil temperatures may reach low enough levels to retard pasture growth, i.e., less than 9 ºC some days from mid-May to early September, and low enough to limit nitrification from early June to early August.

Nitrification is the important process whereby legumes (clovers, lucerne, etc.) convert atmospheric nitrogen into a form which plants can use. It is of high importance to the grazing industries and less so for horticulture.

Wind also has an influence on plant production, in particular hot north and north-westerly winds that occur in summer have a damaging effect on plants through drying out and/or removing soil moisture.

6.3.2 Rainfall

January through to early March is typically the driest period in Gippsland. In most years, rainfall is lowest and evaporation highest during these months and therefore limits plant growth.

Effective rainfall occurs during the period late March to December. Table 6-1 shows mean monthly rainfall in the study area.

Table 6-1 Mean monthly rainfall (mm) across the study area (BOM, 2022)

	Foster/Yanakie	Fish Creek	Mirboo North	Traralgon
January	61.2	56.0	55.8	48.0
February	55.8	51.5	54.9	51.8
March	75.5	67.4	71.2	55.1
April	93.7	86.8	82.4	55.5
May	103.5	103.7	94.4	64.3
June	111.5	104.0	97.5	67.9
July	106.2	103.6	94.4	62.9
August	116.2	111.5	105.8	71.1
September	108.1	94.1	104.9	70.8
October	103.2	93.6	95.2	79.4
November	85.1	84.4	83.2	67.0
December	75.9	66.9	75.1	62.9

6.3.3 Frosts

Occurrence of frosts depends very much on local conditions such as topography and vegetation; any data on frosts should be interpreted carefully. Sloping sites are generally less subject to frosts than valleys or depressions and the difference between nearby sites can be substantial.

During the autumn and winter seasons frosts may occur. A heavy frost is 0.0 ºC or less. When the temperature is between 0.0 and 2.2º C, conditions are equivalent to a light frost.

6.3.4 Sunlight hours

Sunlight is important to agriculture and forestry because it provides the necessary energy for plant growth. Sunlight assists photosynthesis, which is the process by which plants produce chlorophyll, which in turn produces sugar and starch from carbon dioxide and water in the air.

Provided that plants are adequately supplied with water and air, the more sunlight hours per day (see Table 6-2) the greater the plant production.

Table 6-2 Average hours of sunlight per day per month across the study area

	Foster/Yanakie	Fish Creek	Mirboo North	Traralgon
January	9	9	9	9
February	8	8	8	8

March	7	7	7	7
April	6	6	6	6
May	5	5	4	4
June	4	4	4	4
July	5	5	4	4
August	5	5	5	5
September	5	5	5	5
October	6	6	6	6
November	7	7	7	8
December	8	8	8	8

6.3.5 Climatic conditions summary

The following points summarise the key climatic conditions in the study area:

- rainfall restriction for plant growth is likely from late December to April;
- there are no temperature restrictions for plant growth during any month (due to milder conditions, the impact of coastal conditions and lower altitude terrain;
- length of growing season in this area is 10 months (generally from March to December);
- the occurrence of heavy frosts during the year in lower areas between May and September;
- winter corresponds with higher rainfall, lower air temperatures and shorter daylight hours, which present growing conditions of lower productivity;
- summer corresponds with hotter and drier temperatures and lower rainfall, with the longest daylight hours.

6.3.6 Soil types within the corridor

The proposed 90 km the route from Waratah Bay to Hazelwood passes through six major soil groups. A description of these, their approximate locations and the types of agriculture they support are outlined below. High level soil mapping of the proposed alignment is provided in Appendix E to this report.

6.3.6.1 Waratah Bay to Fish Creek

Leached sandy soils that have developed on sheets of unconsolidated sandy soil, in places they are wind deposited or coarse sands that have been swept into waterborne deposits. Dark grey sands and loamy sands with some organic material in a layer up to 200 mm thick with bleached sand beneath. Some areas feature a thin layer of coffee rock with yellow sand beneath.

In the undulating areas, the rises can dry out significantly, with dissecting gullies becoming very wet in late winter to spring (see Plate 6-1). Low natural soil fertility and very acidic soils are typical (Appendix E Figure 2.1: Soils and landforms).

Agriculture through this section is primarily grazing (modified pasture) with isolated pockets of horticulture within 2 km of the proposed alignment.

Plate 6-1 Saturated soils between Waratah Bay and Fish Creek

6.3.6.2 Fish Creek to Dumbalk

Soils vary from an old flood plain, with coarse sand/gravel within 200 mm below the surface on rises, tertiary sediments rising to medium clays on the undulating hills, very wet in winter-spring with loss of structure in the subsoil, then drying out and becoming hard setting in summer-autumn. These soils are strongly acidic and have a low natural nutrient status. Deep drains have enabled this area to be developed for more intensive farming.

Agriculture is mainly grazing (modified pasture), with a slight increase in the amount of horticulture with increasing proximity to Mardan.

Plate 6-2 shows the location of the proposed route (near the middle of the photo, from left to right) near Buffalo. The drainage line marks a change in soil types, with flats (Leongatha South) on the left side and rising ground (Koonwarra) on the right side (see Appendix E:). Soils are poorly drained and show surface pugging due to hoof damage.

Plate 6-2 Proposed route near Buffalo

6.3.6.3 Dumbalk rising to Mardan

A major change in soil type near Dumbalk where the land starts rising to Mardan. These yellow/brown gradational soils on the rolling hills and steeply dissected ridges of the Strzelecki's are typical of the broader hills with much of the area not tractorable at any time of the year. Aerial agriculture (planes and helicopters) are relied on for spraying herbicides and fertilisers.

These soils overlay weathering cretaceous sandstones and mudstones. At about 350 mm depth, the soils change to yellowish-brown clays or silty loams. Parent material is present at approximately one metre below the surface (Appendix E Figure 2.2: Soils and landform).

These very steep slopes (see Plate 6-3) are at high risk of land slips and erosion, often occurring in late winter through to October.

Plate 6-4 shows a view to the north across a steep, undulating southern slope. Note in the lower section of the fold there is evidence of very wet broken ground, likely over 2 m deep. These areas are prone to tunnel erosion. The same area in late summer would be dry with the subsoil hard setting.

Dairy and beef enterprises predominate the agricultural sector in the Dumbalk to Mardan section of the proposed alignment.

Plate 6-3 Steep slopes and dairying between Dumbalk and Mardan (Tetra Tech Coffey 2022)

Plate 6-4 Potential for tunnel erosion near Mardan (Tetra Tech Coffey 2022)

6.3.6.4 Mardan to Baromi

Red gradational soils derived from volcanic rock, dark brown in colour, suited to frequent cultivation, well-structured and very free draining. These soils have low water holding capacity and often dry out in summer; therefore, irrigation is required for cropping (Appendix E Figure 2.3: Soils and landforms).

Agriculture close to Mardan comprises mainly seasonal vegetables and herbs (see Plate 6-5) with some grazing. Potato growing is predominant in this section of the proposed alignment.

Plate 6-5 Horticulture between Mardan and Baromi (Tetra Tech Coffey 2022)

6.3.6.5 Baromi to Driffield

This area is a series of soil complexes (blends of co-dominant units of soil), comprising rolling low hills to undulating rises of tertiary sediments, some tertiary basalts, and rolling low hills of tertiary sediments. Soils are usually well drained, are very strongly acidic with a low natural nutrient status.

From Baromi to Driffield, agriculture is primarily hardwood and softwood forestry (see Plate 6-6).

Plate 6-6 HVP's Thorpdale plantation at Driffield (Tetra Tech Coffey 2022)

6.3.6.6 Driffield to Hazelwood

Highly fertile, grey gradational soils resulting from very old alluvial deposits are typical. Subsoils tend to be sodic, and salting can occur on lower lying sections of land. Salinity at the soil surface can occur on lower lying sections of the land. These areas of surface salinity will become larger where soil disturbance occurs, such as grading, cultivation and excavation takes place.

These soils have a high water holding capacity; dark grey clay loams merge into mottled grey and yellowish-brown heavy clays at about 350 mm depth.

From the hardwood and softwood forestry surrounding Driffield, agricultural activity returns to a mix of primarily grazing (modified pasture) with little horticulture, before shifting to hardwood plantations approximately 2 km west of Hazelwood.

A full description of soils along the proposed route is provided by the soil and landform maps in Appendix E. Four figures depicting the types of agricultural land use along the full length of the proposed alignment are provided in Appendix F:.

Plate 6-7 is a view to the east along the proposed route on the eastern side of the Morwell River flats. The proposed alignment runs up and over the hill close to the north side of the farm track. The soil type here is riverine. A feature of this location is how quickly this area can become flooded to a depth of up to 3 metres after local rain.

Plate 6-7 Proposed route near the Morwell River flats

6.4 AGRICULTURAL PRODUCTION AND FORESTRY ACTIVITIES

There are three key agricultural industries, plus an active forestry sector, operating along the project corridor; dairying, beef production and horticulture (primarily potatoes). Less prevalent but also present are racehorse training and agistment facilities.

Although intensive sheep (prime lamb and wool) production occurs in both the South Gippsland Shire and Latrobe City Council, they are not a major contributor to agricultural production and sheep properties were not identified along the proposed alignment.

The pasture feed base is uniformly a legume (mainly white clover) and grass (mainly perennial ryegrass) based sward. Visual estimates of annual pasture production are in the range of 7,800 kg of dry matter (DM) per ha to 13,400 kg of DM per ha. A critical related factor is the estimated percentage of this feed base that is consumed each year. It was estimated that between 64 % and 75 % of the annual pasture produced is consumed by dairy and beef production annually, the remaining 36 % -25 % is wasted feed mainly (trampled by stock).

Of the landowners affected by the easement, the majority (34) practice beef production. Table 6-3 summarises the number of properties, length and AOD (estimates, obtained through GIS interrogation, review of aerial photographs and the writer's personal experience in the region) for landowners affected by the easement, engaged in the main agricultural production activities identified in this report.

Horse breeding, training and spelling is limited in number (of properties) and scale (of area used) and so is not included.

The total number of properties identified in Table 6-3 is 63, which reflects the complexity in characterising/isolating landholdings to account for leased farms, formal/informal sub-divisions on family-owned properties and inclusion of Crown land (notably in the forestry sector).

Table 6-3 Main agricultural production activities practiced by landowners affected by the easement

Agricultural production activity	Number of properties	Length (kms)	AOD (ha)
Beef production	34	30.6	136.5
Dairying	18	22.4	93.8
Horticulture	3	2.4	7.8
Organic farming	2	1.1	3.8
Forestry	6	18.8	41.02

6.4.1 Dairying

Dairy farming in Victoria produces 61 % of Australia's gross milk production (Agriculture Victoria 2023a) and involves rearing dairy heifer replacement stock, agistment for rearing replacement stock and mature cows during their dry cow period.

In 2021-22 there were 343 licensed dairy farmers in the South Gippsland Shire (1,082 in Gippsland overall) which produced just under 673 million litres of milk (out of 1,944 million litres in Gippsland overall).

In the Latrobe City local government area, there are 30 dairy farms registered, producing just under 34.9 million litres of milk in 2021-22.

There are approximately 18 dairy farm businesses along the proposed route.

Further information on the Victorian dairy industry is available in Appendix A:.

6.4.1.1 Dairy farm visits

Of the approximately 18 dairy farms affected by the proposed route, a representative sample of six were visited. Three of the dairy farms also had a beef production operation and all leased additional farmland.

Farm size is variable; the largest property utilised 325 ha of 'home farm milking area' and leased the same sized area in three additional locations.

Milking herd size on properties visited ranged from 300 to 800 cows, however it can be expected that along the corridor some smaller herds (below 300 milkers) may be operating. Replacement dairy stock (approximately 28-30 % of a milking herd is replaced annually) are either reared on the farm or on nearby land.

Within the region, 50 % of the total annual pasture growth occurs in spring. During the period September to late December, fodder conservation involving cutting surplus pasture for silage and hay is carried out. This conserved pasture (high quality feed) is stored and fed back to stock to fill on farm feed gaps during autumn and winter. To maintain pasture production, fertilisers and, where required, soil ameliorants (e.g., lime, gypsum) are applied.

Of the dairy farms that were visited, the proposed route intersects 13 annually harvested silage and hay paddocks. This is an important issue for the landholders because on most farms, there are few alternative areas for silage and hay harvesting due to steep slopes or very wet low lying areas.

Purchased feeds generally include grains (e.g., wheat, barley and corn), pellets, as well as silage and hay (e.g., vetch, lucerne, pasture, cereals).

In addition to stock water, large quantities of clean water are required each day for cleaning the dairy plant and equipment. Sources of water are predominantly from dams, bores, springs, and roofs of buildings.

Each farm has a network of poly pipes and pumps that must be always kept operational. Milking cows consume 150 litres per day on average per year. During winter consumption can be 90 L/day and in summer consumption can be up to 210 L per head per day (source *Managing Farm Water Supplies, Agriculture Victoria* 2015).

In the dairies, plant washing/cleaning equipment and yards can use up to 45,000 L per day.

Fencing is predominantly via electrified wires, with boundary fences usually combining conventional plain and electrified wires.

Few of the dairy farms grow fodder crops, however where grown they include millet, pasja, turnips, forage rape for grazing from mid-January to early April.

When grazing is completed, there is always a rush to re-sow crop areas to pasture species (ryegrass and clover) to ensure there is time for the pastures to become established before winter.

6.4.2 Beef production

Beef production in Victoria (including veal) has averaged almost 418,000 tonnes per year in the last ten years (Agriculture Victoria 2023b).

Key activities include beef production (through growing weaner stock to meet a range of market specifications), rearing beef heifer replacement stock and for marketing, as well as agistment for cattle including specifically for pre and post marketing.

The Gippsland region is a major production area in Victoria. Within Gippsland the South Gippsland Shire is the key production region because of its reliable rainfall, productive pasture feed base and location to markets.

Further information about the Victorian beef industry is available in Appendix B:

6.4.2.1 Beef production property visits

Visits were made to a representative sample of eight beef production properties.

This area of the Gippsland region is suited to beef breeders as well as weaner cattle for grazing and grow through to meet prime young cattle standards for slaughter and consumption within Australia and abroad. The largest facility visited was operating with approximately 2200 stock, including breeding cows and younger prime quality meat for export. Most beef producers visited were within the range of 160 to 800 head of cattle.

Many of the beef production properties along the proposed route are parttime production units where the operators also work off-farm.

The importance of fodder conservation during the period September to December, involving cutting surplus pasture for silage and hay is as important on beef production properties as it is on the dairy farms. Conserved pasture (high quality feed) is stored and fed back to stock to fill on farm feed gaps during autumn and winter.

Of the eight beef production properties that were visited, the proposed route intersects 12 paddocks identified by landholders as regularly used for silage or hay production. It is estimated that 34 beef cattle properties are impacted by the proposed alignment.

Similarly, to the dairy farms, stock water is a major concern. Beef cattle consume an average of 70 litres of water per day, and double that in summer. Traditionally, stock water sources have been creeks and off stream dams. Now large troughs are fed by a network of pumps and poly piping.

A major focus for beef (and sheep) production properties are the stock yards, their requirement to meet OH&S standards, and the maintenance of well fenced lanes or farm tracks. Fencing is approximately 60 % electrified wires; the remainder is conventional plain and barbed wires.

Planning has commenced on one property to construct a large dam to hold water for irrigation. This dam would be clear of the proposed alignment, although within the same paddock.

6.4.3 Horticulture

The red gradational soils through the Mirboo North district are very suited to horticultural production because of the friable and fertile nature of the soil which has been derived from basaltic rocks.

Local horticultural practices include potato production of all varieties to supply certified (pest and disease free) potato seed to the potato growing industry in Victoria and interstate, production of a range of potato varieties to meet commercial market requirements and production of other crops to meet niche market requirements e.g., sweet corn, peas, beans, broccoli.

A usual potato cropping and harvesting timetable would be:

- Main planting (including ground preparation) from mid-August to December;
- Major harvesting from January to mid-June;
- Crop irrigation in summer/autumn – December to late March (could include April and early May in some drier years to ensure the soil remains moist and cool to protect the unharvested crop).

A particular issue for potato cropping is the potato cyst nematode (PCN) and it is known to occur in the districts of Thorpdale, Boneo, Wandin, Gembrook, and Koo Wee Rup (Agriculture Victoria website: https://agriculture.vic.gov.au/biosecurity/pest-insects-and-mites/priority-pest-insects-and-mites/potato-cyst-nematode#h2-2). PCN causes significant decreases in yield, increases in production costs, and if confirmed on-site, may result in trade restrictions being imposed. It is easily spread on seed potatoes, soil and machinery, as well as by wind and water (Plant Health Australia Ltd. 2018). Effective biosecurity measures including cleaning boots and machinery when entering and leaving properties, are essential and has limited the spread of this pest in these districts.

6.4.4 Organic farming

The proposed alignment extends through two neighbouring organic farms, located just east of the Mardan Road, between Mardan and Mirboo North. These farms are long term established organic farms, one of which produces organic beef.

Key concerns for both landholders are losing their organic certification or ability to obtain their recertification due to project activities, including construction site access and off-site discharges, erosion and sedimentation. To apply and gain organic certification status the landholders have to undertake a detailed testing program and review process over many years.

Organically farmed beef generally has attributes such as more conservative stocking rates, to maintain ground cover and soil organic matter objectives of the farm operation.

Organic farming includes specialist soil, plant and animal health treatment requirements.

6.4.5 Horse breeding, training and spelling

Small operations occur in locations near racetracks where advanced training can occur and short travel distances to race meetings. Often the horses are owned and operated by the facility owner, which can be family operations. Feed is imported to these facilities and there is minimal reliance on pastures or grazing. One horse training facility was able to be interviewed during property visits, this property was mainly focussed on racing in the Sale and Latrobe Valley areas.

6.4.6 Forestry

Latrobe City Council local government area is at the centre of a large forestry industry supplying Opal Australian Paper, one of the largest paper manufacturing facilities in the southern hemisphere (Latrobe Planning Scheme, 2022).

The proposed project will pass through forestry plantations that are in the area from between Baromi and Driffield.

Hancock Victorian Plantations (HVP) is one of Australia's largest private timber plantation companies (HVP, 2014), managing a total 165,000 ha of pine and eucalypt plantation across southern Victoria, with 81,421 ha in Gippsland alone. The extent of HVP's title holdings across Victoria is illustrated in Figure 6-1.

The company harvests and replants on a sustainable basis about 6,000 ha of plantation per year. Annually they supply approximately three million tonnes of softwood (pine), 300,000 tonnes of hardwood (eucalyptus). The timber is supplied to sawmills, panel producers and pulp and paper mills in Australia and overseas. Plantation pine thinning and sawmill residues are also exported overseas.

Around 70 % of the company's total Victorian landholdings are sustainably managed plantations, growing largely on land that was previously cleared for farming. HVP maintains the remaining 30 % of its holdings in a protected area for plantation protection, conservation and other community values. In the Strzelecki Ranges, the company has set aside almost half of its land from timber production, managing this native forest for conservation.

Defined Forest Area is an area of forest (including land and water) to which the requirements of the Australian Forestry Standard are applied and to which the forest manager can demonstrate management control. HVP's Gippsland DFA includes:

- Plantation: 81,421 ha.
- Infrastructure: 8,862 ha.
- Custodial: 33,881 ha.
- **Total: 124,164 ha.**

The area required for the project construction through the forestry plantations is approximately 41.02 ha.

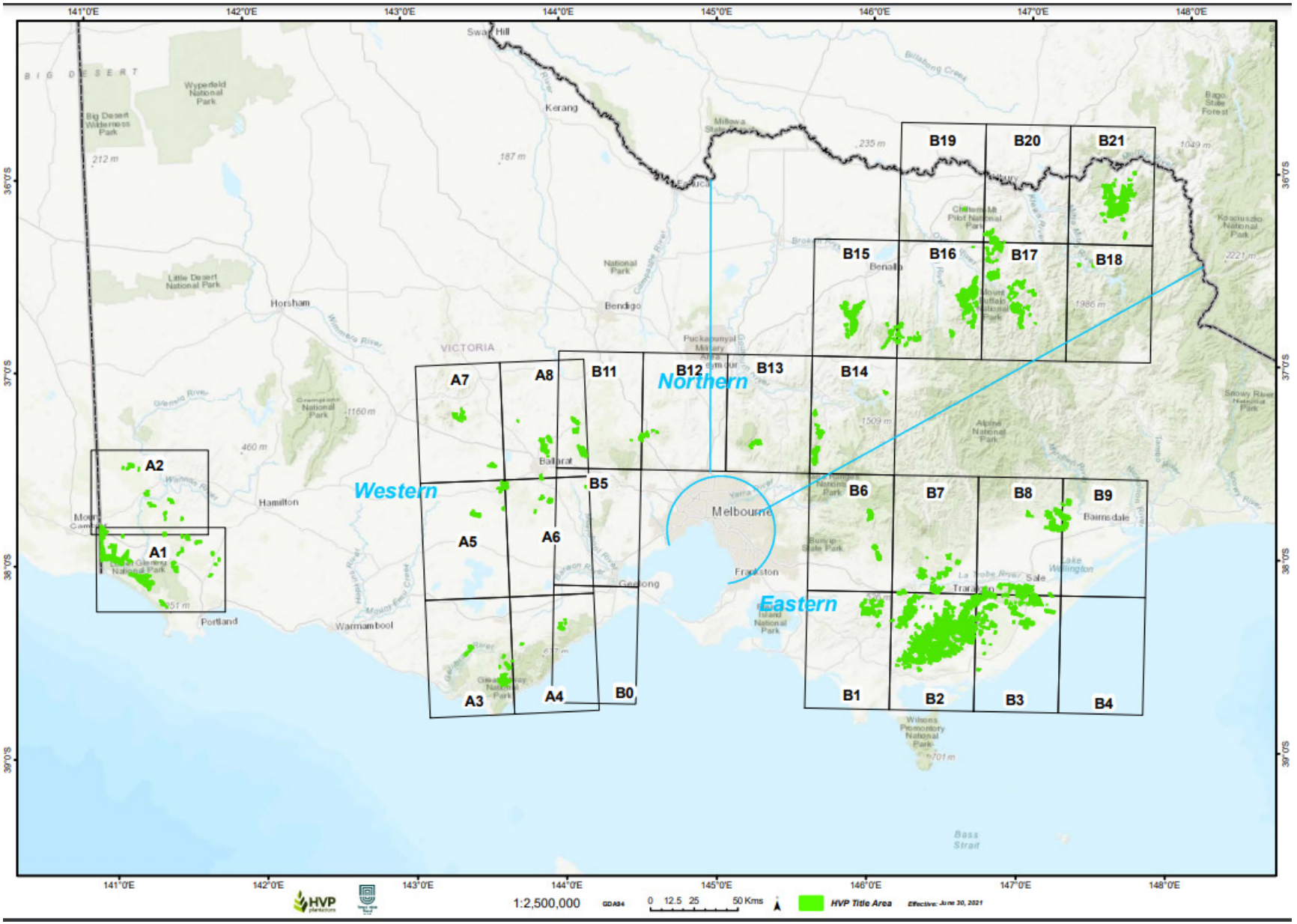

Figure 6-1 HVP Victorian holdings (HVP 2021)

7. AGRICULTURE AND FORESTRY VALUES AND SENSITIVITY

This section presents the sensitivity assessment of the key agricultural and forestry values identified in the study area.

From the baseline characterisation of agricultural and forestry practices in the study area, two key values were identified:

- Land capability; and
- Farm or plantation planning and associated practices.

The sensitivity of these values for each of the practices have been assessed using the sensitivity criteria described in section 5.3.1 of this report. Table 7-1 outlines the sensitivity of each value and the criteria that contribute to the overall sensitivity of the value for each type of agricultural and forestry practice.

Table 7-1 Sensitivity of agriculture and forestry values and criteria

Activity	Value	Overall sensitivity	Criteria	Criteria sensitivity
Dairying	Land capability	High	High carrying capacity	High
			High fodder and water requirements; supplementary feed in autumn and winter, and in dry years summer	High
			Soils with defined soil horizons that may be compromised by disturbance	High
	Farm or plantation infrastructure, practices and planning	High	Significant infrastructure including milking sheds, laneways, water supply systems, effluent management systems, feed storage and feed system	High
			Intensive cell grazing	High
			Significant investment in electronic stock monitoring systems	Moderate
			Significant investment in pasture regeneration and enhancement	High
			Significant investment in farm development plans to maximise carrying capacity and production	High
Beef production	Land capability	Moderate	High fodder and water requirements, supplementary feed in autumn and winter and during dry summers	High
			Soils with defined soil horizons that may be compromised by disturbance	Moderate

Activity	Value	Overall sensitivity	Criteria	Criteria sensitivity
			Moderate to high carrying capacity depending on target market and climatic conditions.	Moderate
	Farm or plantation infrastructure, practices and planning	Moderate	Access to fodder paddocks for cultivation and maintenance of supplementary feed source in winter and dry summers	High
			Significant infrastructure including stock yards, well fenced laneways and farm tracks, fencing includes electric, plain and barbed wire fencing.	High
			Rotational grazing	Moderate
			Significant investment in farm development plans to maximize carrying capacity and production	Moderate
Horticulture	Land capability	Moderate	Soils with defined soil horizons that may be compromised by disturbance	Moderate
			High water requirements	Moderate
	Farm or plantation infrastructure, practices and planning	High	High investment in irrigation infrastructure for crops	Moderate
			High investment in infrastructure for harvesting, sorting and packing produce.	High
			High biosecurity requirements	High
Organic farming	Land capability	High	Maintenance of land capability aspects for certifications	High
			High carrying capacity	High
	Farm or plantation infrastructure, practices and planning	High	High biosecurity requirements to maintain organic certifications.	High
			Long term inputs efforts to increasing soil organic matter.	High
			Significant investment in farm development plans to maximize carrying capacity and production	High
Horse breeding, training and spelling	Land capability	High	Soils with defined soil horizons that may be compromised by disturbance	Moderate
			High fodder and water requirements, supplementary feed in autumn and winter and during dry summers	High

Activity	Value	Overall sensitivity	Criteria	Criteria sensitivity
	Farm or plantation infrastructure, practices and planning	High	Access to fodder paddocks for cultivation and maintenance of supplementary feed source in winter and dry summers	High
			Significant infrastructure including yards, stables, areas, exercise and training areas, feed storage and dispensing, laneways, water supply systems well fenced laneways and farm tracks, fencing includes electric, plain wire, timber rubber, welded steel.	High
Forestry	Land capability	High	Coupe size	High
			Soils with defined soil horizons that may be compromised by disturbance	Moderate
	Farm or plantation infrastructure, practices and planning	High	Investment in access tracks and timber and waste timber loading/handling facilities	High
			Harvest, planting and growing coupe planning and operations.	High

8. ISSUES AND POTENTIAL IMPACT ASSESSMENT

This section assesses the potential impacts to agricultural and forestry practices resulting from construction and operation activities on agricultural and plantation land and recommends EPRs.

Impacts during decommissioning have not been assessed as it is assumed that cables will remain in the ground and therefore that no further ground disturbance is anticipated.

Key potential impacts requiring assessment include disruption to farm operations and forestry during construction and operation of the project.

The key value of agricultural land is its capability to support agricultural activities. The project is proposed to be located in primarily agricultural areas within Latrobe and South Gippsland municipalities. As discussed in section 6.3, Gippsland agriculture is comprised of livestock grazing, forestry plantations (hardwood and soft wood), dairy cattle farms, horticultural production farms including market gardens, mixed farming and grazing, and residential rural holdings that support horse and small-scale mixed farming outputs. Land capability for the support of these agricultural industries appears strong.

Farm or plantation infrastructure, practices and planning represents the value of activities that can be undertaken on the land, supporting infrastructure that is in place and part of the future plans for development of a property to maximise productivity and yield. This value captures both the long- and short-term goals of the landowners for their property.

Agricultural productivity and yield represent the ratio of agricultural production inputs to outputs. Factors that affect productivity and on farm yield include seasonal climate conditions, policy, market conditions, technology, and access to supportive infrastructure networks. Other factors that affect productivity include farm size, innovation, financial capacity, on farm management practices and soil fertility and access to water resources.

The basic attributes of the land provide the building blocks for agricultural productivity and yield. These attributes include topography, soil properties (fertility), rainfall, water availability and access, climatic conditions. Optimal productivity in the form of livestock carrying capacity and maximum crop yield may occur if the soil properties, climatic and environmental conditions support the groundcover or crop species grown on the land.

Potential impacts to productivity and crop yield may be caused by environmental pollution, incursions to farm biosecurity, water accessibility issues, change to soil properties and slope, access to on farm and external supporting infrastructure and services required for farm input and movement of goods for sale and impeded stock, supplies and produce haulage access from internal access tracks, stock yards and farm buildings.

Land capability may also be impacted by incorrect management of hazardous materials and chemicals used in the construction of the project. This is of particular concern given that the AOD also includes two organic farming properties, which may have specific requirements to maintain certifications. Depending on the nature of the organic farming and its certification, this may include factors such as biosecurity and chemical use.

A key consideration for each agricultural practice along the alignment is that no farm business will be removed from operation because of the project. Rather properties will be impacted during construction and there may be some restrictions in operation.

8.1 CONSTRUCTION IMPACTS

The potential impacts on land capability for agriculture from the construction of the project are:

- **Reduced productivity or yields** from disturbance during construction.
- **Reduced productivity or yields** caused by degraded soil structure, soil moisture content and fertility during construction.

- **Reduced amenity or reduced productivity or yields** from dust emissions and deposition.
- **Lost or reduced production or yields** through ineffective biosecurity controls during construction leading to introduction or spread of animal or plant pathogen or noxious weed infestation.

The potential impacts on the value farm infrastructure, practices and planning from the construction of the project are:

- **Impact on production** during construction caused by need to modify or adopt alternative agricultural practices.
- **Reduced farm income** due to changes to operations and constraints on farm development plans during construction.

Potential impacts to farm access may occur in construction. To ensure landholders can confidently operate their properties effectively, maintaining stock proof fencing, construction of stock proof fencing beside the construction area, and provision of effective and safe crossing points to move cattle and farm machinery across will be required.

The project requires construction of access tracks to the alignment. The construction of these access tracks albeit temporary may impact soil properties via compaction through the constant use and weight of heavy machinery. Installation of access tracks for construction may also impact existing farm drainage if not addressed in the design of the track. Damage to land capability could also be incurred if all weather access tracks were not installed and construction or operational activities needed to utilise additional areas for access in wet weather.

Existing roads and tracks such as farm access or forestry plantation tracks are proposed to be used for access wherever possible. Existing tracks may be upgraded to facilitate construction traffic, in consultation with landowners. If new access tracks are to be constructed and they are not required for operations, they will be removed unless landowners wish to keep them.

Construction may also generate dust, noise, sedimentation, and erosion impacts to adjacent agricultural operations, which may impact the productivity and yield of agricultural produce by reducing ideal growing conditions. Leafy vegetables and fruit growth have potential to be impacted by potential offsite dust discharges.

Construction plant and vehicles, importation of construction material, moving up and down the alignment, has the potential to introduce external seed stock (weeds), plant and/or animal pathogens resulting in disease and ultimately reduced livestock carrying capacity and/or health of livestock and crop yield. It is important to ensure all land access during construction is subject to relevant on farm biosecurity controls and in accordance with existing property specific biosecurity controls.

Southern Gippsland and Latrobe Valley experience highly variable climatic conditions, annual rainfall varies across the topography of the region. Water sources utilised to support pasture and crop growth include rainfall and irrigation from dams and springs. Bores, springs, dams and surface water streams provide water sources for stock water in the region. The project may impact water supply that supports agricultural land capability. This may be through the interruption to water reticulation infrastructure or accessibility for stock and irrigation, and availability of water in competition with construction demands.

The construction duration in each property is short, and pre-existing land uses will mostly be able to resume once reinstatement has been completed

8.1.1 Disturbance during construction

Construction activities will disturb farming practices and could reduce productivity and yields. During construction, access licences and construction leases will be entered into with landowners or land managers to ensure access for construction contractors. These agreements will include financial arrangements to compensate landowners for use of their land during construction.

During negotiations for the easement option agreement, MLPL representatives will discuss with landholders the practical aspects and potential impacts of the construction on their property and rehabilitation phases of the project. Such inputs may include confirming specific requirements for easement fencing, access points, continuation of water supply across the working area, biosecurity requirements, storage of surplus soil and rehabilitation requirements.

This detail will be recorded in a property management plan to be developed by MLPL in agreement with landholders. Going into construction, the property management plans will be used to inform the construction management activity.

The construction corridor will be 20 – 36 m wide (AOD) during the construction period; this will facilitate land cable installation and be temporarily unavailable to agriculture. Table 8-1 provides estimates of how many ha of land will be temporarily unavailable per agricultural type. The numbers in the tables are estimates based on the width of the construction corridor plus visual assessment (from aerial photography) of additional land that would be lost through temporary severance (e.g., where the alignment cuts off the corner of a paddock which is then also inaccessible).

During construction access to parts of the agricultural land may be impeded by the construction corridor. This may require rerouting infrastructure to provide alternative arrangements during the construction period. On completion of construction reinstatement of access to all areas of landowners' agricultural land is expected.

Table 8-1 Land temporarily unavailable to agriculture (construction)

Agriculture type	Hectares removed from production during construction phase (ha)
Domestic livestock grazing	30
Livestock production – dairy cattle	180
Horticulture	35
Miscellaneous improvements on residential rural land	8
Grazing and mixed farming	200

Source: Modified from the Victorian Land Use Information System 2016-2017 (VLUIS) using aerial imagery.

A converter station at Hazelwood will also impact availability of agricultural production and yield on land previously used for agriculture. Table 8-2 provides estimates of how many ha of land may be temporarily unavailable per agricultural type.

Table 8-2 Converter stations

Converter station site	Agriculture type	Hectares subject to the project (ha)
Hazelwood	Mixed farming and grazing (generally more than 20ha)	10.8

The EPRs presented in Table 8-3 are proposed to minimise the significance of potential impacts on land temporarily disturbed and subject to easement.

Table 8-3 Environmental performance requirements: impacts to agricultural land temporarily disturbed during construction

EPR ID	Environmental performance requirement	Project stage
A01	Complete property condition surveys prior to construction	Construction
A02	Develop and implement property management plans to avoid or minimise impacts on agricultural and forestry properties	Construction
A03	Develop and implement property soil management plans to avoid or minimise impacts on agricultural and forestry properties	Construction
A04	Develop and implement a rehabilitation strategy to avoid or minimise impacts on agricultural and forestry properties	Construction
A05	Avoid impacts on organic farming certification	Construction

8.1.2 Impacts to soil structure, moisture content and fertility

The project may impact agricultural practices and production if management of the land capability factors (e.g., slope, soil fertility, access to water resource) was not actively monitored and managed during construction. There could be reduce productivity or yields due to degraded soil structure, soil moisture content and fertility. For example, should soil be managed incorrectly in the AOD, there is potential that soil properties would be degraded, and more inputs would need to be bought in and effort applied by the landowner to bring that degraded soil back into optimal fertility.

Rehabilitation of land following use for construction is critical to manage and prevent impacts to land capability. These impacts could include increased inputs and associated costs to improve soil profile characteristics, restoration of topsoils and extra effort and inputs into associated organic matter content. Management measures must be developed specific for each property and implemented to reinstate the property to maintain soil stability, fertility, and ground cover species that are optimal for the industry focus.

Inspections will be undertaken following construction for two years, to confirm physical disturbance during construction had been effectively reinstated and to monitor property conditions considering soil compaction by plant, micro-variations in drainage associated with trench backfill, shifts to pH or other chemical parameters due to the nature of the backfill material.

The EPRs presented in Table 8-4 are proposed to minimise the significance of potential impacts relating to rehabilitation of agricultural land and reinstatement of access to agricultural land.

Table 8-4 Environmental performance requirements: rehabilitation of agricultural land and reinstatement of access to agricultural land

EPR ID	Environmental performance requirement	Project stage
A01	Complete property condition surveys prior to construction	Construction
A02	Develop and implement property management plans to avoid or minimise impacts on agricultural and forestry properties	Construction
A03	Develop and implement property soil management plans to avoid or minimise impacts on agricultural and forestry properties	Construction
A04	Develop and implement a rehabilitation strategy to avoid or minimise impacts on agricultural and forestry properties	Construction
A05	Avoid impacts on organic farming certification	Construction

8.1.3 Dust emissions and deposition

There could be reduced amenity or reduced productivity or yields from dust deposition on agricultural crops. Agricultural activities generate dust during cultivation, and when traffic movement occurs along farm laneways and farm access roads. Dust events are typically episodic and short in duration, e.g., the time taken to plough and sow a paddock or for a milk tanker to collect milk.

Construction activities will generate dust for the duration of the activities, as they are continuous for weeks, months and years at some locations. Dust can cause nuisance and deposit on surfaces and plants. Dust emissions and deposition can affect amenity and if significant, rainwater tank water quality, plant photosynthesis and animal health. Topsoil stripping, trench excavation and backfilling, construction workspace reinstatement and rehabilitation, access tracks and haul roads are the main sources of dust, with materials and waste transport, handling and stockpiling other sources. With a substantial length of route in agricultural land, dust management is important to avoid adverse impacts on agricultural production and the amenity of farmers and their families. Particularly sensitive locations are farmhouses and farm worker accommodation, farm water supplies fed by water collected from rooves, animal nurseries, animal handling facilities including stockyards and dairies, farm orchards and vegetable patches, and solar panels.

Monitoring for dust generating conditions (weather and type and volume of traffic movements), applying water to suppress dust, and regular inspection of dust generating construction activities and sensitive receptors for dust effects will reduce the potential for adverse effects from dust emissions and deposition.

The EPRs presented in Table 8-5 are proposed to minimise the significance of potential impacts relating to dust emissions and deposition during construction.

Table 8-5 Environmental performance requirements: dust emissions and deposition

EPR ID	Environmental performance requirement	Project stage
A02	Develop and implement property management plans to avoid or minimise impacts on agricultural and forestry properties	Construction
A03	Develop and implement property soil management plans to avoid or minimise impacts on agricultural and forestry properties	Construction
A04	Develop and implement a rehabilitation strategy to avoid or minimise impacts on agricultural and forestry properties	Construction
A05	Avoid impacts on organic farming certification	Construction

8.1.4 Biosecurity controls

Ineffective biosecurity controls during construction could lead to the introduction or spreading of weeds and pathogens. There is the potential for weeds, pests and diseases to be spread to properties from neighbouring areas, roadsides, and movement of plant, machinery vehicles along the alignment from inside and potentially outside the study area.

A particular concern to the animal industries (dairy and beef) is foot and mouth disease, lumpy skin disease and Johne's disease. In the horticultural industries plant infections such as potato cyst nematode (PCN), aphid infections carrying disease, and blight (Phytophthora spores) are examples of plant tissue risks.

Spread of declared noxious weeds such as the common local examples; thistle, ragwort and blackberry, as well as other plants costly to eradicate from productive pastures that are also spread via pieces of plant roots /rhizomes and vegetative stems i.e., Kikuyu grass, and seeds from barley grass either on plants or lying dormant in soil.

Based on the available information from Agriculture Victoria, there are no identified biosecurity-controlled land parcels along the alignment. There were also no control properties identified from the site visits however there were a number of properties and landowners not visited as part of this study. It is important that no pests, weeds, or diseases are introduced by construction activities and vehicles. Informed by engagement with Agriculture Victoria and each land manager, biosecurity protocols should be developed and implemented during construction for each property specific to the agricultural activities being undertaken (EPR A02).

The EPRs presented in Table 8-6 are proposed to minimise the significance of potential impacts relating to biosecurity during construction.

Table 8-6 Environmental performance requirements: biosecurity

EPR ID	Environmental performance requirement	Project stage
A02	Develop and implement property management plans to avoid or minimise impacts on agricultural and forestry properties	Construction
A05	Avoid impacts on organic farming certification	Construction

8.1.5 Modified or alternative agricultural practices

Construction of the project has the potential to impact some of the current infrastructure required and operational practices for agricultural operations. These impacts may include rerouting infrastructure such as fencing, troughs, water reticulation infrastructure, electrical conduit and cables, access points, paths of travel and access to key on farm infrastructure.

Farm labour availability may be impacted during the construction phase of the project, where construction employment opportunities may present which compete with farm labour positions. This is considered as a minor temporary potential impact that could affect resources for farming and may trigger the need to adopt alternative farming practices if a shortfall in farm labour is experienced.

The EPRs presented in Table 8-7 are proposed to minimise the significance of potential impacts relating to the modification or need to adopt alternative agricultural practices.

Table 8-7 Environmental performance requirements: modification or need to adopt alternative agricultural practices

EPR ID	Environmental performance requirement	Project stage
A01	Complete property condition surveys prior to construction	Construction
A02	Develop and implement property management plans to avoid or minimise impacts on agricultural and forestry properties	Construction
A03	Develop and implement property soil management plans to avoid or minimise impacts on agricultural and forestry properties	Construction
A04	Develop and implement a rehabilitation strategy to avoid or minimise impacts on agricultural and forestry properties	Construction
A05	Avoid impacts on organic farming certification	Construction

8.1.6 Constraints on farm development plans

Farms have formal and informal development plans that aim to maximise opportunities for increasing productivity or yield or reducing costs. Farm development plans may vary in detail and timeframes for implementation. These plans are a tool to capture the goals of the property management outcomes in farming infrastructure, practices, and yield. For example, a landholder may have a five-year rotational cropping plan to meet the needs of the growing and fallow stages of the crop species and horticultural enterprise. Or a landholder may have a ten-year development plan to build up the land capability and infrastructure to increase production of the property.

The AOD covers a wide range of agricultural properties which have potential to be impacted, the project will need to ensure that landowners are not disadvantaged by the project by limiting or disrupting the implementation of farm development plans.

Where farm development plans are known they have been taken into consideration in refining the proposed route and construction methods, e.g., access track material will be suitable for dairy cattle (not abrasive such that it would cause hoof damage). It is expected there will be ongoing refinements to the proposed alignment and construction area to avoid impacts on farm development plans to the extent reasonably practicable.

The EPRs presented in Table 8-8 are proposed to minimise the significance of potential impacts relating to reduced farm income due to constraints on farm development plans.

Table 8-8 Environmental performance requirements: reduced farm income due to constraints on farm development plans

EPR ID	Environmental performance requirement	Project stage
A01	Complete property condition surveys prior to construction	Construction
A02	Develop and implement property management plans to avoid or minimise impacts on agricultural and forestry properties	Construction
A03	Develop and implement property soil management plans to avoid or minimise impacts on agricultural and forestry properties	Construction
A04	Develop and implement a rehabilitation strategy to avoid or minimise impacts on agricultural and forestry properties	Construction
A05	Avoid impacts on organic farming certification	Construction

8.1.7 Residual construction impacts

Residual impacts from construction activities on land capability for the agricultural production activities relate to the success of rehabilitation. Soil compaction, soil inversion and changed soil moisture content can affect rehabilitation success and productivity. Trench subsidence can divert overland flows causing scouring and erosion or divert water applied by irrigators causing reduced crop or pasture yields. These impacts are assessed as low, as rehabilitation success and any remedial works will be determined by inspections over two years. Inspections are required quarterly in the first year, twice in the second year after the completion of rehabilitation, and within two weeks of storm events.

Staged execution of the project will result in some farming practices being disrupted for up to four years. During this period alternative arrangements will be implemented to reduce impacts on production and operating costs. Productivity will be reduced where alternative arrangements are unable to maintain the current stocking rate and feed requirements. Pastures will take time to recover from heavier and more frequent grazing due to less paddocks being in production and rotations being more frequent.

Residual impacts from the temporary relocation of farm infrastructure have been assessed as low, as affected farm infrastructure will be reinstated as soon as practicable following construction.

8.2 OPERATION IMPACTS

The potential impacts on land capability from the operation of the project are:

- **Lost or reduced production or yields** through ineffective biosecurity controls during operation leading to introduction or spread of animal or plant pathogen or noxious weed infestation.

The potential impacts on the value farm infrastructure, practices and planning from the operation of the project are:

- **Impact on production** during operation caused by need to modify or adopt alternative agricultural practices.
- **Reduced farm income** due to changes to operations and constraints on farm development plans during operation.

During operation of the project the minor activities will be undertaken which will have localised impacts at the work site for a limited duration. Operational impacts are expected to be minor/negligible in magnitude however

the EPRs need to be applied in operation to manage the impacts to the sites, cable repair or joint pit inspection, particularly in regard to biosecurity, access and consultation with landholders.

In operation, electric and magnetic fields are not expected to impact the soils given the encasement in conduit and low likelihood of sediments surrounding the cable retaining heat. Dissipating heat from around the cable is a key engineering requirement and the thermal properties of the trench backfill will be such that heat is not retained. There is not expected to be an impact to plant and vegetation growth due to any electric and magnetic fields from cable operation.

Operational plant and vehicles moving up and down the alignment, has the potential to introduce external seed stock (weeds), plant and/or animal pathogens resulting in disease and ultimately reduced livestock carrying capacity and/or health of livestock and crop yield. It is important to ensure all land access during operations is subject to relevant on farm biosecurity controls and in accordance with existing property specific biosecurity controls.

8.2.1 Biosecurity controls

There is the potential for weeds, pests and diseases to be spread to properties from neighbouring areas, roadsides, and movement of plant, machinery vehicles along the alignment from inside and potentially outside the study area. This is described further under construction impacts.

It is important that no pests, weeds, or diseases are introduced by operations activities and vehicles. Biosecurity protocols should be developed and implemented during operation for each property specific to the agricultural activities being undertaken (EPR A06).

The EPRs presented in Table 8-9 are proposed to minimise the significance of potential impacts relating to biosecurity during operation.

Table 8-9 Environmental performance requirements: biosecurity

EPR ID	Environmental performance requirement	Project stage
A06	Develop and implement measures to avoid or minimise impacts on agricultural and forestry properties during operation	Operation

8.2.2 Modified or alternative agricultural practices

During the operation phase of the project, agricultural businesses will have an easement (20 m) on their land. The agricultural yield of such affected properties may be impacted by restrictions placed on the use of land subject to easement. Table 8-10 provides estimates of how many ha of land may be affected per agricultural type during operation. The easement will be 20 m wide to protect the cable and facilitate operational activities.

Table 8-10 Agricultural land potentially affected by the easement (operation)

Agriculture type	Hectares subject to the easement (ha)
Domestic livestock grazing	50
Livestock production – dairy cattle	280
Horticulture	50
Miscellaneous improvements on residential rural land	25
Grazing and mixed farming	380

Source: Modified from the Victorian Land Use Information System 2016-2017 (VLUIS).

Following installation of the project cables, some land uses will be prohibited (Table 4-1). Therefore, the location of the easement has considered the land uses and sought to locate the cable to minimise impacts on agricultural activities and planned development of properties.

The size of the cable easement across properties on the alignment will be 20 m wide. This will place some restrictions on the use and development of the property in the area along the easement. Primary uses along the corridor such as cropping and grazing will be permitted across the easement, however the installation of structures over the easement will be limited.

Table 4-1 reflects the preliminary proposed types of restrictions to be placed on use and development of the land in the proposed easements. Further detail will be developed on a property-by-property basis, during development of property management plans. The project will be required to compensate landowners through acquisition of the easement area. This compensation will account for restrictions to property development and use.

Landowners with properties in the easement and affected by the AOD and operational easement may have to modify or adopt new farming practices. Intensive agriculture often has the characteristics of higher supporting infrastructure and high input farming practices, intrusion of the project on an intensive agriculture operation may cause a high level of disruption to farming practices and infrastructure.

The EPRs presented in Table 8-11 are proposed to minimise the significance of potential impacts relating to the modification or need to adopt alternative agricultural practices.

Table 8-11 Environmental performance requirements: modification or need to adopt alternative agricultural practices

EPR ID	Environmental performance requirement	Project stage
A06	Develop and implement measures to avoid or minimise impacts on agricultural and forestry properties during operation	Operation

8.2.3 Constraints on farm development plans

The easement covers a wide range of agricultural properties which have potential to be impacted, the project will need to ensure that landowners are not disadvantaged by the project by limiting or disrupting the implementation of farm development plans.

Restrictions as to activity over the easement post-construction and during operations may result in elements of farm development plans not being possible (e.g., any plan to introduce and grow trees over the easement, install a dam, erect a farm building etc.).

The EPRs presented in Table 8-12 are proposed to minimise the significance of potential impacts relating to reduced farm income due to constraints on farm development plans.

Table 8-12 Environmental performance requirements: reduced farm income due to constraints on farm development plans

EPR ID	Environmental performance requirement	Project stage
A06	Develop and implement measures to avoid or minimise impacts on agricultural and forestry properties during operation	Operation

8.2.1 Residual operation impacts

Operation and maintenance activities are unlikely to affect farm infrastructure, as the activities will be confined to cable joint pits or cable fault locations, which have relatively small footprints.

The easement and land cables will constrain farm development plans reducing options and flexibility in configuring paddocks and siting farm infrastructure to support diversified or alternative farming practices. The proposed route has been designed to reduce the potential for residual impacts on farm development plans; taking future farm development ideas into consideration if known and shared by landowners.

8.3 DECOMMISSIONING IMPACTS

The operational lifespan of the project is a minimum 40 years. At this time the project will be either decommissioned or upgraded to extend its operational lifespan.

Decommissioning will be planned and carried out in accordance with regulatory and landowner or land manager requirements at the time. A decommissioning management plan will document the measures to mitigate impacts from the decommissioning activities. The plan will be prepared at least six months 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.

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. Land use may include re-use for electricity transmission infrastructure, re-use for another purpose or return to previous land use where practicable.

8.4 IMPACT ASSESSMENT SUMMARY

The potential impacts on agricultural activities due to the construction of the project are outlined in Table 8-13 (construction impacts) and Table 8-14 (operation impacts), which documents the:

- sensitivity and magnitude ratings based on the criteria tables presented in Section 5.3;
- significance of the impact based on the matrix in Section 5.3.3
- impact assessment prior to the implementation of the EPRs;
- residual impact post EPR application.

Potential impacts by agriculture production type are summarised in the following subsections.

Table 8-13 Summary of construction impacts

Impact	Activity type	Initial impact assessment			Environmental performance requirements	Justification	Residual impact assessment		
		Sensitivity	Magnitude	Significance			Sensitivity	Magnitude	Impact
Value: Land capability									
Reduced productivity or yields from disturbance during construction	Dairying	High	Moderate	High	A01, A02, A03, A04	Understanding the existing conditions, adjusting the standard controls to the specific conditions of each property, managing soils and rehabilitating the property considering the existing conditions reduces impacts. Addressing the specific requirements for organic farming will avoid impacting organic farming certification.	High	Negligible	Low
	Beef production	Moderate	Moderate	Moderate	A01, A02, A03, A04		Moderate	Minor	Low
	Horticulture	Moderate	Moderate	Moderate	A01, A02, A03, A04		Moderate	Negligible	Low
	Organic farming	High	Moderate	High	A01, A02, A03, A04, A05		High	Minor	Moderate
	Horse breeding, training and spelling	High	Moderate	High	A01, A02, A03, A04		High	Negligible	Low
Reduced productivity or yields caused by degraded soil structure, soil moisture content and fertility during construction	Dairying	High	Moderate	High	A01, A02, A03, A04	Understanding the existing conditions, adjusting the standard controls to the specific conditions of each property, managing soils, including reinstating soil horizons, protecting topsoil, and remediating compaction, and rehabilitating the property considering the existing conditions reduces impacts. Addressing the specific requirements for organic farming will avoid impacting organic farming certification.	High	Negligible	Low
	Beef production	Moderate	Moderate	Moderate	A01, A02, A03, A04		Moderate	Negligible	Low
	Horticulture	Moderate	Moderate	Moderate	A01, A02, A03, A04		Moderate	Negligible	Low
	Organic farming	High	Major	Major	A01, A02, A03, A04, A05		High	Negligible	Low
	Horse breeding, training and spelling	High	Moderate	High	A01, A02, A03, A04		High	Negligible	Low
	Dairying	High	Minor	Moderate	A02, A03, A04		High	Negligible	Low

Impact	Activity type	Initial impact assessment			Environmental performance requirements	Justification	Residual impact assessment		
		Sensitivity	Magnitude	Significance			Sensitivity	Magnitude	Impact
Reduced amenity or reduced productivity or yields from dust emissions and deposition	Beef production	Moderate	Minor	Low	A02, A03, A04	Monitoring dust generating conditions, inspecting for dust deposition and suppressing dust reduces adverse effects of dust and dust deposition.	Moderate	Negligible	Low
	Horticulture	Moderate	Minor	Low	A02, A03, A04		Moderate	Negligible	Low
	Organic farming	High	Minor	Moderate	A02, A03, A04, A05		High	Negligible	Low
	Horse breeding , training and spelling	High	Minor	Moderate	A02, A03, A04		High	Negligible	Low
Lost or reduced production or lost or reduced yields through ineffective biosecurity controls during construction leading to introduction or spread of animal or plant pathogen or noxious weed infestation	Dairying	High	Moderate	High	A02	Effective implementation of biosecurity controls in accordance with EPR02 will reduce the risk of introducing and spreading animal and plant pathogens, pests and weeds. Addressing the specific requirements for organic farming will avoid impacting organic farming certification	High	Negligible	Low
	Beef production	Moderate	Moderate	Moderate	A02		Moderate	Negligible	Low
	Horticulture	Moderate	Major	High	A02		High	Negligible	Low
	Organic farming	High	Major	Major	A02, A05		High	Negligible	Low
	Horse breeding, training and spelling	High	Moderate	High	A02		High	Negligible	Low
Value: Farm or plantation infrastructure, practices and planning									
Impact on production during construction caused by need to modify or adopt alternative agricultural practices	Dairying	High	Moderate	High	A01, A02, A03, A04	Understanding the existing conditions, adjusting the standard controls to the specific conditions of each property, managing soils and rehabilitating the property considering the existing conditions reduces impacts. Addressing the specific requirements for organic farming will avoid	High	Minor	Moderate
	Beef production	Moderate	Moderate	Moderate	A01, A02, A03, A04		Moderate	Minor	Low
	Horticulture	High	Moderate	High	A01, A02, A03, A04		High	Negligible	Low
	Organic farming	Very high	Severe	Major	A01, A02, A03, A04, A05		Very high	Negligible	Low
	Horse breeding,	High	Minor	Moderate	A01, A02, A03, A04		High	Negligible	Low

Impact	Activity type	Initial impact assessment			Environmental performance requirements	Justification	Residual impact assessment		
		Sensitivity	Magnitude	Significance			Sensitivity	Magnitude	Impact
	training and spelling					impacting organic farming certification			
Reduced farm income due to constraints on farm development plans during construction.	Dairying	High	Moderate	High	A01, A02, A03, A04	Understanding the existing conditions, adjusting the standard controls to the specific conditions of each property, managing soils and rehabilitating the property considering the existing conditions reduces impacts. Addressing the specific requirements for organic farming will avoid impacting organic farming certification	High	Minor	Moderate
	Beef production	Moderate	Minor	Low	A01, A02, A03, A04		Moderate	Negligible	Low
	Horticulture	High	Moderate	High	A01, A02, A03, A04		High	Negligible	Low
	Organic farming	High	Major	Major	A01, A02, A03, A04, A05		High	Negligible	Low
	Horse breeding, training and spelling	High	Minor	Moderate	A01, A02, A03, A04		High	Negligible	Low

Table 8-14 Summary of operation impacts

Impact	Activity type	Initial impact assessment			Environmental performance requirements	Justification	Residual impact assessment		
		Sensitivity	Magnitude	Significance			Sensitivity	Magnitude	Impact
Value: Land capability									
Lost or reduced production or lost or reduced yields through ineffective biosecurity controls during operation leading to introduction or	Dairying	High	Moderate	High	A06	Effective implementation of biosecurity controls in accordance with EPR06 will reduce the risk of introducing and spreading animal and plant	High	Negligible	Low
	Beef production	Moderate	Moderate	Moderate	A06		Moderate	Negligible	Low
	Horticulture	Moderate	Major	High	A06		High	Negligible	Low
	Organic farming	High	Major	Major	A06		High	Negligible	Low

Impact	Activity type	Initial impact assessment			Environmental performance requirements	Justification	Residual impact assessment		
		Sensitivity	Magnitude	Significance			Sensitivity	Magnitude	Impact
spread of animal or plant pathogen or noxious weed infestation	Horse breeding, training and spelling	High	Moderate	High	A06	pathogens, pests and weeds.	High	Negligible	Low
Value: Farm or plantation infrastructure, practices and planning									
Impact on production during operation caused by need to modify or adopt alternative agricultural practices	Dairying	High	Moderate	High	A06	Implementing an OEMP with measures to address biosecurity protocols, , reinstatement and rehabilitation, access to certified organic farms the existing conditions, and measures to avoid impacts to farming and forestry infrastructure, practices and operations during operation activities reduces impacts	High	Minor	Moderate
	Beef production	Moderate	Moderate	Moderate	A06		Moderate	Minor	Low
	Horticulture	High	Moderate	High	A06		High	Negligible	Low
	Organic farming	Very high	Severe	Major	A06		Very high	Negligible	Low
	Horse breeding, training and spelling	High	Minor	Moderate	A06		High	Negligible	Low
Reduced farm income due to constraints on farm development plans during operation	Dairying	High	Moderate	High	A06	Implementing an OEMP with measures to address biosecurity protocols, , reinstatement and rehabilitation, access to certified organic farms the existing conditions, and measures to avoid impacts to farming and forestry infrastructure, practices and operations during operation activities reduces impacts	High	Minor	Moderate
	Beef production	Moderate	Minor	Low	A06		Moderate	Negligible	Low
	Horticulture	High	Moderate	High	A06		High	Negligible	Low
	Organic farming	High	Major	Major	A06		High	Negligible	Low
	Horse breeding, training and spelling	High	Minor	Moderate	A06		High	Negligible	Low

8.4.1 Dairying

Dairy farming is intensive grazing which requires high inputs (fertiliser or organics and active tilling of soils) to maintain improved pastures. Movement of cattle throughout the property morning and evening must occur for fresh pastures to be grazed between milking.

Dairy cattle enterprises require electronic tagging systems on livestock for NLIS (National Livestock Identification System), and electronic collars for monitoring animal health and production.

Access to water for stock, dairy cleaning and irrigation purposes is pivotal to dairy operations.

Dairying operations are expected to be able to be maintained throughout construction and operation providing that:

- Access to pastures and farm infrastructure is maintained for livestock movements and farm operations.
- Paddock rotations are considered in the construction planning.
- Soils are appropriately reinstated so that pasture growth resumes to pre-construction levels.
- Any farm infrastructure including windbreaks are reinstated.

8.4.2 Beef production

Specific considerations for landowners operating beef cattle enterprises include the pasture and stock rotation requirements including strip grazing. Beef cattle enterprises also require unimpeded access to stock laneways and stock handling infrastructure.

Beef cattle also require NLIS electronic tagging, Infrastructure implemented by the project should not negatively impact this nationally implemented animal identification scheme.

Regenerative agriculture pasture management is being evaluated by a small number of dairy and beef farmers. This involves planting a ‘multi species’ blend usually twice per year. The standing crop is grazed by livestock.

Beef operations are expected to be able to be maintained throughout construction and operation providing that:

- Access to pastures and farm infrastructure is maintained for livestock movements and farm operations.
- Paddock rotations are considered in the construction planning.
- Soils are appropriately reinstated so that pasture growth resumes to pre-construction levels.
- Any farm infrastructure including windbreaks are reinstated.

8.4.3 Horticulture

Key elements to the horticultural enterprises along the alignment include maintenance of soil moisture, capacity, structure. Horticultural enterprises have high infrastructure requirements, which may include hot houses, green houses, irrigation, drainage systems, sorting, packing, storage and cleaning facilities, and machinery for ground preparation, planting and harvesting.

Some crop varieties (e.g., seed potatoes) cannot be replanted in consecutive years and fallow crops or pasture must be planted. This is done to reduce the risk of plant disease being carried over in crops and to increase nutrients back into the soil.

Like the dairy and beef industry, requirements of produce supply contracts must be met.

Horticulture operations are expected to be able to be maintained throughout construction and operation providing that:

- Access to farm infrastructure is maintained for farm operations.
- Planting rotations are considered in the construction planning.
- Soils are appropriately reinstated so that crop growth resumes to pre-construction levels.
- Biosecurity is maintained.
- Any farm infrastructure including windbreaks are reinstated.

8.4.4 Organic farming

Organic farms along the alignment have invested significant efforts and finances in improving soils and pasture to sustain seasonal variability. Building the capability of the soils in organic farming is a long term commitment. High investments into biosecurity measures and their maintenance is required to ensure certification requirements are met.

Water quality and accessibility are also important to these operations and for the projected quality and carrying capacity of stock on these enterprises.

Organic farming operations are expected to be able to be maintained throughout construction and operation providing that:

- Access to pastures and farm infrastructure is maintained for livestock movements and farm operations.
- Paddock rotations are considered in the construction planning.
- Soils are appropriately reinstated so that pasture growth resumes to pre-construction levels.
- Materials are not introduced to the farm that would impact the organic land capability values of the property.
- Biosecurity is maintained.
- Any farm infrastructure including windbreaks are reinstated.

8.4.5 Horse breeding, training and spelling

Horse enterprises along the alignment have specific arrangements of corrals (fencing types) and arena, training facilities.

Horses are sensitive to noise, visual disturbance (e.g., unsecured stored materials, loose tarpaulin or rubbish). Horses have high water requirements and access to water and stock fodder systems needs to be maintained.

Horse enterprises are expected to be able to be maintained throughout construction and operation providing that:

- Access to pastures, paddocks, corrals, stables and farm infrastructure is maintained for livestock movements and farm operations.
- Paddock rotations are considered in the construction planning.
- Soils are appropriately reinstated so that pasture growth resumes to pre-construction levels.
- Any farm infrastructure including windbreaks are reinstated.
- Construction noise and lighting does not startle the horses.
- Construction materials to be stored securely,

8.5 FORESTRY IMPACTS

Impacts on values for forestry activities may occur through the following impact pathways:

- Temporary restrictions on plantation access and harvesting activities.
- Restrictions on plantation harvesting practices caused by the transmission infrastructure.

- Loss of wood stock from permanent clearing of trees.
- Reduced wood flows from permanent clearing of trees or pre-mature harvesting of trees.
- Loss of wood stock and reduced wood flow from introduced diseases (plant pathogens such as *Phytophthora cinnamomi*, which is more commonly known as dieback).
- Loss of wood stock and reduced wood flow from fire damage to trees.

8.5.1 Temporary restrictions on plantation access and harvesting activities

The construction corridor will be 20 – 36 m wide (AOD) during the construction period to facilitate land cable installation and be temporarily unavailable for forestry activities. The estimated area of disturbance is based on the width of the construction corridor plus visual assessment (from aerial photography) of additional land that would be lost through temporary severance (e.g., where the alignment cuts off the corner of a paddock which is then also inaccessible). An estimated 41.02 ha of forestry land if the Hazelwood converter station is used, or 68.38 ha if Driffield converter station is constructed that may be temporarily unavailable (removed from production) during construction.

Impacts to access and harvesting activities will be addressed in a specific property management plan (EPR A02) for the plantation.

8.5.2 Restrictions on plantation harvesting practices

The easement will permanently remove an area from production along some plantation coupes. This will reduce the area of land capable of and suitable for plantation forestry within the plantation estate. An estimated 34.52 ha (for Hazelwood converter station option) or 30.03 ha (for Driffield converter station option) of forestry land will be subject to the easement. The loss will be offset by compensation through easement acquisition or alternative timber sources or both. Table 4-1 reflects the preliminary proposed types of restrictions to be placed on use and development of the land in the proposed easements. Further detail will be developed to minimise impacts on a property-by-property basis, during development of property management plans (EPR A02).

8.5.3 Loss of wood stock from permanent clearing of trees

Reduced income and increased costs from loss of wood stock, pre-mature harvesting and need to find more costly alternative wood supplies. The loss will be offset by compensation through easement acquisition or alternative timber sources or both.

8.5.4 Reduced wood flows from permanent clearing of trees or pre-mature harvesting

Wood flow from plantations will be affected until alternative stocks of suitable age are identified or brought into production and wood flow planning adjusted to incorporate the alternative sources. Reconfiguration of plantation coupes will take at least one planting, growing, and harvesting cycle to be integrated in the plantation plan and replace lost resources. These temporary impacts will be offset by compensation through easement acquisition or alternative timber sources or both.

8.5.5 Loss of wood stock and reduced wood flow from introduced diseases

There is the potential for diseases to be spread to properties from neighbouring areas, roadsides, and movement of plant, machinery vehicles along the alignment from inside and potentially outside the study area. Biosecurity protocols (EPR A02) will be developed and implemented during construction for each property specific to the forestry activities being undertaken.

8.5.6 Fire damage

There is the potential for fire to occur during construction or operation that could result in loss of wood and subsequent loss of wood flow in affected areas. The risk of bushfires occurring across the project alignment, and including the forestry area, has been assessed separately in the Bushfire Assessment (EIS/EES Technical Appendix M). This assessment has recommended EPRs for bushfire prevention and management for the project, including the forestry area.

As part of the Construction Environmental Management Plan developed by construction contractors, there will be protocols to avoid casing bushfires and to have onsite firefighting capacity where required. There will also be a Bushfire Emergency Management Plan develop and implemented for construction.

8.5.7 Summary of impacts on forestry

Forestry operations success is based on maintenance of wood flow, coupe size, servicing of wood supply contracts, maintenance of harvesting operations including non-impeded access from the road of active work sites and maintenance of non-active work sites. Access tracks and roads for logging and forestry operations must be maintained.

Forestry operations are expected to be able to be maintained throughout construction and operation providing that:

- Access to forestry infrastructure and plantations is maintained for forestry operations.
- Plantation rotations are considered in the construction planning.
- Soils are appropriately reinstated on temporary work sites so that plantation growth resumes to pre-construction levels.
- Any forestry infrastructure is reinstated.
- Fire risk is considered and managed by the construction contractor.

The EPRs presented in Table 8-15 are proposed to minimise the significance of potential forestry impacts.

Table 8-15 Environmental performance requirements: forestry

EPR ID	Environmental performance requirement	Project stage
A01	Complete property condition surveys prior to construction	Construction
A02	Develop and implement property management plans to avoid or minimise impacts on agricultural and forestry properties	Construction
A03	Develop and implement property soil management plans to avoid or minimise impacts on agricultural and forestry properties	Construction
A04	Develop and implement a rehabilitation strategy to avoid or minimise impacts on agricultural and forestry properties	Construction
A06	Develop and implement measures to avoid or minimise impacts on agricultural and forestry properties during operation	Operation

8.6 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 Marinus Link.
- Spatial boundary: the location, scale and nature of the other approved or committed projects expected to occur in the same area of influence as Marinus Link. The area of influence is defined at 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 Windfarm.
- Star of the South Offshore Windfarm.
- Gippsland Renewable Energy Zone Project (G-REZ). G-REZ is a proposed electricity transmission infrastructure project, aiming to provide a shared grid connection for renewable energy projects in Gippsland, including the offshore wind farms proposed within the Gippsland offshore wind development zone.
- Hazelwood Mine Rehabilitation Project.
- Wooreen Energy Storage System.

The projects relevant to this assessment have been determined based on the potential for cumulative impacts to agriculture and forestry values. Projects assessed as relevant to this assessment are:

- Delburn Windfarm
- Star of the South Offshore Windfarm.
- Gippsland Renewable Energy Zone Project (G-REZ).

The primary concern regarding cumulative impacts is the area impacted within forestry operations. This is because individual agricultural landowners are generally not exposed to concurrent projects with similar impacts, but the much larger forestry operations are.

The alignment will avoid the Delburn Wind Farm but may aggregate at the same convertor station. At this stage the area of HVP plantation land required for underground cables for the Delburn Windfarm is unknown. While the construction period of this project is like the project, the Delburn Windfarm has a design life of 25-30 years and will therefore potentially reach a decommissioning phase 10-15 years earlier.

Both Star of the South and G-REZ are in the planning phase but are likely to require access to HVP plantation land to accommodate their respective project alignments.

A high-level estimate (informed by paper and online mapping and referral documentation as to alignment), of HVP plantation land likely to be impacted is provided below:

- 28 ha Delburn Windfarm
- 300 ha Star of the South

- 255 ha Gippsland Renewable Energy Zone.

Hazelwood Mine Rehabilitation Project is not expected to have cumulative impacts on agriculture and forestry values because the project is rehabilitating land which has been used for mining, not land which is used for either agriculture or forestry.

Wooreen Energy Storage System is not expected to have cumulative impacts on agriculture and forestry values because, although the proposed site is located directly adjacent to the Marinus Link Hazelwood converter station site, the current land use at the proposed Wooreen site is neither agricultural nor forestry. Approximately half of the proposed Wooreen Energy Storage System site is already industrialised, and the other half is owned by a plantation company but not presently used for forestry.

9. ENVIRONMENTAL PERFORMANCE REQUIREMENTS

Table 9-1 lists the recommended EPRs relevant to this agriculture and forestry technical report.

In addition to the agriculture EPRs, a range of other EPRs will also mitigate potential impacts on agriculture and forestry activities caused by the project. These include EPRs for the following disciplines:

- Air quality
- Bushfire
- Contaminated land and acid sulfate soils
- Electromagnetic fields
- Groundwater
- Land use and planning
- Social
- Surface water
- Noise and vibration
- Traffic and transport

A decommissioning plan will be prepared to outline how activities would be undertaken and potential impacts to agriculture and forestry managed. The plan would include addressing the issues covered in the agriculture EPRs for construction. The decommissioning plan is provided in EIS/EES Volume 5, Chapter 2 - Environmental Management Framework.

Table 9-1 Agriculture EPRs

EPR ID	Environmental Performance Requirement	Project Stage
A01	**Complete property condition surveys prior to construction** Prior to commencing project works complete property condition surveys for each property to be disturbed during construction to document existing conditions. The property condition surveys should document all key activities on the property and infrastructure that could be directly or indirectly impacted, whether within or adjacent to the construction corridor. This could include, but not be limited to: • Existing pasture or current crop. • Existing ground profile including levels and slope. • Existing drainage and surface water management. • The type and condition of fencing, gates and other farm infrastructure including but not limited to stockyards, stock water troughs, water supply systems, and temporary and permanent farm buildings. • The type (tree species) and condition of shelter belts and windbreak plantings. • The type and condition of access tracks and laneways including surface material, and culverts and bridges. The property condition survey should be supported by a photographic or video record. A property condition report must be prepared and a copy provided to the landholder manager.	Construction

EPR ID	Environmental Performance Requirement	Project Stage

A02	**Develop and implement property management plans to avoid or minimise impacts on agricultural and forestry properties**
	
	Prior to commencing project works on each agricultural or forestry property, develop a property management plan. The property management plan must outline property specific measures to avoid or minimise disruption to farm or forestry infrastructure, practices and operations to prevent reducing the carrying capacity of the property or its yield during construction and in operation.
	
	The property management plan must be informed by the property condition survey (EPR A01) and be prepared in consultation with the landholder. A property management plan may include:
	
	• Summary of existing farming practices and farm development plans relevant to project works.
	• Controls to minimise disturbance to farm infrastructure, farming practices, property operations and maintenance, activities that must occur seasonally for farming practices and plantations, forestry activities and practices. This must include consideration of:
	  ○ Impacts on grazing and crop growing practices
	  ○ Impacts on livestock management
	  ○ Forestry operations
	• Communication protocol reflecting preferences advised by the landholder, to be utilised by MLPL, contractors and any other relevant parties through construction of the project.
	• The communication protocol must include:
	  ○ Provision of a program of works for the property to the landholder at least one month prior to activities commencing on that property.
	  ○ If the program of works is not continuous, the arrangements to manage and maintain worksites between staged construction activities will also be communicated.
	  ○ Notification timeframes and nominate MLPL and principal contractor representatives responsible for managing access and responding to agricultural landholder issues and complaints. The nominated person must be available to respond to landholder issues daily.
	• Details of access arrangements including:
	  ○ property entry and exit points for all construction, operation and maintenance vehicles,
	  ○ no go areas
	  ○ maintenance of landholder access to farm or forestry operation areas and farm infrastructure
	  ○ maintenance of stock, landholder access to water supplies (or alternatives provided)
	  ○ limits on timing and duration of access to a property.
	• Location, construction method, material type (including materials to avoid damage or injury to stock), duration of use (i.e temporary or permanent), maintenance responsibilities and requirements, and requirements for removal of temporary access tracks.
	• Measures to avoid, so far as reasonably practicable, impacts on land capability outside the construction corridor, laydown areas and access tracks during construction.
	• Type and location of fences or barriers to demarcate the construction corridor and associated workspace, provide stock crossings and restrict stock access.
	• Farm water supply arrangements during construction including temporary diversion or realignment of water supply infrastructure or alternative water supply arrangements.
	• Measures to avoid impacts on tree protection zones including for isolated trees and stands, shelter belts and windbreak plantings.
		Construction

EPR ID	Environmental Performance Requirement	Project Stage

	• Measures to avoid impacts to farm infrastructure including services, sheds, feed store locations and other facilities.
	• Biosecurity controls to be implemented to prevent the introduction and spread of animal and plant pathogens, pests and weeds. Controls should be informed by a risk assessment for each property, comply with the requirements of the Catchment and Land Protection Act 1994 (Vic), and be developed in consultation with Agriculture Victoria.
	• Controls during wet weather to avoid damaging access tracks, infrastructure and paddocks.
	• Controls to minimise dust impacts on farmhouses and farm worker accommodation, farm water supplies fed by water collected from rooves, animal nurseries, animal handling facilities including stockyards and dairies, farm orchards and vegetable patches, crops and pasture, and solar panels. Controls to minimise and manage these impacts must be included in the construction dust management plan required by EPR AQ01.
	• For forestry properties, bushfire management protocols.
	• Requirements for progressive reinstatement and rehabilitation including:
	  ○ Reinstatement of farm infrastructure removed or altered to facilitate construction, to the same or better standard as outlined in the property condition report (EPR A01) or to a condition agreed with the landholder.
	  ○ Rehabilitation of soils and rehabilitation of land to the same gradient, drainage and condition as prior to construction and outlined in the property condition report (EPR A01), prior to construction or to a condition agreed with the landholder. Rehabilitation requirements must include details of seed, lime, gypsum and fertiliser type; mix of plants for revegetation, and consideration of cropping and grazing cycles, where relevant.
	• Process for review and revision of property management plans and property condition reports in response to changes identified during construction.
	The property management plans must be implemented during construction.	

A03	**Develop and implement property soil management plans to avoid or minimise impacts on agricultural and forestry properties**
	Prior to commencing of project works on each agricultural or forestry property, develop a property soil management plan in consultation with the landholder.
	Each property soil management plan must include the following, as a minimum:
	• How management of the soil horizons will be achieved during construction including delineation and separate stockpiling of soil horizons.
	• Measures to delineate and separate stockpiles of A and B horizon soils and any major delineation of the B horizon to avoid soil inversion and mixing.
	• Measures to avoid impacts on soil fertility through:
	  ○ stripping and separately stockpiling topsoil
	  ○ excavating and separately stockpiling subsoil
	  ○ managing topsoil and subsoil stockpiles to avoid erosion and mixing
	  ○ reinstating subsoil and topsoil based on documented soil horizons to avoid mixing
	  ○ compacting subsoils to 85% of in-situ soil strength to minimise slumping and erosion
	  ○ minimising soil compaction of topsoils
	  ○ deep cultivation during reinstatement to manage soil compaction and maintain soil moisture content.
	The soil management plan must be a sub plan to the property management plan for each property and be implemented during construction.
		Construction

EPR ID	Environmental Performance Requirement	Project Stage
A04	**Develop and implement a rehabilitation strategy to avoid or minimise impacts on agricultural and forestry properties** Prior to commencement of project works, develop a strategy for progressive rehabilitation of disturbed areas not being used for permanent infrastructure. The rehabilitation strategy must include: • Requirements for rehabilitation of soil, surface contours and drains damaged or temporarily diverted during construction. • Requirements for use of appropriate seeds and fertilisers for revegetation. • Criteria for successful reinstatement and rehabilitation and revegetation including soil capacity, pasture or crop health, and weed type and density. • Details of an inspection program to be completed for a minimum of two years after completion of rehabilitation, to determine the success of rehabilitation. Inspections are required quarterly in the first year, twice in the second year after the completion of rehabilitation, and within two weeks of storm events. • A procedure to manage locations where the success criteria has not been met and where additional work is required. The rehabilitation strategy must be implemented until the rehabilitation criteria are achieved for all properties where construction activities disturb ground.	Construction
A05	**Avoid impacts on organic farming certification** Prior to commencing project works on each certified organic farming property, develop measures to be implemented in construction to avoid impacts on organic farming and organic farming certification. These measures must be informed by advice provided or guidelines published by approved organic certifying bodies registered by the Australian Department of Agriculture, Fisheries and Forestry and be developed in consultation with organic farm landholders.	Construction
A06	**Develop and implement measures to avoid or minimise impacts on agricultural and forestry properties during operation** As part of the OEMP, develop measures to avoid or minimise impacts on agricultural and forestry properties. These measures must include: • Communication protocols with landholders to facilitate site access for inspection and maintenance activities. • Biosecurity protocols to prevent the introduction and spread of animal and plant pathogens, pests and weeds. • Protocols for accessing certified organic farms. • Measures for soil management and land reinstatement and rehabilitation in the event that excavations are required for maintenance. • Measures to avoid impacts to farming and forestry infrastructure, practices and operations during operation activities. • Bushfire management protocols.	Operation

10. CONCLUSION

The assessment considers the impacts of the project on agriculture and forestry. As most of the study area is freehold land used for agriculture and rural residential activities, or forestry and the project directly occupies agricultural properties in the AOD and easement areas, it is important to assess the impact to agriculture and forestry.

The key values assessed are land capability, and farm or plantation infrastructure, practices, and planning.

Key impacts to these values for agriculture include:

- Reduced productivity or yields from disturbance during construction.
- Reduced productivity or yields caused by degraded soil structure, soil moisture content and fertility.
- Reduced amenity or reduced productivity or yields from dust emissions and deposition.
- Impact on production caused by need to modify or adopt alternative agricultural practices.
- Lost or reduced production or lost or reduced yields through ineffective biosecurity controls leading to introduction or spread of animal or plant pathogen or noxious weed infestation.
- Reduced farm income due to constraints on farm development plans.

Key impacts to these values for forestry include:

- Loss of wood stock from permanent clearing of trees.
- Reduced wood flows from permanent clearing of trees or pre-mature harvesting of trees.
- Loss of wood stock and reduced wood flow from introduced diseases (plant pathogens such as *Phytophthora cinnamomi*, which is more commonly known as dieback).
- Temporary restrictions on plantation access and harvesting activities.
- Restrictions on plantation harvesting practices caused by the transmission infrastructure.

Residual impacts from construction activities on land capability for the agricultural production activities relate to the success of rehabilitation. Soil compaction, soil inversion and changed soil moisture content can affect rehabilitation success and productivity. Staged execution of the project will result in some farming practices being disrupted for up to four years. During this period alternative arrangements will be implemented to reduce impacts on production and operating costs.

Residual impacts from construction activities via the temporary relocation of farm infrastructure will be low, as affected farm infrastructure will be reinstated as soon as practicable following construction.

Operation and maintenance activities are unlikely to affect farm infrastructure, as the activities will be confined to cable joint pits or cable fault locations, which have relatively small footprints. The residual impact in operation for agriculture includes easement and land cables constraining farm development plans reducing options and flexibility in configuring paddocks and siting farm infrastructure to support diversified or alternative farming practices.

Six EPRs were determined to address potential impacts on agriculture and forestry from the project. After the application of appropriate management measures to comply with EPRs, residual impacts were assessed as low to moderate significance in the construction period and low to very low in the operation period.

The outcome of this assessment also considers there would not be any broad change of agricultural or forestry land use within or outside the project area due to the construction and operation of the project.

The project would not impact on the long-term vision for agricultural land use planning in the broader Gippsland region. This assessment concludes that the project would not result in unacceptable or long-term impacts to the existing agricultural practices within the study area.

Overall, any agricultural and forestry impacts would be localised and site specific. Impacts would be generally short-term and construction period related, such as short-term inconvenient movement within, and around a farming enterprise. The nature of agricultural activity will determine the level of disruption. While dust is part of a rural environment, increased dust generated during construction needs to be effectively managed to minimise impacts on agricultural activities, farmers and their families.

Long term soil health and land capability will sustain minimal impacts subject to implementing appropriate management measures to comply with EPRs. Rehabilitation will be critical to achieving that low level of impact. It is intended that land and infrastructure would be returned to its previous condition, including the rehabilitation of native vegetation to its pre-construction condition where these areas cannot be avoided.

Some farm and farming activities will require supplementary measures during the construction and post completion stages of the project to ensure ongoing operations. These measures could include an inspection program to be completed for a minimum of two years after completion of rehabilitation, to determine the success of rehabilitation.

Overall impacts will be manageable through working in consultation with landowners to manage the day to day running of the farm and address property specific issues. Part of this process is ensuring that property management plans capture the property specific requirements and are diligently implemented and adaptively managed. If potential loss of cropping cycles is identified further specific measures will be required to be implemented in agreement with the landowner to address any loss associated with the project.

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APPENDIX A: VICTORIAN DAIRY INDUSTRY FAST FACTS

VICTORIAN DAIRY INDUSTRY FAST FACTS JUNE 2021

AGRICULTURE VICTORIA

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3,471 ▼ 5.8%
Dairy farm businesses (2019-20)

8,100 ▼ 17%
Jobs in dairy industry (2020–21)

$3.0B ▲ 12.2%
Value of milk production (2019–20)

$2.10B ▲ 3.2%
Dairy exports (2019-20)

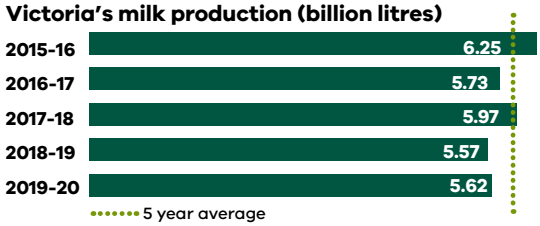
Herd facts and figures

- There were around 3,470 dairy farm businesses in Victoria in 2019-20, representing 63 per cent of the 5,500 Australian dairy farms.
- Victorian dairy farms are concentrated in Northern Victoria (32%), South-West Victoria (33%) and Gippsland (35%).
- There were a total of 1.5 million cattle in dairy farming in Victoria in 2019–20, comprising 883,000 cows in milk and dry, 295,000 heifers and 239,000 calves less than one year old. Victoria's herd size represents 62 per cent of the national dairy herd of 2.3 million head.

How much is produced?

- Victoria is Australia's largest dairy producing state, producing 5.62 billion litres of milk in 2019-20—close to two-thirds of Australia's milk production. Northern Victoria, South West Victoria and Gippsland dairying regions account for approximately 19 per cent , 22 per cent and 23 per cent of Australia's milk production, respectively.
- Victoria's milk production decreased by 10 per cent (630 million litres) between 2015-16 and 2019-20.
- Manufactured exports accounts for 29 per cent of milk produced in Victoria, while the remaining milk is used for domestic manufacturing (60%) and drinking milk sales (11%).

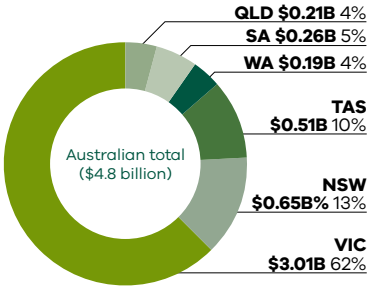
Victoria's milk production (billion litres)



What is the value of farm-gate production?

- The gross value of milk produced in Victoria was $3.0 billion in 2019–20, an increase of $330 million (up 12 per cent) on the previous year. Milk accounted for 17 per cent of Victoria's gross value of agricultural of production of $17.8 billion.
- Dairy industry is Victoria's second largest agricultural industry after horticulture ($3.60 billion), and closely above sheep meat/wool industry ($2.99 billion) and grains industry ($2.98 billion).
- Victoria contributed 62 per cent to the Australia's gross value of milk production estimated at $4.8 billion, cementing Victoria's position as the nation's largest milk producer.

Gross value of milk produced, 2019–20



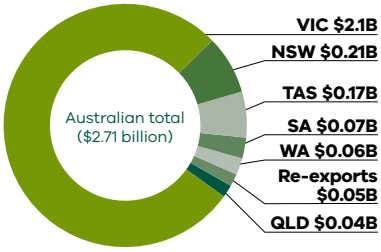
Sector employment

- It is estimated that approximately 8,100 persons work on farms that produce milk in the year to May 2021.

Exports and domestic consumption of dairy products

- Victoria's total dairy exports were valued at $2.1 billion in 2019-20, representing 18 per cent of Victoria's total food exports ($11.4 billion).
- Milk and cream products were the highest value dairy category, contributing 48 per cent of Victoria's dairy exports. Cheese and whey products were the second highest value category at $869 million (41 per cent of dairy exports).
- Victoria is the largest dairy exporter accounting for 77 per cent of Australia's total dairy exports ($2.7 billion).
- China is the highest value export market for Victorian dairy products ($576 million), making up 27 per cent of dairy export total value, followed by Japan ($419 million or 20%) and Indonesia ($151 million or 7%).
- Australia's annual per capita consumption of dairy products in 2019-20: drinking milk (97 litres), cheese (13.6 kilograms), butter (4.1 kg), and yoghurt (9.4 kg).

Australia's dairy exports by state, 2019-20



Prices

- In 2019-20, the milk price was above the five-year average ($5.94 per kilogram of milk solid, adjusted for inflation) with a range of $6.10 to $6.80/kg MS. This was supported by buoyant international commodity price and intense competition for milk supply among processors due to reduced milk production.

Farm financial performance

- ABARES projects average farm cash income for Australian dairy farms to increase slightly from an average of $187,100 per farm in 2019–20 to $190,000 in 2020–21. However, farm cash income is projected to decline slightly in Victoria, South Australia and Tasmania.
- Farm business profit is projected to increase slightly more due mainly to increase in dairy cattle numbers. Nationally, farm business profit is projected to increase from an average of $60,800 per farm in 2019–20 to $66,000 in 2020–21.
- A lower cost of production will promote supply growth and aid profitability in 2021.

APPENDIX B: VICTORIAN BEEF INDUSTRY FAST FACTS

VICTORIAN BEEF INDUSTRY FAST FACTS JUNE 2021

AGRICULTURE VICTORIA

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10,048 ▲ 4.3%
Beef farm businesses (2019-20)

18,800 ▲ 1.1%
Jobs in beef industry (2020–21)

$2.9B ▲ 22.9%
Value of beef production (2019–20)

$2.3B ▲ 26.4%
Beef and veal exports (2019-20)

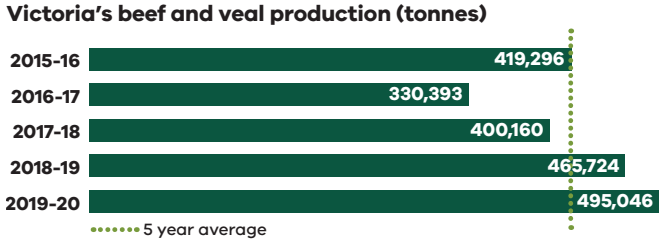
Herd facts and figures

- Victoria's beef production is predominantly located in the Western District, Gippsland, Ovens Murray and Goulburn regions.
- There were 10,000 beef cattle farm businesses in Victoria in 2019–20, representing 23 per cent of the national beef cattle farm businesses.
- Victoria's herd size was 2.0 million of beef cattle accounting for 10 per cent of Australia's herd of 21.1 million.
- Victoria's herd comprise 1.4 million head of beef cows and heifers (one year and over) and 600,000 calves less than 1 year old.
- Victoria has the third largest population of beef cattle after Queensland (10.4 million) and NSW (3.6 million).

How much is produced?

- In 2019-20, Victoria processed 1.8 million adult cattle and 300,000 calves, producing 495,000 tonnes of beef and veal (489,000 tonnes of beef and 6,000 tonnes of veal).
- Victoria contributes 21 per cent of Australia's beef production (2,374,000 tonnes).
- Victoria is the third largest beef and veal producer after Queensland (1.1 million tonnes) and NSW (516,000 tonnes).
- Between 2018-19 and 2019-20, Victoria's beef and veal meat production increased by 30,000 tonnes, an increase of 6 per cent.

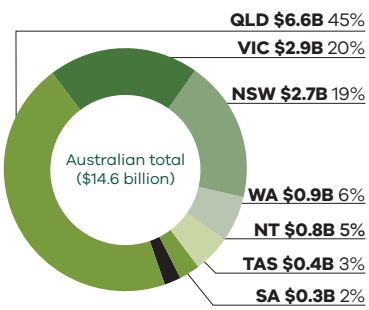
Victoria's beef and veal production (tonnes)



What is the value of production?

- The gross value of Victorian cattle and calf production for meat in 2019–20 was estimated at $2.9 billion. Cattle for meat are estimated to have contributed 16 per cent of Victoria's gross value of agricultural production of $17.8 billion.
- Beef industry is Victoria's third largest agricultural industry after horticulture ($3.1 billion), and dairy ($3.0 billion).
- Victoria contributed 20 per cent to Australia's gross value of cattle and calf production estimated at $14.6 billion.

Gross value of beef and veal production, 2019-20



- The gross value of red meat manufacturing in Victoria, including beef and sheep meat, is approximately $4.4 billion.

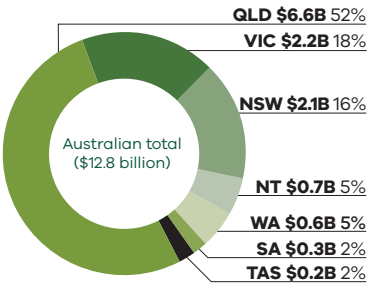
Industry employment:

- It is estimated that around 18,800 people worked on farms that produce beef as the main commodity in the year to May 2021.

Exports and domestic consumption of beef products

- The value of Victoria's total beef and veal exports in 2019-20 was $2.25 billion, representing 48 per cent of all meat products exports.
- Victoria exported 272,000 tonnes of beef and veal valued at $2.14 billion, and 19,000 tonnes of live cattle exports valued at $111 million.
- Beef exports contributed 20 per cent to Victoria's total food exports ($11.4 billion).
- Victoria is the second highest beef exporter after Queensland—contributing 18 per cent to Australia's total beef exports ($12.8 billion).
- The United States was the highest value beef export market valued at $726 million, followed by China ($427 million), and Japan ($311 million). These three markets accounted for 65 per cent of Victorian beef exports.
- Australians ate around 24 kilogram of beef per person in 2019–20.

Australia's beef exports by state, 2019-20



Prices:

- The Eastern Young Cattle Indicator (EYCI) performed strongly from 548 c/kg in January 2020 to 930 c/kg as of 25 June 2021. Cattle prices continue to be supported by competition between processors and farmers looking to restock.

Farm financial performance

- ABARES reported improved farm financial performance of livestock farms in 2020–21. Better seasonal conditions resulted in reduced expenditure on fodder, higher receipts from beef cattle but lower receipts for sheep, lambs and wool because of a focus on flock rebuilding due to improved seasonal conditions.
- For specialist beef farms, average farm cash incomes increased by around $6,500 to $64,000 in 2020–21, with a combination of increased cattle sales, higher beef cattle prices and lower fodder costs.
- Farm business profit increased by $24,500, from an average of negative $28,500 in 2019–20 to negative $4,000 in 2020–21.
- Softening restocker demand and global pressures to see prices ease in 2021.

APPENDIX C: VICTORIAN HORTICULTURAL INDUSTRY FAST FACTS

VICTORIAN HORTICULTURE INDUSTRY FAST FACTS JUNE 2021

AGRICULTURE VICTORIA

Agriculture Policy I Contact: Francis Karanja — francis.b.karanja@agriculture.vic.gov.au

2,850 ▲ 3.0%
Horticulture farm businesses (2019–20)

15,400 ▲ 10.2%
Jobs in horticulture industry (2020–21)

$3.13B ▲ 5.8%
Value of horticulture production (2019–20)

$1.6B ▲ 1.9%
Horticulture exports (2019-20)

Horticulture farms facts and figures

- These fast facts are limited to horticultural produce for human consumption (nurseries, cut flowers or turf are not included).
- There were around 2,900 horticulture farm businesses in Victoria in 2019–20: including 980 fruit and nuts, 310 table and dried grapes, 810 wine grapes and 740 vegetable farm businesses. Horticulture farms account for 13 per cent of Victoria's farm businesses.
- Around 21 per cent of Australia's horticulture farm businesses are located in Victoria.
- The 2,900 farms operate on approximately 106,900 hectares (or 24% of Australia's horticulture farms area).

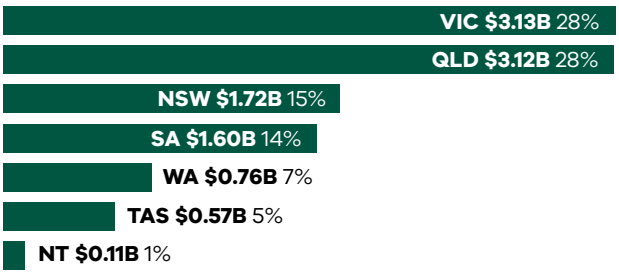
How much is produced?

- Victoria produced around 1,400 kilotonnes (kt) of horticultural produce in 2019–20 comprising 480 kt of fruit and nuts, 100 kt of table and dried grapes, 200 kt of wine grapes and 700 kt of vegetables. Victoria accounts for 26 per cent of Australia's 5,600 kt horticulture produce and is the largest horticulture producer in Australia.
- Victoria is also Australia's largest fruit and nuts producer accounting for 35 per cent of the national production; number one producer of table and dried grapes contributing 70 per cent of Australia's table and dried grapes production. Victoria is the third largest producer (after SA and NSW) of wine grapes accounting for 14 per cent of Australia's wine grapes production and the largest vegetables producer accounting for 25 per cent of national vegetables production.
- Victoria is also Australia's largest fruit and nuts producer accounting for 91 per cent of peaches, 85 per cent of nectarines, 74 per cent of olives, 67 per cent of almonds, and 48 per cent of apples.

What is the value of production?

- The gross value of Victorian horticulture sector was around $3.13 billion in 2019–20, up 5.8 per cent from the previous year. Horticulture production contributed 18 per cent of Victoria's agricultural production value of $17.8 billion.
- Gross value of Victoria's major horticultural commodities included $1.5 billion from fruit and nuts, $418 million from table and dried grapes, $114 million from wine grapes and $1.1 billion from vegetables.
- Victoria contributed 28 per cent to the national gross value of horticulture production of $11.1 billion.

Gross value of horticulture production, 2019–20



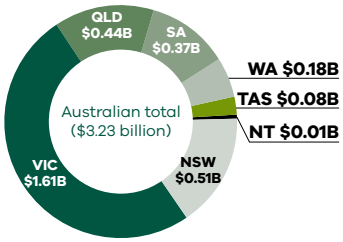
Sector employment:

- The industry employs 15,400 people, with an additional 6,000 consultants and year-round casual workers, plus a seasonal workforce which peaks at around 20,000 in most years pre-coronavirus (COVID-19) pandemic.

Horticulture exports performance

- In 2019-20, Victoria's total horticulture exports were valued at $1.6 billion. Victoria's horticulture exports represent 14 per cent of Victoria's total food exports ($11.4 billion).
- Fruit exports increased by $84 million (10 per cent) to be valued at $904 million in 2019-20. Table grapes recorded the largest growth in export value, increasing by $59 million (12 per cent) to a record $562 million. Nuts exports declined by 13 per cent ($69 million) to be valued at $463 million. Victoria contributed 70 per cent to Australia's almonds exports. Vegetable exports were valued at $55 million.
- Victoria is the largest horticulture exporter accounting for 50 per cent of Australia's total horticulture exports valued at $3.2 billion.
- China was the highest value horticulture export market valued at $646 million (or 40 per cent of horticultural exports), followed by Japan ($102 million) and New Zealand ($86 million).

Australia's horticulture exports by state, 2019-20



Farm financial performance

- Vegetable-growing businesses have on average remained profitable during the last 5 years to 2019–20, though profitability varies widely. The average profit for vegetable-growing business was $245,000 in 2018–19, decreasing by 11 per cent from $276,000 in 2017–18.

Outlook

- Nationally, gross value of horticultural production was forecast in December 2020 (by ABARES) to increase to 15 per cent above the five-year average during 2020-21. The value of vegetable production is forecast to be 14 per cent above average in 2020-21, while the value of fruit and tree nut production was forecast to increase to be 18 per cent above average.
- The forecast growth in the value of horticultural production is expected from an increase in demand for horticultural produce.
- The forecast increase in the prices of horticultural output will increase the revenues of producers.
- Seasonal conditions and input prices other than labour are also largely supportive for profitable horticulture production in the foreseeable future, including water and finance costs.
- In 2020–21, the value of horticulture production is forecast to fall slightly due to small price falls.

APPENDIX D: RELEVANT EXTRACTS FROM POTATO GROWERS' BIOSECURITY MANUAL

Potato Growers' Biosecurity Manual

A guide to farm biosecurity measures to reduce the risks of pests, diseases and weeds impacting your production

Version 1.0 May 2018

Plant Health AUSTRALIA

AUSVEG

Hort Innovation Strategic levy investment | POTATO – FRESH FUND

Hort Innovation Strategic levy investment | POTATO – PROCESSING FUND

Biosecurity overview

By implementing the recommended measures in day-to-day operations you will improve your farm's biosecurity and that of your region, minimising crop losses and additional costs.

Image courtesy of AUSVEG

The risk is real

Potato growers face different types of biosecurity risks:

- **Exotic pests and diseases** – that are not in Australia yet (pages 36–44).
- **Regionalised pests and diseases** – that are already in Australia but are restricted to particular regions or can be kept off your farm through biosecurity practices (pages 45–52).

On-farm biosecurity practices like those in this manual will help to protect your property from biosecurity risks.

Why on-farm biosecurity matters

On-farm biosecurity practices help to protect you from weeds, established pests and diseases and, in the event of new pest entry into Australia, from exotic pests.

These practices make good business sense since new pest entries reduce yield and increase production costs. In the case of potato cyst nematode (page 21) good biosecurity contributed to its eradication from Western Australia and containment of the pest in Victoria.

In addition to being best practice, state legislation is changing to make it a legal requirement that everyone, including potato growers, reduce risks under their control. See page 7 for information on new laws already in force in Queensland and NSW. Other states and territories are expected to follow suit.

Protecting market access

Biosecurity is also crucial for protecting markets for your produce. The presence of weeds, pests and diseases can mean that certain markets will not be willing to receive products grown in particular regions.

These might be interstate buyers in regions that are free from the threat, or overseas markets.

Maintaining a favourable pest status underpins the future profitability and sustainability of the Australian potato industry.

Area wide management

Since weeds, pests and diseases can spread to your property from neighbouring areas, it makes sense to work with others on regional approaches to pest management wherever possible.

Pests, diseases and weeds can be harboured in the backyards of nearby towns where potatoes and other Solanaceae crops are grown. Other nearby properties may also pose a risk, especially abandoned or neglected farms. Sometimes native vegetation can host pests and diseases as well.

It pays to contact others in your area to develop a shared understanding of local threats and local expertise or resources that can help.

On-farm biosecurity is most effective if all practices are of a high standard and adhered to. Failure to carry out a single practice can potentially lead to the introduction of a new pest or disease.

Biosecurity is the management of risks to the economy, the environment and the community, from new pests, diseases and weeds entering, establishing and spreading.

The presence of weeds, pests and diseases can mean that certain markets will not be willing to receive products grown in particular regions.

Every potato growers' responsibility

The following pages suggest ways to reduce the vulnerability of your enterprise. Every farm is different, so the general principles described here will need to be tailored to your needs.

It is useful to start with a map of your property to consider risk areas, and the best places to locate biosecurity zones and checkpoints.

This could include signs at entrances to the property, parking areas near the house or site office, the location of deliveries and pick-ups in relation to storage facilities, vehicle wash-down areas, and existing roads or tracks for movement within the property. Think about what you can do to minimise the risk of introducing diseases, pests and weed seeds at each point.

The priority should be to minimise the biosecurity risks in the production areas.

On pages 26–33 there is a **Biosecurity Checklist** that will help you to assess the strengths and weaknesses of your current arrangements and plan improvements.

The checklist provides three levels of biosecurity activities – baseline, industry standard and above industry standard – to allow for continual improvement in practices. Any legal requirements are also stipulated.

The practices you choose may vary from paddock to paddock, depending on factors such as the size and location of your property, the facilities available, and the risks that need to be addressed.

Limit access to areas known to be clean to stop them becoming infected. In particular, apply rules for vehicle and equipment movements in production areas known to be infected to stop further spread of pests or weeds.

The **pests and weeds of greatest concern to potato growers** are described at the back of this manual, beginning with exotic pests on page 36. Each pest summary indicates how the weed, pest or disease threat can be managed through biosecurity practices.

Exotic pests are those not currently present in Australia. **Established** pests are already within Australia although some are contained to particular regions.

The biosecurity essentials

When thinking about implementing biosecurity measures on farm, the six biosecurity essentials are a good place to start. They are:

1. People, vehicles and equipment
2. Farm inputs
3. Production practices
4. Farm outputs
5. Feral animals and weeds
6. Train, plan and record

The Farm Biosecurity website has a series of short videos on the six biosecurity essentials that show how easy it can be to implement simple but effective biosecurity measures on your farm. Go to **farmbiosecurity.com.au/videos**.

Movement of people poses a particular risk to your farm because weeds and some plant pests and diseases can be spread in soil and plant material which can stick to tyres, truck bodies, trays, as well as crates and bins.

Farm biosecurity practices

This section outlines the recommended biosecurity practices for all potato growers.

Every farm is different. Assess the strengths and weaknesses of your current arrangements using the Biosecurity Checklist on pages 26 to 33.

Image courtesy of Vin Bowie Farm Machinery

People, vehicles and equipment

People, vehicles and equipment can carry diseases, insects and weed seeds onto and around your farm.

Inform visitors of your biosecurity requirements

Make sure that staff, regular visitors, and anyone else entering your property knows about your biosecurity requirements.

Biosecurity signs, like those available from **farmbiosecurity.com.au** or **ausveg.com.au**, help to control movement onto and around your property. Signs can be obtained by contacting AUSVEG, or the file can be downloaded for printing locally.

Signs at the main entrance to your property alert visitors to the need to comply with the measures you have in place. Other signs can show visitors where to park and where to clean down their vehicle or equipment, if needed.

Consider erecting signs in another language if regular visitors are speakers of languages other than English. Khmer and Vietnamese signs can be obtained from **ausveg.com.au**.

When new staff or groups of people arrive, hold an induction session to explain biosecurity measures in place on the farm. This can include workplace health and safety as well as biosecurity requirements, including specific detail relating to the areas of the farm they will access.

Make sure workers know about any biosecurity risks in the region or issues on the property. They should also be familiar with pests commonly found on the property and know how to report anything unusual.

If you hold events on your farm, such as field days, equipment demonstrations or research trials, clearly indicate any entry requirements and be especially vigilant in checking for new pests and diseases afterwards.

Truck drivers may not be aware of the risks associated with their load or with the movement of their vehicles into different areas. Signage and registers can help everyone to be more informed about the risks.

Use a visitor register

It is good practice to maintain a visitor register to document who has been on your property, where they have come from, and where they are going on the farm and after they leave. This can serve as a health and safety function, and potentially improve on-farm biosecurity.

Visitor or contractor records are useful tools in the event of a new pest entry into Australia or a new region within Australia because they can allow investigators to trace the origin and spread of a pest or disease.

A visitor register template can be obtained from **farmbiosecurity.com.au** or **ausveg.com.au**.

If your agronomist has visited 10 other properties before arriving on yours, what might their boots and tyres be bringing to your farm?

Control access by people

Controlling and limiting access to production areas such as paddocks is the best way to minimise biosecurity risks from the movement of people.

Visitors include farm contractors, consultants or agronomists, backpackers, employees of utility providers and research personnel. Busloads of visitors such as grower groups or students might also require special precautions.

Ideally, there should be only one access point to the property. This makes it easier for you to monitor and control the movement of people. Boundary fencing and gates are recommended to help control access.

Providing a designated parking area away from production areas and asking all visitors to let you know when they arrive will also help you to manage who is coming onto your property.

Assess the risks that each visitor poses. Get into the habit of asking visitors where they have been recently and take actions appropriate to the risk, as explained on the following pages.

If you cannot reduce the risk presented by a visitor by implementing some of the suggestions outlined in this manual, you can refuse access to your property.

Take particular care with high risk visitors – anyone who has recently arrived from overseas, particularly from rural areas, people who have travelled from another potato farm, and any visitor who moves from farm-to-farm and region-to-region.

Ask all visitors to stay on paths and designated roadways as much as possible when moving around the farm.

Also consider how to manage people who come on farm to buy produce. Appropriate signs might be required to manage this risk.

Limit machinery and equipment entry to your farm

Any machinery coming onto your property poses a risk of spreading pests and weed seeds. This is particularly the case with contractors involved in harvesting, planting or fertilising who have travelled from farms where potatoes are grown. Don't forget about machinery that is being used for other activites such as sowing, spraying or harvesting other crops as part of a rotation.

If sales people want to demonstrate machinery on your farm it is essential that the machinery is washed down and disinfected before it arrives on farm as this type of scenario poses significant risks.

You have the right to ask contractors to clean machinery before entering (and leaving) your farm.

Another alternative is to only engage contractors who are signatories to an industry recommended hygiene protocol or program.

To ensure that your property does not become the source of new pests for others, you have a responsibility to inform visitors of any declared or notifiable pests present on your farm, so that they can take steps to avoid transferring them to the next property.

The person who reads the water meter on your irrigation system could be a significant risk to your business if they don't undertake appropriate clean down activities prior to coming onto your property.

Use signs to direct visitors to designated parking or reception areas. Access to production fields should be limited to a restricted range of personnel only.

Limit vehicle movements in production areas

It is often impractical to stop all movements of vehicles onto and around the property, but there are steps you can take to minimise the risks that they pose.

Best practice is to make sure that all vehicles are either restricted to a designated parking area or cleaned before entering production areas. Having a parking area on the property allows you to inspect a vehicle and decide what, if any, action you need to take. Get into the habit of doing a quick and simple risk assessment for vehicles and equipment by asking the operator where they have been recently.

Wherever possible, use dedicated farm vehicles to move through production areas. A dedicated farm vehicle should stay on farm, to minimise the risk of bringing a pest back with it if it leaves the property. Otherwise provide a wash-down facility to clean vehicles before allowing access to production areas.

Establish zones around your farm and limit access according to the risk status of the area. Limit access to areas known to be clean to stop them becoming infected. In particular, apply rules for vehicle and equipment movements in production areas known to be infected to stop further spread.

Any equipment that moves from farm-to-farm and region-to-region and accesses your production areas is an increased biosecurity risk to your property. This could include harvesters and contract sprayers.

Non-production vehicles should stay on designated roadways as much as possible when moving around the farm.

Without signage, visitors and staff may be unaware of the biosecurity procedures enforced on your property.

Clean boots and clothes

Since weed seeds and pathogens like rusts can enter on people's footwear and clothing, it helps to have a policy of clean clothes and boots for employees and visitors.

Boots present more of a risk than clothes because they have direct contact with the soil. Provide hot soapy water, scrubbing brushes and disinfectant for people arriving with muddy boots, or give them boots to wear while in your production areas. People should also use a footbath when leaving your property.

People who have recently returned from overseas pose an increased potential risk, particularly if they have been in regions where potatoes are grown and exotic pests are present. Make sure that they have clean footwear and clothes before entering your farm.

Additional protective measures may be required in areas contaminated with pests or diseases to limit further spread. Provide hygiene supplies such as hand sanitiser, gloves, disinfectant foot scrubbers, disposable over boots and overalls for use where appropriate.

Foot baths are a simple way to manage biosecurity risks associated with soil-borne pests and weed seeds being carried in dirt and mud. Footbaths need to be maintained well to be effective. See **farmbiosecurity.com.au/biosecurity-basics-make-your-own-footbath**.

Pests, disease causing organisms and weed seeds can be present on hands, clothing, footwear and personal items.

Establish wash down and disinfecting facilities

All vehicles and equipment entering production areas can be easily cleaned using high pressure water and a detergent/degreaser such as Bio-Cleanse™ or compressed air.

Locate a wash down area between the driveway and farm roads, and away from production areas. A sealed (concrete or bitumen) surface or a pad of packed gravel is ideal, with a sump to collect waste water and debris. Make sure mud, soil and plant material are kept away from crops, storage areas and waterways.

Inspect the area around the wash down facility regularly for the presence of pests or weeds, and treat or report as required.

The wash down area may be the same as that used for chemical wash down of vehicles and equipment since both require a separate waste water holding pond. If so, all occupational health and safety issues associated with chemical wash down areas must be taken into account.

Washing all planting and harvesting equipment with a detergent/degreaser such as Bio-Cleanse™ and water, and then disinfecting with a product such as Sporekill™ or Virkon™ will provide additional protection from potato diseases.

95 per cent of the job of washing a vehicle to decrease the biosecurity risk is in getting the mud off. A disinfectant or sanitiser finishes the job off.

Washing down your tractor and sprayer regularly keeps dust from building up and caking onto electronics, keeps mud off the roads and decreases the risk of spreading pests and diseases of potatoes.

Wash down bay designs

In the wake of the entry of Panama disease tropical race 4, (a non-eradicable disease of bananas) in Northern Queensland in 2016, Biosecurity Queensland's Panama TR4 Program developed some new wash-down bay designs for growers.

The designs are ideal for use by potato growers since Panama TR4 is a soil borne disease, which makes it similar to bacterial wilt of potatoes (page 50).

For more information go to Wash-down designs to combat Panama disease tropical race 4 **farmbiosecurity.com.au/wp-content/uploads/Wash-down-designs-for-TR4.pdf**

Automatic wash down areas are both easy and efficient systems to use. Costs are higher with these systems than non-automated ones, but improved protection from soil borne diseases may be had (if designed and maintained well) due to greater contact of water with the under side of the vehicle.

The wash down facility illustrated below is designed for vehicles with a medium to high level of soil and plant contamination. Vehicles are submerged up to the axles and some of the underbody, and a high pressure hose is provided for specific washdown of other parts of the vehicle or machinery as required.

This type of wash down bay should be used for all vehicles and machinery entering the property, so it needs to be wide enough for a B-Double to pass through.

Use a disinfectant solution that kills the bacterial or fungal pests you're trying to keep off your farm, but that is also safe for regular use on your vehicle and machinery. Speak to your agronomist or ag-reseller to find a suitable product.

An automatic vehicle wash down bay provides protection against soil borne diseases.

Used with permission, from Wash-down designs to combat Panama disease tropical race 4, Queensland Department of Agriculture and Fisheries, 2017

Feral animals and weeds

Feral animals pose a risk to your property through direct impact on production but can also carry diseases, pests and weed seeds onto and around your property.

Vermin such as rats can damage crops, spread animal diseases and contaminate water sources. Weeds too, are a significant problem in their own right, reducing yields.

In addition to their direct effects, feral animals and weeds can spread and harbour plant pests and diseases, providing additional reasons to manage them.

Wild and feral animal access

Feral and wild animals pose a particular threat to potato production because many diseases are spread in soil, which animals may take with them when they move to other properties.

Fencing that prevents animal movements will provide some protection. It is therefore important to check and mend broken boundary fences.

Develop and implement an integrated wild and feral animal control program. For best results, work with neighbours and other growers in your local area to implement a coordinated approach to feral animal control.

Ensure farm buildings are in good repair and remove any sources of feed for animals. Dispose of any animal carcases properly and promptly.

Volunteer plants and weeds

Weeds, especially Solanaceae species such as night shade, and volunteer potato and other crop plants that have escaped from production areas can create a 'green bridge' that can harbour pests or diseases between seasons. Pests then have the potential to infect the early stages of growth of the next crop.

Where necessary, control volunteers and weeds within the paddock and externally, such as along roadways and boundary fence lines.

Establish a weed management plan for your property, including plans to eradicate, contain or manage current weeds on your property, and to prevent the introduction of new ones.

You are likely to need a combination of practices to manage existing weeds, including herbicides and cultural practices like strategic tillage and farm hygiene.

Property and land damage

Fires, floods and storms can provide an opportunity for pests and weeds to become established, and for feral animals to enter.

Make regular inspections of your property for the presence of diseases, pests, weeds and feral animals.

Pay particular attention to areas that have been recently excavated such as new roads or dams and anywhere that has been damaged in storms or flooding. Keep an eye out for new weeds in the areas where flood waters may have run across your land from neighbouring properties and treat them before they flower and produce seeds.

Train, plan and record

Make sure that biosecurity procedures and threats are included in staff training and that biosecurity is part of farm planning activities. Record keeping is also an important part of managing your business, providing the ability to trace where planting material and other inputs came from and where produce goes.

Train staff

Since many people are not aware of how easily diseases, pests and weeds can spread, anyone coming onto your property, particularly into your production areas, needs to be informed. It's important that everyone who comes onto the property, including staff, friends, family and contractors, are aware of the risks, and know about your procedures to prevent the spread of biosecurity risks.

Inform staff of the biosecurity standards they need to adhere to, and provide formal training or instruction if required. Staff can help monitor crops and keep an eye open for any problems but education is important in preparing them to do this well.

Make sure employees and family members keep a lookout for unusual pests. In particular, make sure that they can recognise established and key exotic pests, and that they know how to report them.

This is especially important for people working on grading lines. Any pest or disease damaged potato not suitable for sale should be brought to the attention of a supervisor and, if necessary, be referred for outside advice.

If the damage is suspected of being the result of an exotic pest the exotic plant pest hotline should be called on 1800 084 881.

Posters in sheds featuring established and exotic pests can build awareness and serve as a reminder.

If you build your farm biosecurity measures around daily, monthly or yearly farm routines, then it should become a habit which is easily maintained.

Planning is an essential part of integrating biosecurity into your everyday farm activities.

Make a biosecurity plan for your property

An on-farm biosecurity plan will help you prioritise the implementation of biosecurity practices relevant to your property.

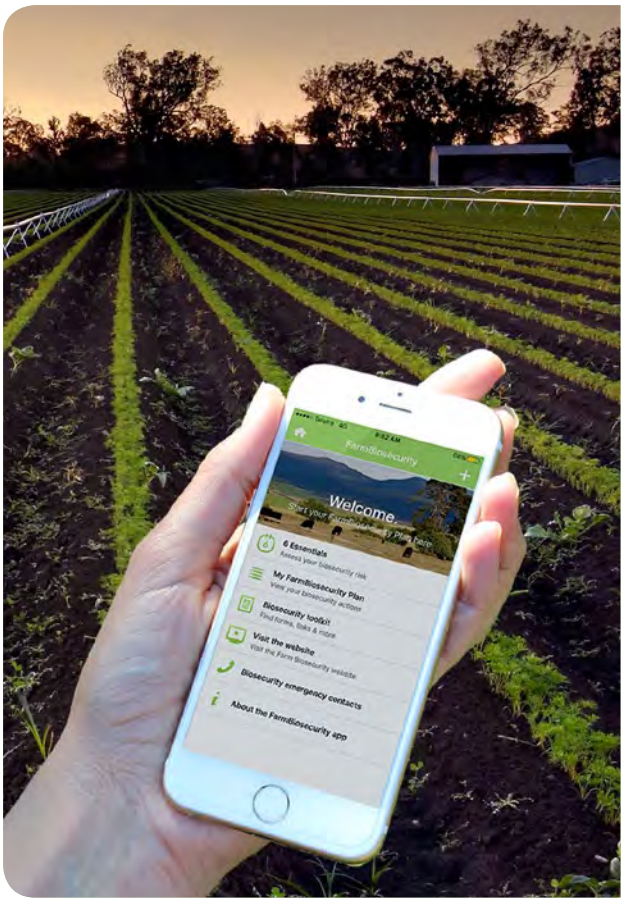
Use the checklist on pages 26 to 33 to identify gaps in your biosecurity preparedness.

Alternatively, use the free FarmBiosecurity app to create your own tailor-made plan. It is based on the six biosecurity essentials used in this manual.

Making a biosecurity plan using the FarmBiosecurity app is easy. Simply select the actions that apply to you from the suggestions, or type in your own actions. Your selections become a to-do list that you can share with others. You can attach photos as reminders or to let others know what needs to be done.

If you have multiple properties or sites, that's not a problem. You can add as many as you like.

The FarmBiosecurity app is available for free from the App Store or Google Play.



Keep records

It is good practice to maintain records as a matter of course. This includes a visitor register to trace people movements.

In the event of a new pest entry that prompts an emergency response, valuable time can be lost trying to determine how far the disease or pest may have spread. Sound record keeping can speed up this process and prevent further spread.

Download, print and use templates for record keeping from **farmbiosecurity.com.au** or **ausveg.com.au**.

It is important to keep records of the sources of all inputs. In addition to fertiliser and seeds, record the movements of contractor machinery as well as where products and other material, such as waste for sheep feed, are shipped to.

Additionally, if you have problems with seed or fertiliser you will be able to use the records to demonstrate the effects on your property to the supplier.

You should be able to 'track back' and 'trace forward' if there is a disease, pest or weed entry on your property.

Exotic pests

Potato growers need to be familiar with the most serious exotic pests and diseases because there is always a chance that a disease could make its way past border controls into Australia.

The most serious exotic threats to the potato industry – known as High Priority Pests – are described here.

Note that this list may change in time, as the High Priority Pest list is reviewed annually by a potato industry biosecurity reference panel. For the most up to date information visit the AUSVEG website.

Information on exotic pests of the potato industry described here has come from a combination of:

- past records
- existing industry protection plans
- industry practice and experience
- published literature
- local and overseas research
- specialist and expert judgement.

Established pests

Established pests of biosecurity significance are pests that are contained within one or more regions, have market access implications, and a significant impact on production, but can be kept off a property through on-farm biosecurity practices.

How pests are assessed

Each pest is assessed on the following criteria and given an overall risk rating. Pests rated a high risk are designated High Priority Pests, which have been agreed by the potato industry and governments so that biosecurity efforts can be coordinated.

For High Priority Pests

Entry potential: There is a risk of introduction through a number of possible pathways including the legal importation of plant material as well as illegal pathways, contamination and through natural means such as wind.

Spread: The natural spread of the pest to most production areas would be largely unhindered or as a contaminant would be difficult to manage hitch-hiking.

Establishment: The pest would be able to survive (establish) in environment conditions that prevail in Australia in the majority of regions where the host is grown.

Economic impact: The pest would severely impact production, including host mortality or significant impacts on either crop quality or storage losses, or severe impacts on market access.

Unless attributed otherwise all information is taken from Version 3 of the Biosecurity Plan for the Potato Industry.

APPENDIX E: SOILS GIPPSLAND AND LATROBE

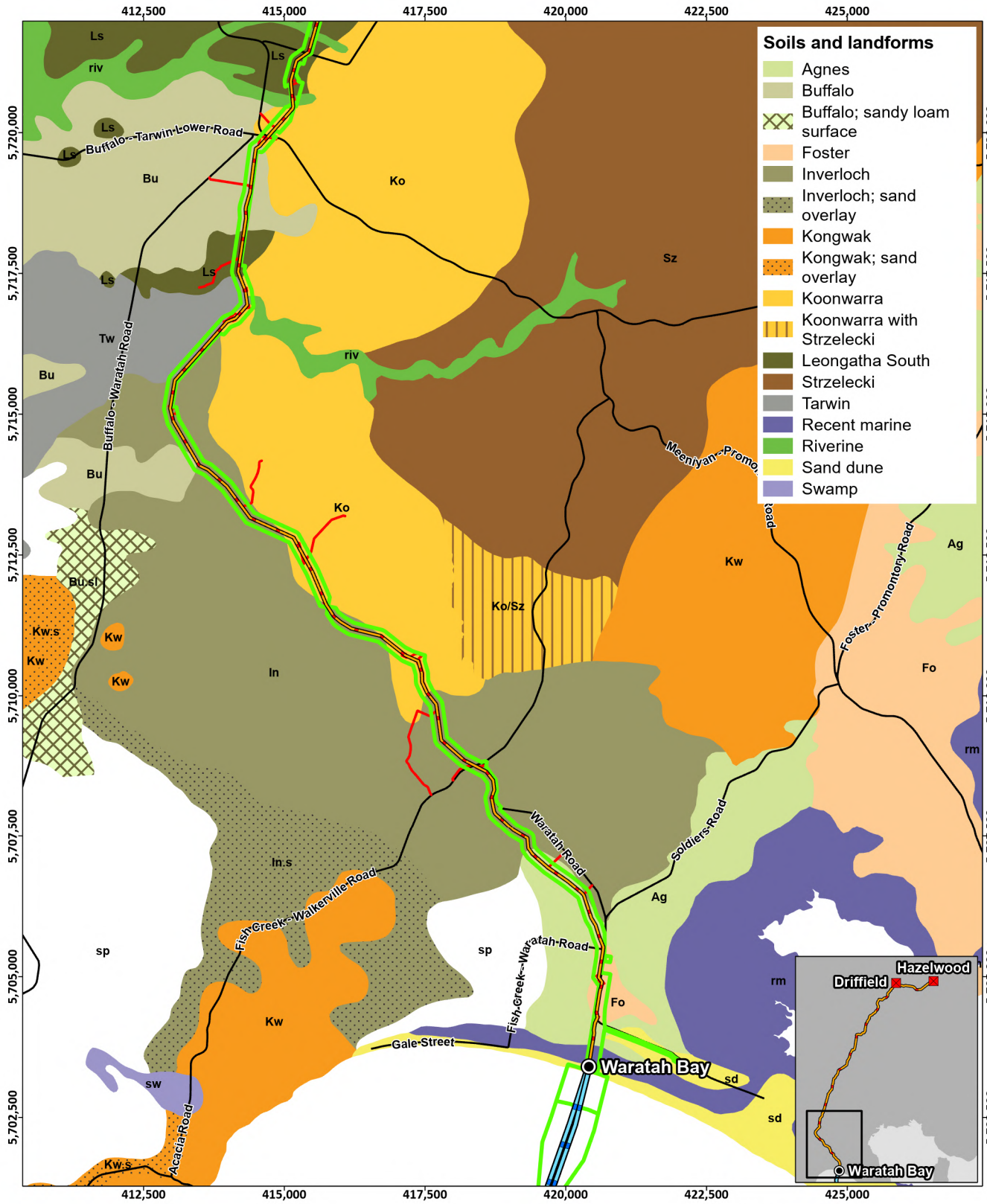


Figure 2.1: Soils and landforms

Legend

- Landfall
- Proposed underground HVDC cable
- Proposed HVDC subsea cable
- Proposed easement
- Area of disturbance
- Marinus Link survey area
- Road

N

Scale: 1:100,000

2 1 0 2 km

Coordinate System: GDA2020 MGA Zone 55
Projection: Transverse Mercator
Datum: GDA2020

Source:
Preferred route and sites of interest from Tetra Tech Coffey.
Soils and landforms of the Gippsland region from DJPR.
Roads and cadastre from VICMAP.

Date: 5/12/2022 12:57 PM
Prepared by: Helen.Unkovich

TETRA TECH COFFEY

MARINUS LINK

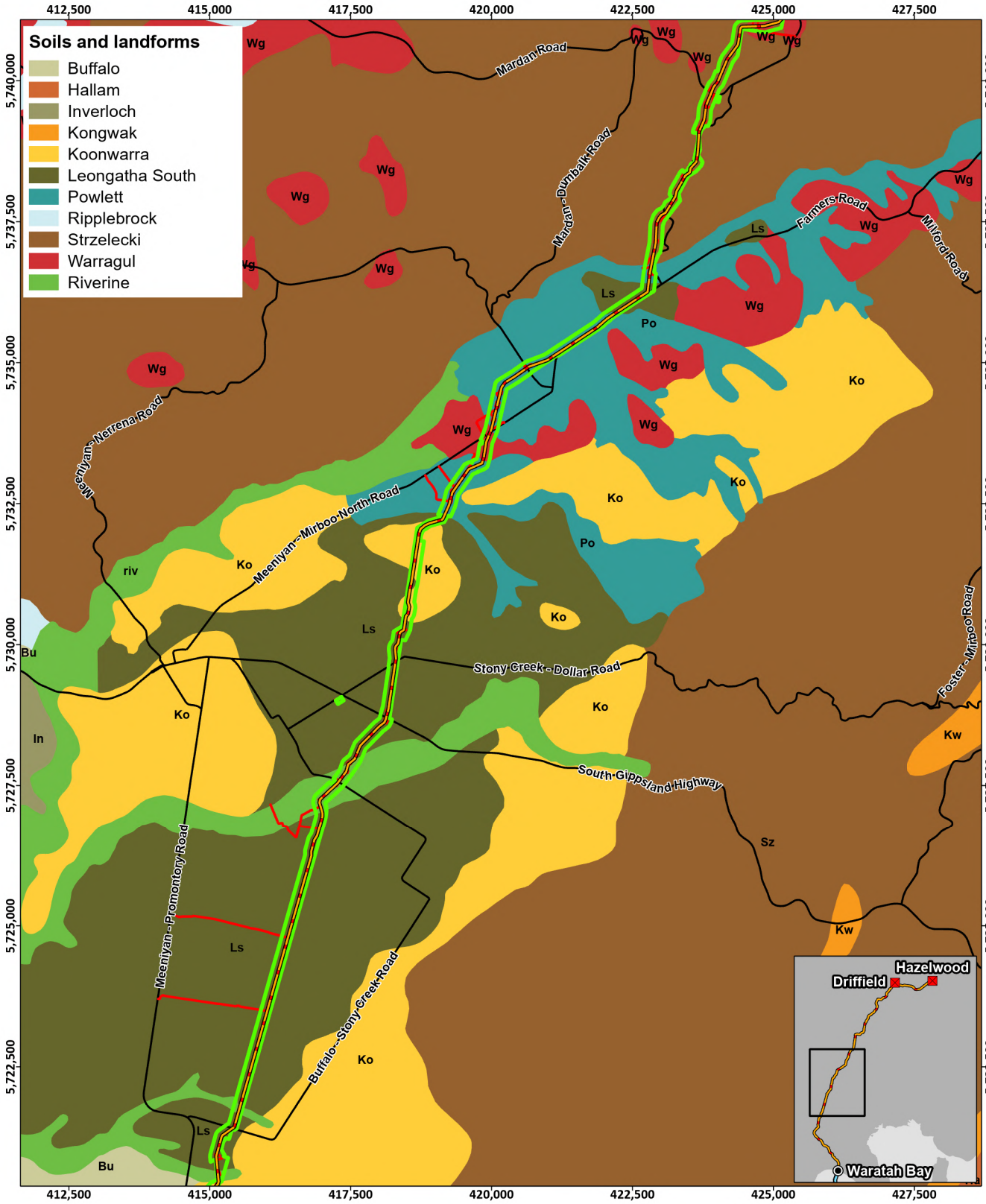


Figure 2.2: Soils and landforms

Legend

- Proposed underground HVDC cable
- Proposed easement
- Area of disturbance
- Marinus Link survey area
- Road

N

Scale: 1:100,000

2 1 0 2 km

Coordinate System: GDA2020 MGA Zone 55
Projection: Transverse Mercator
Datum: GDA2020

Source:
Preferred route and sites of interest from Tetra Tech Coffey.
Soils and landforms of the Gippsland region from DJPR.
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Date: 5/12/2022 12:57 PM
Prepared by: Helen.Unkovich

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MARINUS LINK

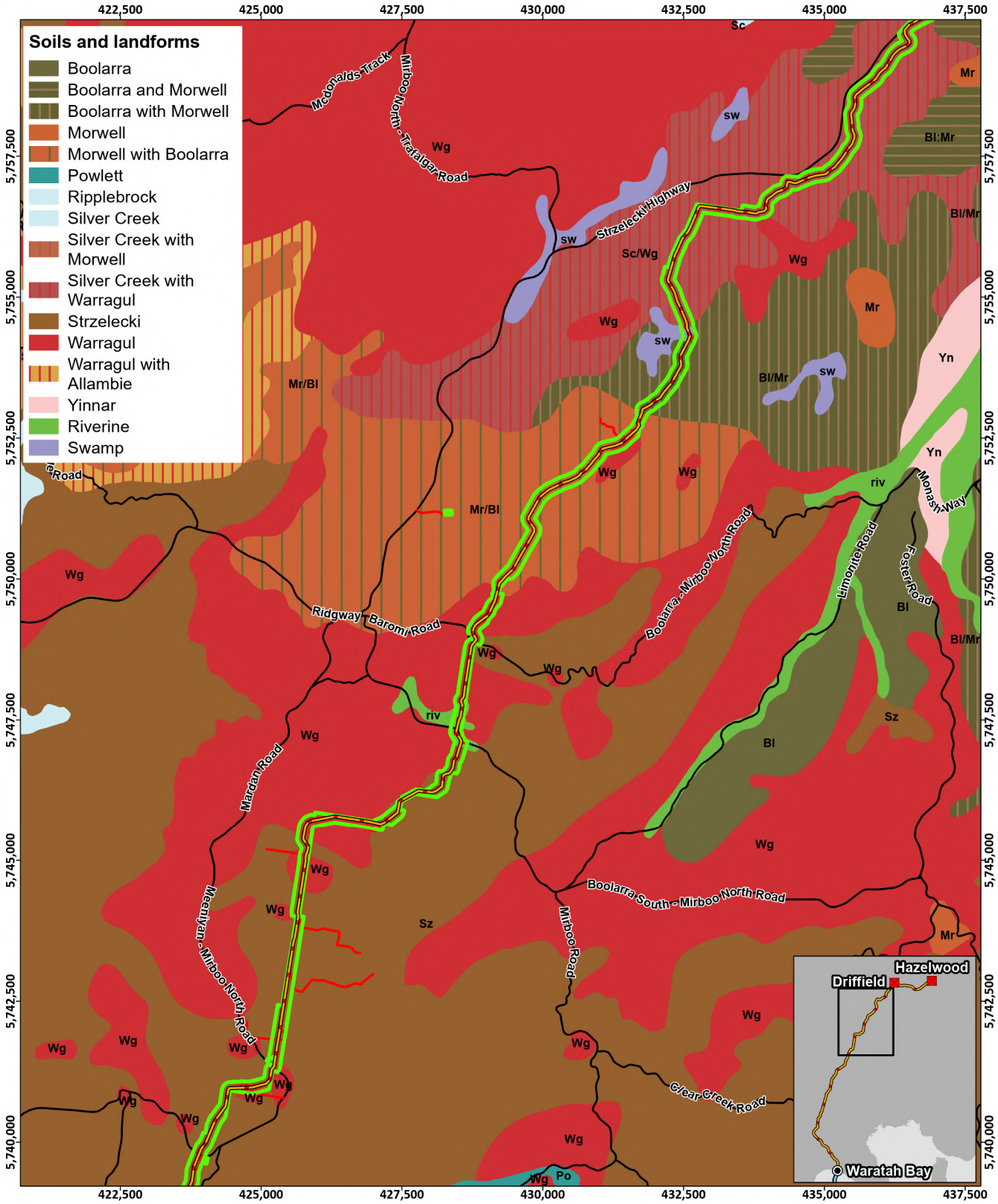

Figure 2.3: Soils and landforms

Legend

- Proposed underground HVDC cable
- Proposed easement
- Area of disturbance
- Marinus Link survey area
- Road

N

Scale: 1:100,000

2 1 0 2 km

Coordinate System: GDA2020 MGA Zone 55
Projection: Transverse Mercator
Datum: GDA2020

Source:
Preferred route and sites of interest from Tetra Tech Coffey.
Soils and landforms of the Gippsland region from DJPR.
Roads and cadastre from VICMAP.

Date: 5/12/2022 12:57 PM
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MARINUS LINK

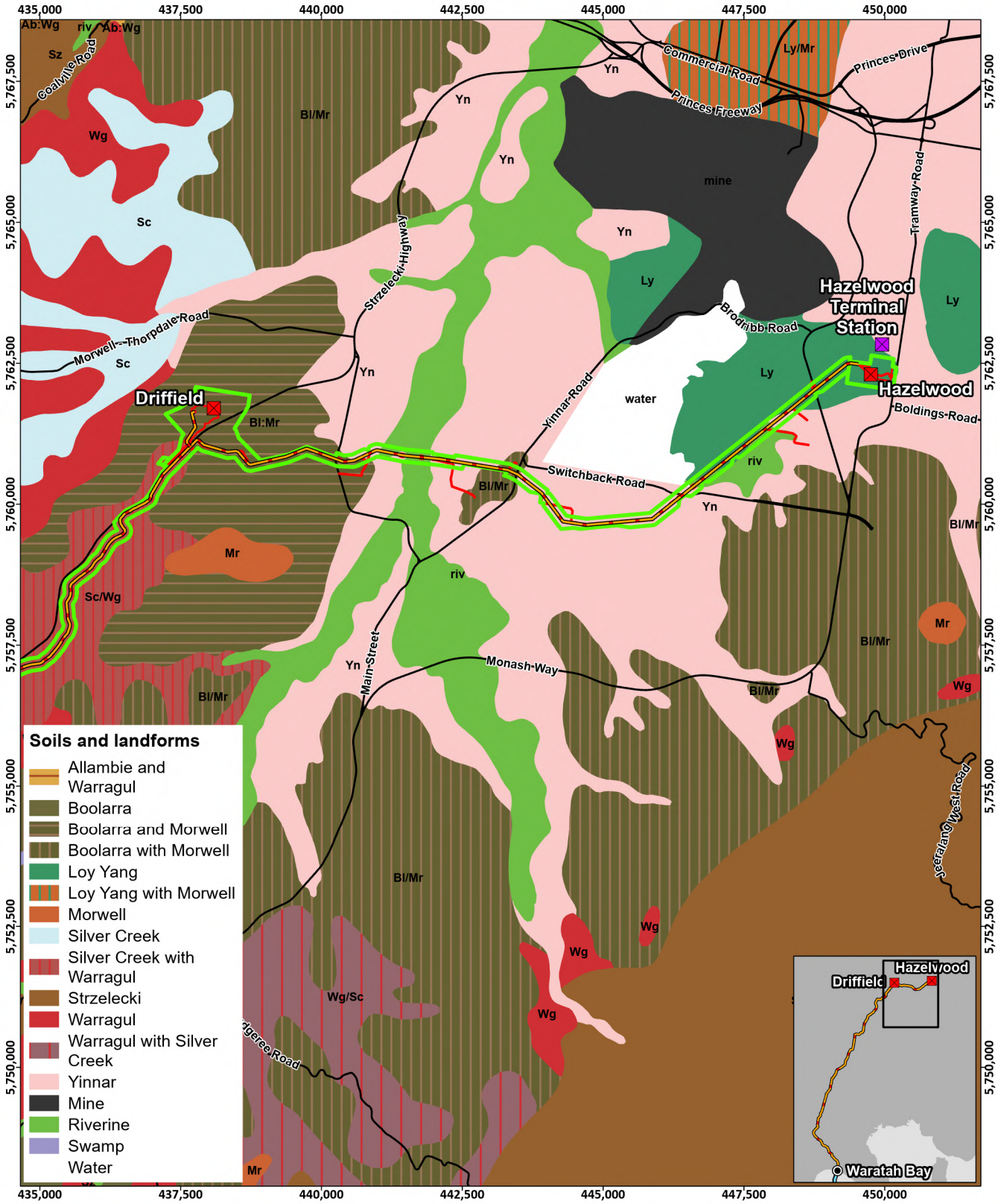

Figure 2.4: Soils and landforms

Legend

- Existing substation
- Potential converter station
- Proposed underground HVDC cable
- Proposed easement
- Area of disturbance
- Marinus Link survey area
- Road

N

Scale: 1:100,000

2 1 0 2 km

Coordinate System: GDA2020 MGA Zone 55
Projection: Transverse Mercator
Datum: GDA2020

Source:
Preferred route and sites of interest from Tetra Tech Coffey.
Soils and landforms of the Gippsland region from DJPR.
Roads and cadastre from VICMAP.

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APPENDIX F: AGRICULTURAL TYPES ALONG THE PROPOSED ALIGNMENT

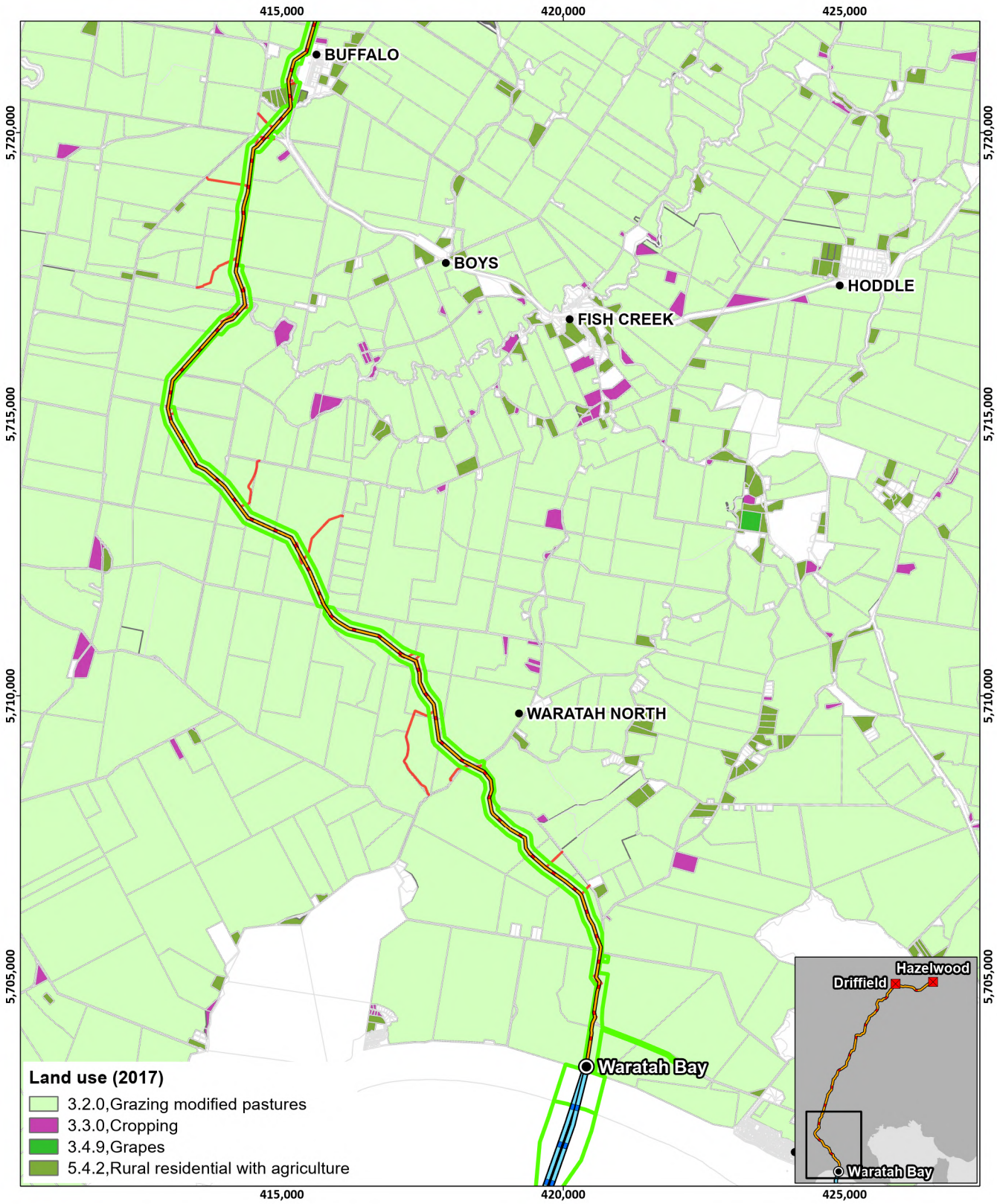

Figure 1.1: Agricultural industry types

Legend

- Landfall
- Proposed underground HVDC cable
- Proposed HVDC subsea cable
- Area of disturbance
- Marinus Link survey area
- Cadastre

N

Scale: 1:100,000

2 1 0 2 km

Coordinate System: GDA2020 MGA Zone 55
Projection: Transverse Mercator
Datum: GDA2020

Source:
Proposed route from Tetra Tech Coffey.
Land use from DJPR (2017).
Roads and cadastre from VICMAP.

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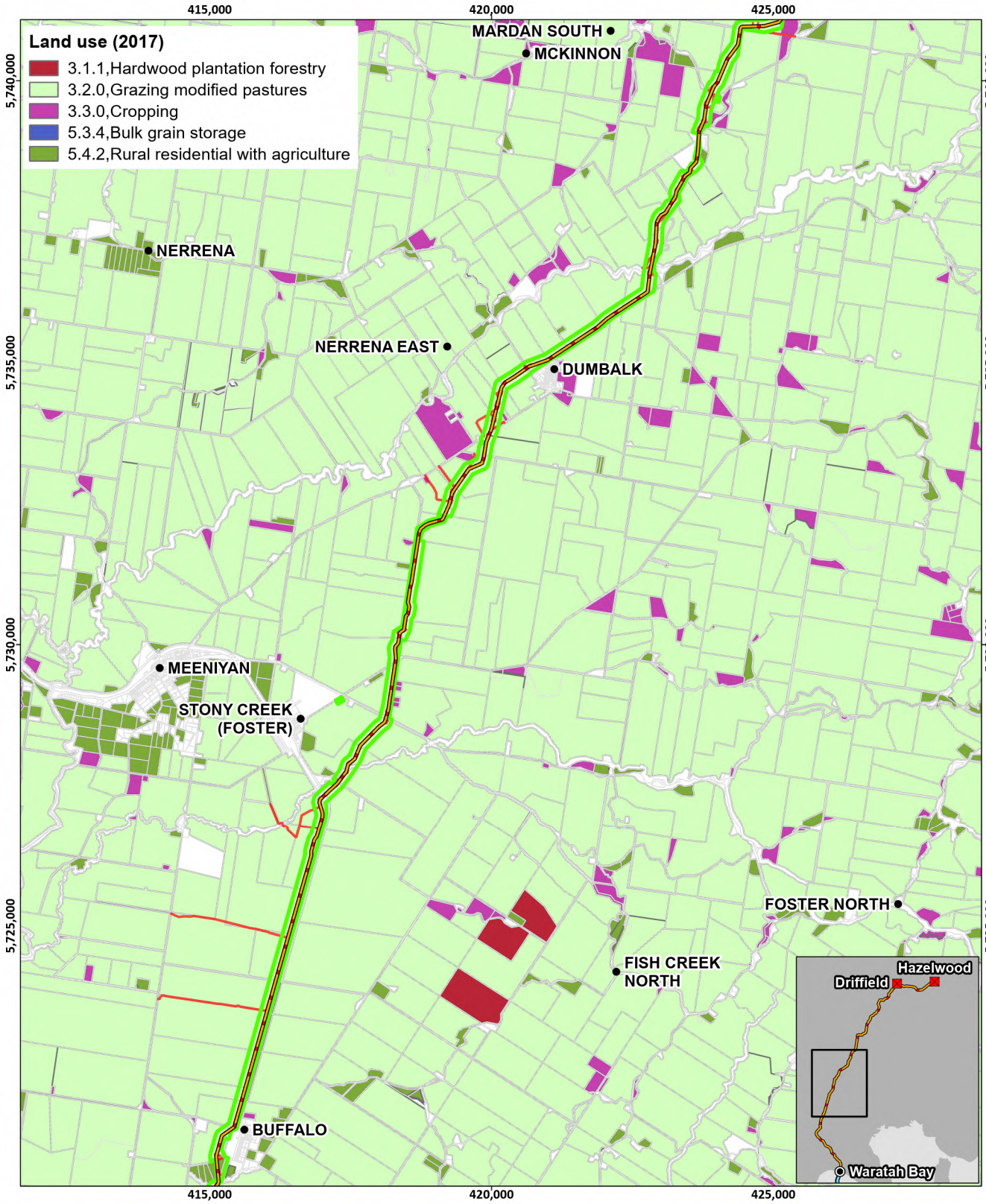

Figure 1.2: Agricultural industry types

Legend

- Proposed underground HVDC cable
- Area of disturbance
- Marinus Link survey area
- Cadastre

N

Scale: 1:100,000

2 1 0 2 km

Coordinate System: GDA2020 MGA Zone 55
Projection: Transverse Mercator
Datum: GDA2020

Source:
Proposed route from Tetra Tech Coffey.
Land use from DJPR (2017).
Roads and cadastre from VICMAP.

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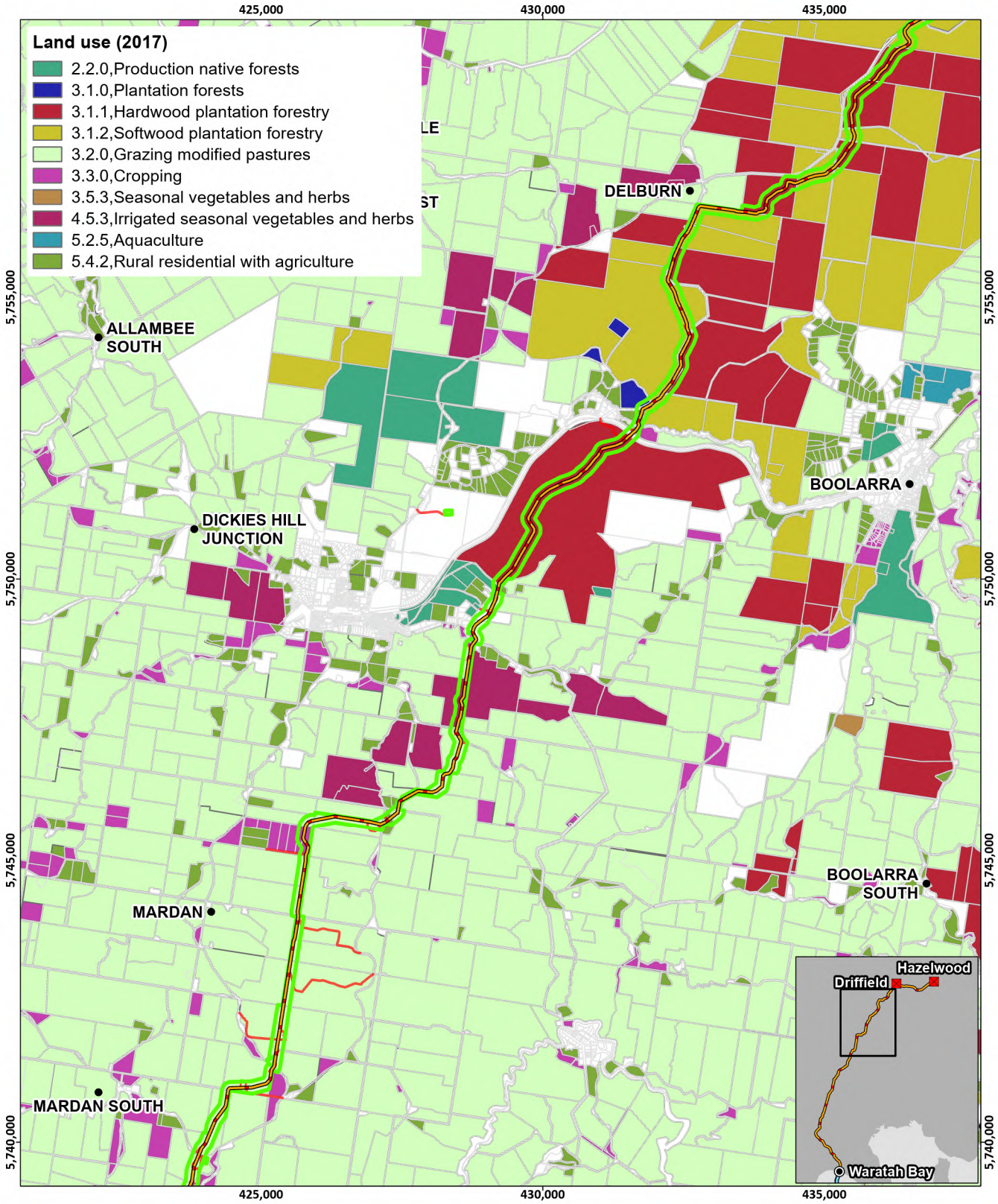

Figure 1.3: Agricultural industry types

Legend

- Proposed underground HVDC cable
- Area of disturbance
- Marinus Link survey area
- Cadastre

N

Scale: 1:100,000

2 1 0 2 km

Coordinate System: GDA2020 MGA Zone 55
Projection: Transverse Mercator
Datum: GDA2020

Source:
Proposed route from Tetra Tech Coffey.
Land use from DJPR (2017).
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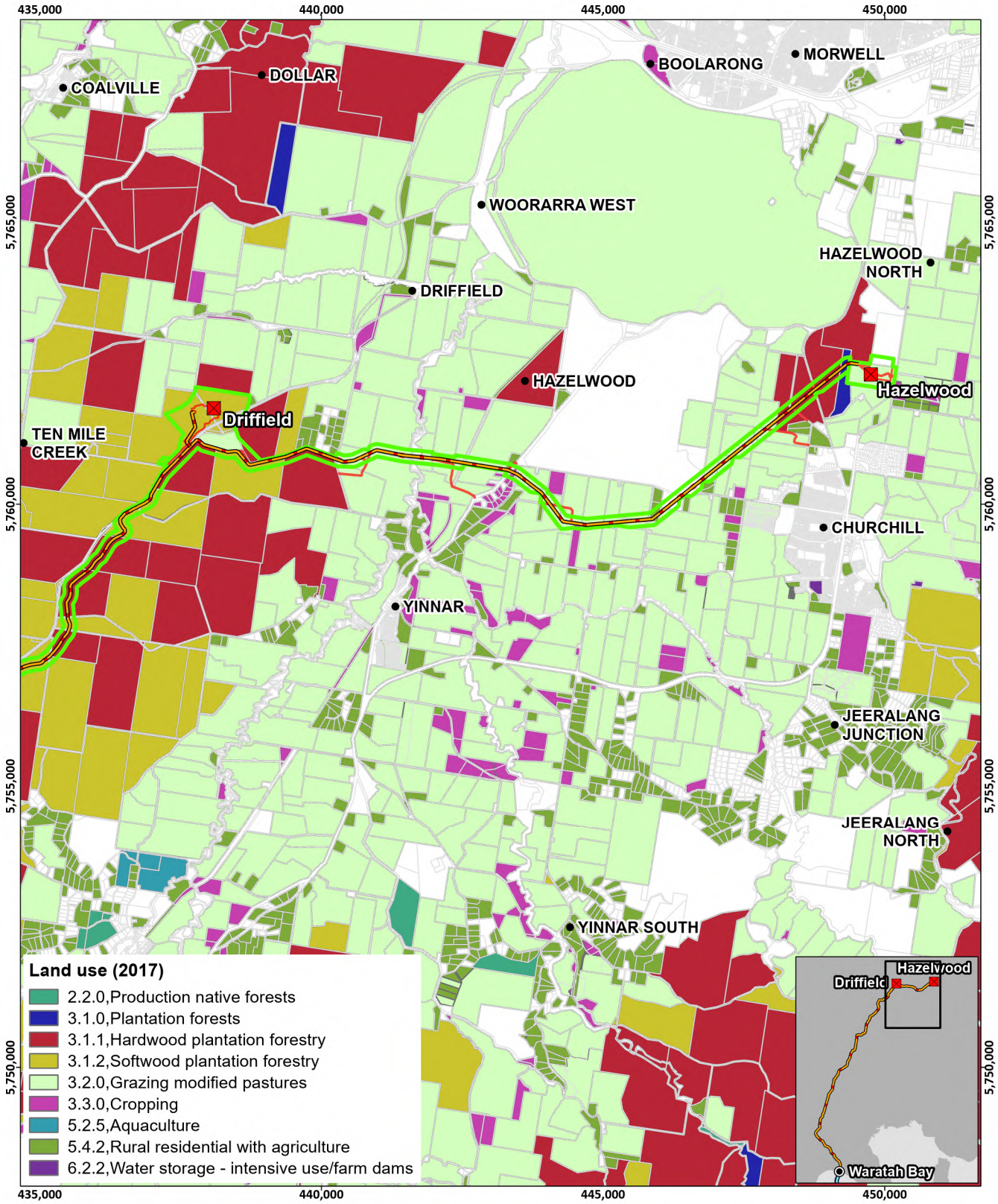

Figure 1.4: Agricultural industry types

Legend

- Potential converter station
- Proposed underground HVDC cable
- Area of disturbance
- Marinus Link survey area
- Cadastre

N

Scale: 1:100,000

2 1 0 2 km

Coordinate System: GDA2020 MGA Zone 55
Projection: Transverse Mercator
Datum: GDA2020

Source:
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Land use from DJPR (2017).
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