CHAPTER 18

Land use and property

ILLABO TO STOCKINBINGAL ENVIRONMENTAL IMPACT STATEMENT

ARTC | INLAND RAIL
An Australian Government Initiative

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18. Land use and property

This chapter provides an assessment of the potential impacts of the Inland Rail—Illabo to Stockinbingal (I2S) (the proposal) on land use and property. It describes the existing environment, assesses the impacts of construction and operation of the proposal, and provides recommended mitigation and management measures.

18.1 Overview

Land use and property information has been considered in design development to inform the proposal location and construction methodology to minimise potential impacts. This has included undertaking consultation with potentially affected landowners and other stakeholders that influenced alignment decisions, and the location of level crossings and underpasses for stock and vehicles on private land to retain connectivity, where practicable.

The proposal site consists primarily of agricultural properties between the residential townships of Illabo and Stockinbingal. Publicly available land use mapping (Office of Environment and Heritage (OEH), 2017), in conjunction with landowner consultation and investigations, indicates land use within the study area is dominated by cropping and grazing modified pastures.

During construction, the proposal would require both permanent and temporary land requirements. The total land (permanent and temporary) required for construction of the proposal is 612 hectares (ha) with approximately 458 ha comprising the permanent land requirement and around 154 ha comprising the temporary land requirements for construction.

The removal of about 458 ha of land from agricultural production would result in highly localised agricultural land-use impacts. This scale of impact is not considered significant at a regional scale as the area temporarily affected is relatively small in the context of the regional agricultural industry.

Construction works and associated land requirements would have a range of potential impacts, including:

- impacts on agricultural land and land capability, depending on the different stages of construction
- farm severance where the new rail corridor or the realignment of Burley Griffin Way results in part of an overall farm being physically separated from the remainder of the farm (either temporarily or permanently). Subsequent realignment of paddocks could also affect the sustainability, productivity and profitability of individual paddocks that have previously been set up under specific farming systems
- temporary disruption to land use and property access along the construction corridor for construction areas, compounds and haulage routes
- additional risks for the transport of livestock along the livestock highway as a result of construction traffic volumes on these roads and associated intersections
- the permanent possession of land during construction would contribute to the permanent footprint of the new rail corridor.

Proposed measures would seek to address these impacts, where reasonable and practicable, as follows:

- Design and construction planning would continue to be refined to minimise potential impacts on land uses and properties, including measures to manage severance.
- Individual property agreements would be developed in consultation with landowners/occupants, with respect to the management of construction on or immediately adjacent to private properties.
- Access to individual residences, services and businesses, and for livestock across the rail corridor would be maintained during construction.

During operation, the proposal would require the permanent acquisition of private land. This is approximately 476.4 hectares acquired from 26 private landholders. Total permanent acquisition of public land (Crown land, Crown roads, Council roads and Transport for NSW roads) is approximately 12.6 ha. The total land requirement for permanent acquisition (489 hectares) is greater than the permanent land requirement (458 hectares) for the proposal as the land acquired involves whole lots that may be only partially required.

Operation would have a range of potential impacts including:

- Direct impacts on land use from the permanent land requirements and the presence of operational rail and road infrastructure within the operational footprint.
- Ongoing impacts on farm infrastructure and farming operations, due to fragmentation or property severance.

- Permanent restriction of movement across the rail corridor to designated locations, which may result in delays to landowners.

Proposed measures would seek to address these impacts as follows:

- design development would include ongoing consultation with landowners to identify opportunities to minimise operational impacts on property operations and farm infrastructure, including on access to properties
- interface agreements would be required for all private crossings on Inland Rail and would be put in place to assist in the safe movement of stock and non-standard machinery across the rail corridor.

Mitigation measures to manage the potential for traffic and access, air quality, noise, social and economic, waste, and health and safety impacts would also assist in minimising the potential for land use and property impacts.

18.2 Approach

A summary of the approach to the assessment is provided in this section, including the legislation, guidelines and/or policies driving the approach and the methodology used to undertake the assessments.

18.2.1 Legislative and policy context of the assessments

18.2.1.1 Relevant legislation, policies and guidelines

The land use and property assessments were undertaken in accordance with the Secretary's Environmental Assessment Requirements (SEARs) and with reference to the requirements of relevant legislation, policies and/or assessment guidelines, including:

- *Biosecurity Act 2015* (NSW) (Biosecurity Act)
- *Biodiversity Conservation Act* (NSW) (BC Act)
- the local environmental plans (LEPs) that apply to the study area—Cootamundra and Junee LEP
- *Guideline for Agricultural Impact Statements at the Exploration Stage* (NSW Government, 2015)
- *Agricultural impact statement technical notes* (NSW Department of Primary Industries (DPI), 2013b)
- *NSW Aboriginal Participation in Construction Policy 2018* (NSW Procurement, 2018)
- *Infrastructure proposals on rural land*: Primefact 1063, *second edition* (DPI, 2013b)
- *Land use conflict risk assessment guide* (DPI, 2011)
- *NSW Invasive Species Plan* 2018-2021 (DPI, 2018)
- *Riverina Regional Strategic Weed Management Plan* 2017-2022 (NSW LLS, 2017)
- *Riverina Regional Strategic Pest Animal Management Plan* 2018-2023 (NSW LLS, 2018)
- *Riverina Murray Regional Plan 2036* (NSW Department of Planning and Environment (DPE), 2017a)
- *New England North West Regional Plan 2036* (NSW DPE, 2017b)
- *Land Acquisition (Just Terms Compensation) Act 1991* (NSW) (LA Act).

18.2.1.2 Secretary's Environmental Assessment Requirements

Relevant Secretary's Environmental Assessment Requirements (SEARs) related to land use and property are provided in Appendix A. Land use and property issues identified in the SEARs also include social and economic requirements that are addressed separately in Chapter 17: Social and economic, Technical Paper 11: Social Impact Assessment and Technical Paper 12: Economic Impact Assessment.

18.2.2 Methodology

18.2.2.1 Study area

The study area encompasses the two LGAs traversed by the proposal—Cootamundra and Junee.

18.2.2.2 Key tasks—agriculture and land use assessment

The assessment involved:

- reviewing the regulatory framework for land use and management, including relevant state, regional and local planning legislation, environmental planning instruments, policies, strategies and guidelines
- reviewing, identifying and mapping existing land uses within the proposal site and immediate surrounds (study area), based on a desktop review of geographical information system (GIS) spatial data and aerial photography, including:
  - land uses based on mapping from the (then) Department of Planning, Industry and Environment
  - land use zoning provided by the zoning maps that form part of the relevant LEPs for Cootamundra and Junee
  - strategic agricultural land as identified under the NSW Government's Strategic Regional Land Use Policy (DPE, 2013) and biophysical strategic agricultural land mapping
  - significant properties and/or landholdings
  - agricultural uses, including any areas of regionally significant farmland; areas used for cropping, grazing and horticulture; travelling stock reserves (TSRs); and agricultural infrastructure
  - Crown land
  - conservation and forest reserves, including national parks, conservation areas and state forests
  - exploration and mining leases and licenses
- collection and desktop review of relevant publicly available information, including:
  - topography and climate data
  - land and soil data, including soil type, fertility and land capability mapping
  - other mapping relevant to land capability, including agricultural land classification, biophysical strategic agricultural land and important agricultural land
  - agricultural productivity, including statistics relevant to employment and agricultural businesses, crop and livestock, and overall value of agricultural production
- field assessments to verify the identified land uses
- assessing the potential for impacts on agricultural land uses during construction and operation, in accordance with the *Agricultural impact statement technical notes* (DPI, 2013b)
- assessing the potential for non-agricultural land use impacts, including impacts on mining
- undertaking a land use conflict risk assessment in accordance with the *Land Use Conflict Risk Assessment Guide* (DPI, 2011)
- consultation with relevant state agencies including Riverina Local Land Services (LLS) and DPI
- providing measures to mitigate and manage the impacts identified.

For the purposes of the agricultural impact assessment, farms that span across multiple allotments were considered together as a single unit to understand how the proposal will impact the connectivity and working of the farm.

18.2.2.3 Key tasks—property impact assessment

The assessment of potential property impacts was informed by the:

- review of cadastral and property ownership information
- identification of properties located within the proposal site
- review of ARTC-led consultation with landholders to understand property usage and operation
- consideration of the potential for impacts on property during construction and operation
- providing measures to mitigate and manage the impacts identified.

ARTC have engaged in extensive consultation with landowners impacted by the proposal since 2018 and have conducted property inspections to understand the potential impacts to each farm along the proposal site. This consultation is ongoing and will continue throughout each phase of the design and construction.

To avoid or minimise the identified potential impacts, mitigation and management measures were identified.

18.2.2.4 Key tasks—biosecurity impact assessment

The assessment of the potential biosecurity risks was based on:

- desktop review of publicly available information relevant to biosecurity risks, including the *Riverina Regional Strategic Weed Management Plan 2017-2022* (NSW LLS, 2017) and the *Riverina Regional Strategic Pest Animal Management Plan 2018-2023* (NSW LLS, 2018)
- review of ARTC-led consultation with landowners and other stakeholders
- consideration of the potential for impacts on property during construction and operation
- results of field surveys completed as part of Technical Paper 1: Biodiversity Development Assessment Report (Technical Paper 1).

18.2.3 Risks identified

The environmental risk assessment for the proposal (refer to Appendix G: Environmental risk assessment) included consideration of potential land use and biosecurity risks associated with the proposal. Land use and property risks with an overall assessed rating of medium or above, as identified by the environmental risk assessment (pre-mitigated) included:

- effects on access to and within properties as a result of changes to private access roads and internal access arrangements
- indirect impacts on agricultural land use/production and livestock from construction activities, including impacts from changes to access, noise and air pollution
- temporary changes to land use as a result of the proposal's land requirements during construction—temporary leasing of additional areas outside the operational footprint to facilitate construction negatively affects the availability of land for other uses
- the movement of construction machinery and materials introduces biosecurity risks, including the spread of weeds
- impacts on agricultural land use from construction activities including impacts from reduced access, noise and air pollution
- impacts on land use as a result of property acquisition
- severance of properties resulting in smaller lot sizes that may affect existing use and/or development potential
- severance of properties resulting in changes to the arrangement of properties that may affect agricultural use and productive capacity
- land permanently required for the proposal affects the productive capacity of individual properties
- land permanently required for the proposal results in a change to land use in the study area, negatively affecting the availability of land for non-transport related uses (including changes to the availability of agricultural zoned land)
- impacts due to changes in infrastructure, including increased waiting times at level crossings and safe holding distances for large vehicles affecting agricultural land access.

The land use and property assessments considered the potential risks identified by the environmental risk assessment, in addition to potential risks and impacts identified by the scoping report (refer to section 9.1), the SEARs and relevant guidelines and policies (as appropriate).

18.2.3.1 How potential impacts have been and would be avoided

Land use and property information has been considered in the proposal design process to inform the proposal location and construction methodology to minimise potential impacts. This has included undertaking consultation with potentially affected landholders and other stakeholders that influenced alignment decisions, where practicably possible, and the location of level crossings and underpasses for stock and vehicles on private land to retain connectivity where practicably possible.

18.3 Existing environment

18.3.1 General land use description

The study area generally consists of agricultural properties between the residential townships of Illabo and Stockinbingal. An overview of general land uses in the study area is provided in Figure 18-1, showing land use zoning from the relevant LEP, and Figure 18-2, showing rural land uses within and surrounding the proposal site.

Publicly available land use mapping (OEH, 2017) indicates land use within the study area is dominated by cropping and grazing modified pastures (refer to Figure 18-2). Cropping land is generally used for both cropping and grazing of improved (modified) pastures in rotation. At a single point in time, the proportion of land being cropped is lower than indicated by the land use classification (OEH, 2017).

Grazing of native vegetation (pastures) and managed resource protection (mostly tree lots and plantings of native vegetation) are also relatively common, especially in the central portion of the study area where land quality is lower (see section 18.3.3.1). Significant areas are mapped as residential and farm infrastructure; however, inspections indicate that the actual land occupied by residential and farm infrastructure is much less than is indicated by the land use mapping.

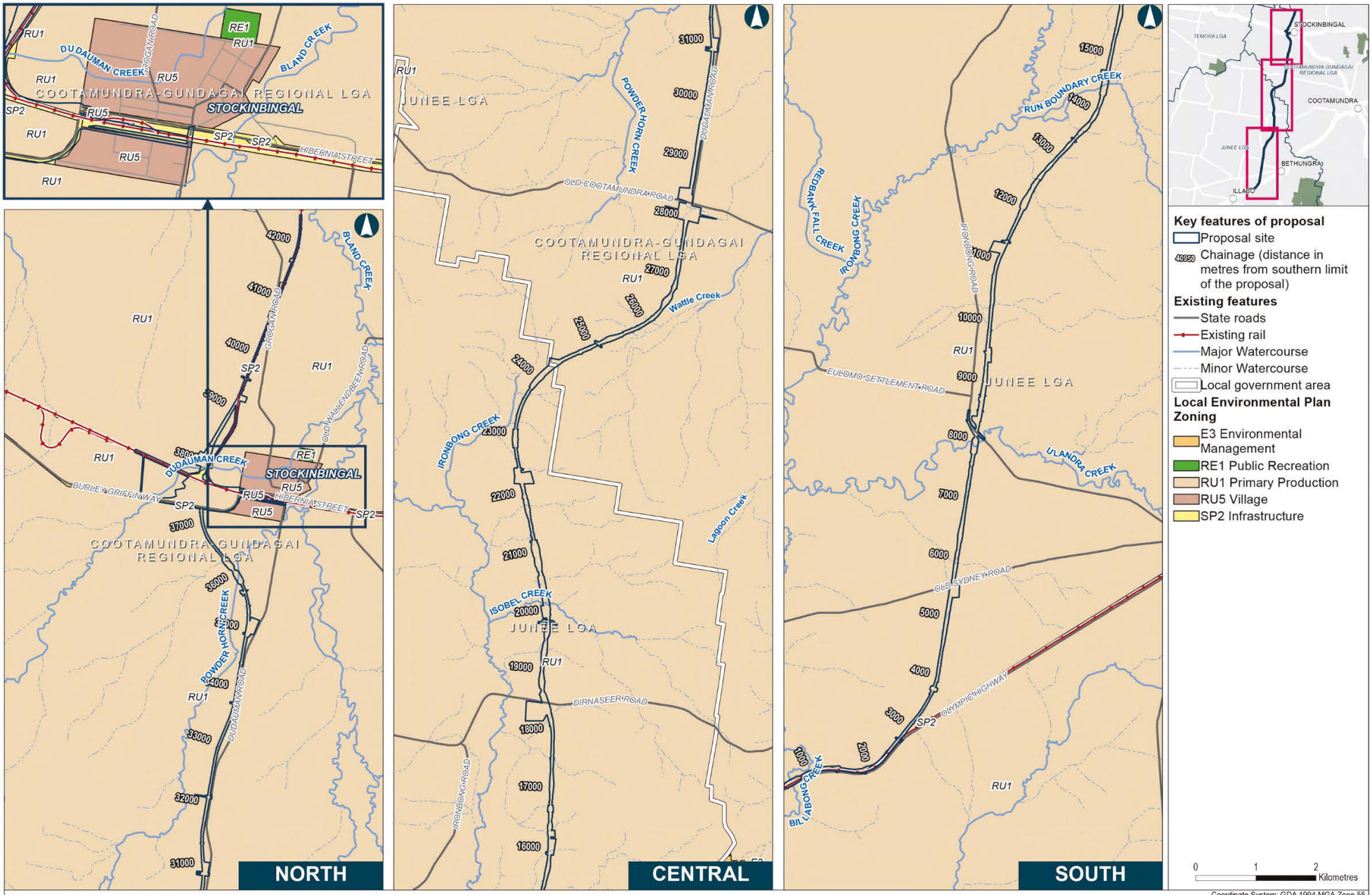
18.3.2 Land uses within the proposal site

The majority of the proposal site is zoned Primary Production (RU1), with a small amount of Infrastructure (SP2) zone along railways and roads (see Figure 18-1). Land to the east of the proposal, associated with the Bethungra Range, is zoned Environmental Management (E3).

Land within the Stockinbingal township is predominantly zoned Village (RU5) with a small area of zoned Public Recreation (RE1) in the north-east.

Land within the Illabo township is predominantly zoned Village (RU5), with some areas of Public Recreation (RE1) and Large Lot Residential (R5) to the east.

The proposal site includes some additional areas outside the rail corridor (e.g. public land including road reserves) that are primarily required for construction activities and these are detailed in Appendix D.



18.1 Zones in the Study Area

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Date: 8/10/2021

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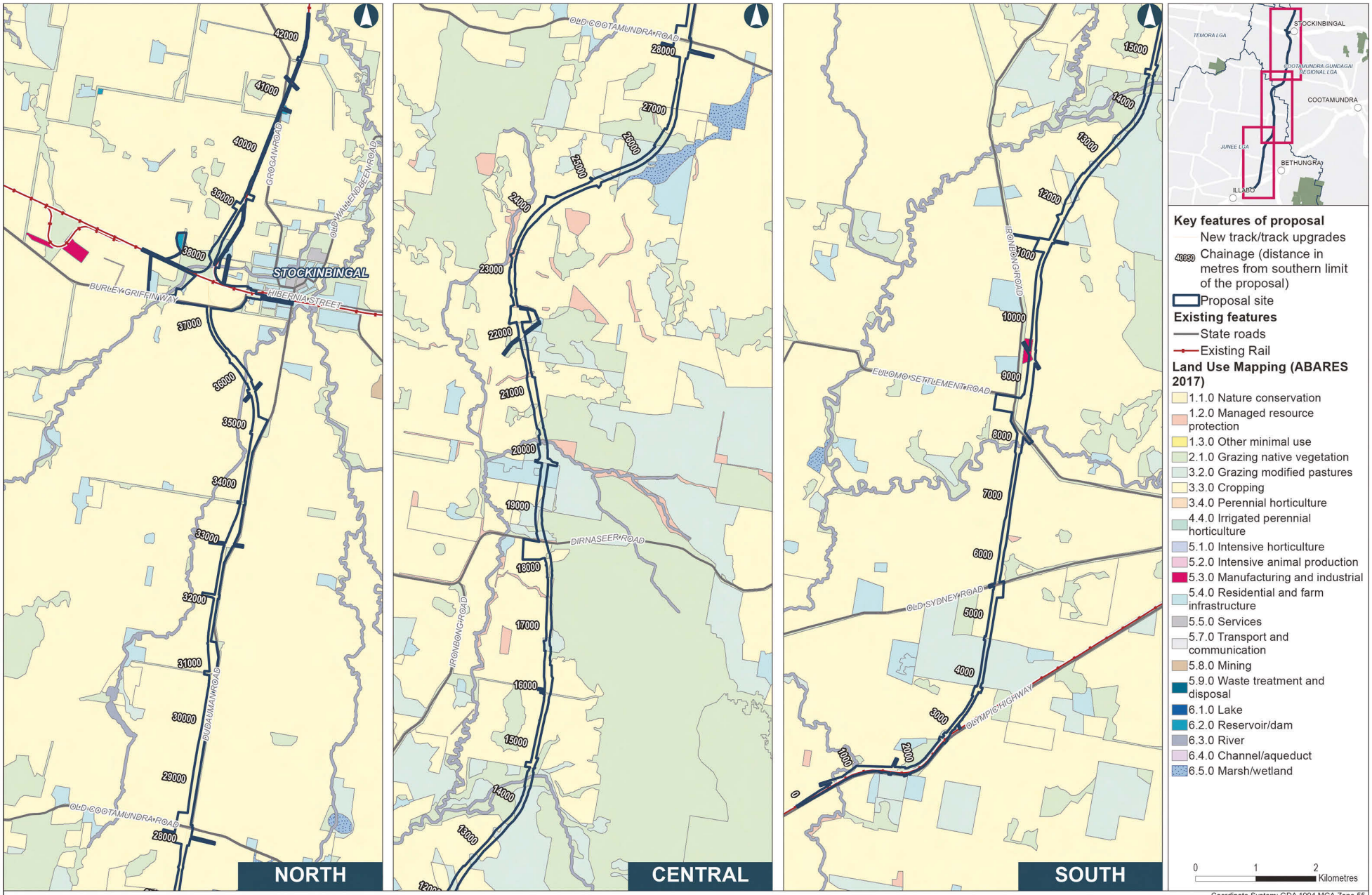

18.2 Rural land use mapping

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Paper size: A3 Scale: 1:60,000
Date: 8/10/2021

Data Sources: ####

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18.3.3 Agriculture uses and activities

18.3.3.1 Agricultural land capability and productivity

Land in NSW is commonly classified according to the capability of land to remain stable under particular land uses. Land capability systems classify land in terms of its inherent physical characteristics or constraints and considers the optimum use of land rather than the maximum use. In general, the classification will not change over time.

Land and soil capability (OEH, 2012) are categories of land based on an assessment of the biophysical characteristics of the land, the extent to which this will limit a particular type of land use. Class 1 represents land capable of sustaining most intensive agricultural uses, often associated with regular soil cultivation, while Class 8 land can only sustain very low intensity agricultural uses. Careful management of each class is needed to avoid land and environmental degradation.

The northern and southern portions of the study area consist primarily of Class 3 (high capability) land with smaller areas of Class 4 (moderate capability) land (see Figure 18-3). The central section of the study area has a mixture of Class 3, 4 and 6 (low capability) land. These categories are defined as:

- Class 3—'*high capability land: Land has moderate limitations and is capable of sustaining high-impact land uses, such as cropping with cultivation, using more intensive, readily available and widely accepted management practices'* (OEH, 2012)
- Class 4—*'moderate capability land: Land has moderate to high limitations for high-impact land uses. Will restrict land management options for regular high-impact land uses such as cropping, high-intensity grazing and horticulture'* (OEH, 2012)
- Class 6—*'low capability land: Land has very high limitations for high-impact land uses. Land use restricted to low-impact land uses such as grazing, forestry and nature conservation'* (OEH, 2012).

General environmental conditions including the location, topography, soils, hydrology and climate are important factors relevant to agricultural production and are discussed further in the following EIS chapters:

- Chapter 12: Hydrology and flooding
- Chapter 13: Water quality
- Chapter 20: Soils and contamination
- Chapter 22: Climate change risk.

18.3.3.2 Biophysical Strategic Agricultural Land

Biophysical Strategic Agricultural Land (BSAL) is land with high-quality soil and water resources capable of sustaining high levels of productivity. These lands have the best quality intrinsic landforms, soil and water resources, which are naturally capable of sustaining high levels of productivity and require minimal management practices to maintain this high quality (DPE, 2013).

Mapping of BSAL was undertaken by the (then) NSW Department of Planning and Infrastructure. This mapping indicates that there is no BSAL on the permanent footprint or surrounding properties.

This classification accords with property inspections and review of other data. While the study area consists mainly of arable land with good productivity, it does not include substantial land areas with the highest quality soil and water resources.

18.3.3.3 Water resources

In addition to land capability considerations, agricultural production is also influenced by surface and groundwater resources. For the rural land surrounding the proposal, surface water supply predominantly comes from rainfall collected via rainwater tanks, farm dams and from the reticulated water network operated by Goldenfields Water. Goldenfields Water operate a reticulated network across the study area that services many of the farms with both stock and domestic supply.

Many of the watercourse catchments that intersect the proposal site are small and do not have defined channels and therefore their geomorphologic conditions change with every rainfall event. These undefined watercourse catchments are predominantly cleared of remnant vegetation and farm dams have been constructed to capture overland flows for storage for agricultural purposes.

Groundwater (including bores) and surface water resources are also used for stock and domestic purposes. Surface water dams for livestock drinking water are an important resource for the livestock industries.

For further detail on water resources refer to Chapter 12: Hydrology and flooding.

18.3.3.4 Agricultural production

The typical farm in the study area comprises cleared land that is used for agricultural production. It is common for farms in the area to comprise of mixed farming operations, both livestock and cropping enterprises.

The gross value of agricultural production in the Cootamundra and Junee LGAs in 2015–16 averaged $586 per hectare (ha) over the total area of agricultural holdings (ABS, 2017a). The value of agricultural production is greatly influenced by seasonal and market conditions and can fluctuate widely from year to year.

As shown in Table 18-1, the average crop yields within Cootamundra and Junee LGAs are higher than the NSW average. It is expected that the LGA average yields would be reflected in similar average crop yields within the study area, with wheat the highest produced crop.

TABLE 18-1: CROP YIELDS IN THE STUDY AREA

Crop/yield (tonne/ha)	Cootamundra and Junee	NSW	% compared to NSW
Wheat	3.65	2.58	141%
Other cereals	2.92	2.29	127%
Canola	1.96	1.66	118%
Other non-cereals	2.05	1.63	126%

Source: ABS 2012, 2017a

Sheep and cattle account for almost all of the grazing livestock within the study area. As shown in Table 18-2, the average stocking rate across Cootamundra and Junee LGAs are higher than the NSW average stocking rate.

TABLE 18-2: STOCK YIELDS IN THE STUDY AREA

LGA	Stock/yield (tonne/ha)	NSW	% compared to NSW
Cootamundra	5.2	1.78	292%
Junee	6.4	1.78	360%

Source: ABS 2012, 2017a

Other land uses include agricultural infrastructure (including sheds, stock yards, roads and livestock water), farm residential areas, public roads, native vegetation and plantations.

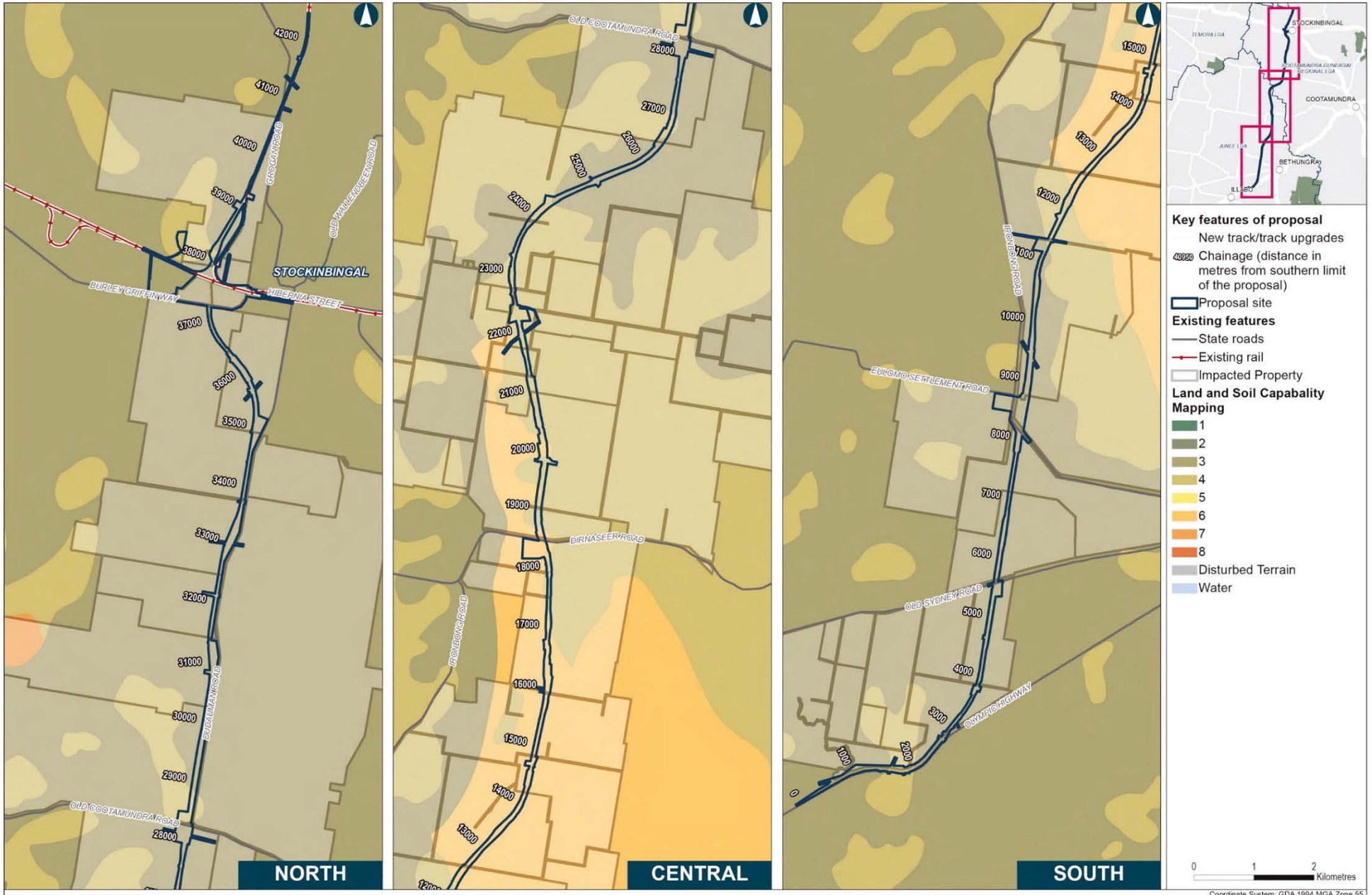
Information presented is based on census data collected by the ABS. For further economic information refer to Chapter 17: Social and economic.

18.3.3.5 Agricultural access and movements

Agricultural properties within the study area are currently serviced by public roads and private internal tracks. Properties generally have multiple points through which movement may occur across a farm and onto public roads. Figure 18-4 shows a snapshot of the indicative farm make up established through community consultation at the time of route optimisation.

Where practicably possible, level crossings and underpasses will be incorporated to maintain connectivity between farm areas that are impacted by the proposal site. Figure 18-4 shows a snapshot of the indicative farm make up established through community consultation at the time of route optimisation, through different colours used for each indicative farm area. Figure 18-4 also shows the current public access and the proposed level crossings and underpasses to retain connectivity of farm infrastructure that will be severed by the rail corridor.

No TSRs are traversed by the proposal site, as discussed in section 18.3.5 below.



18.3 Land and soil capability

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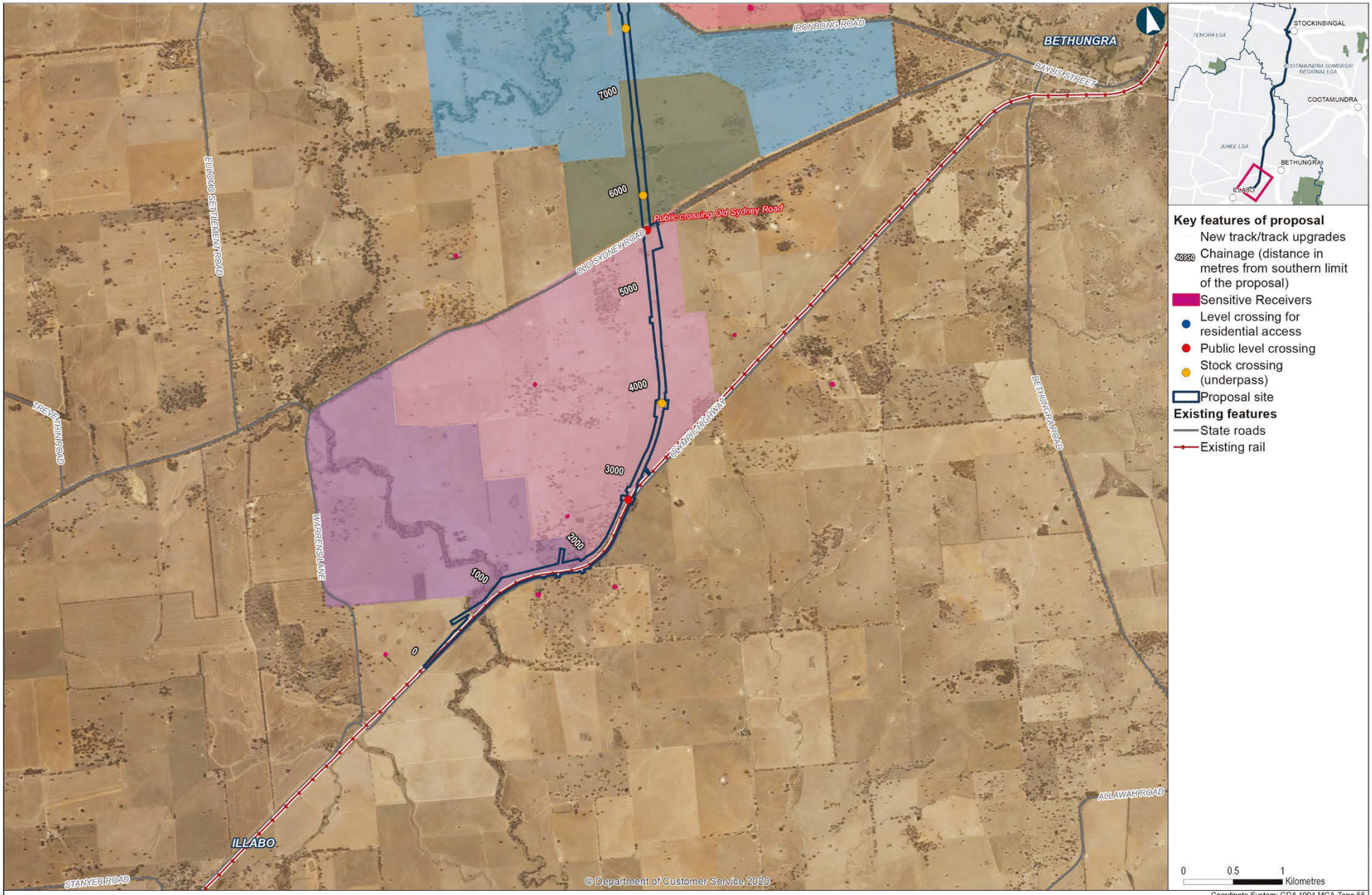

18.4 Farm accessibility measures provided by the Proposal

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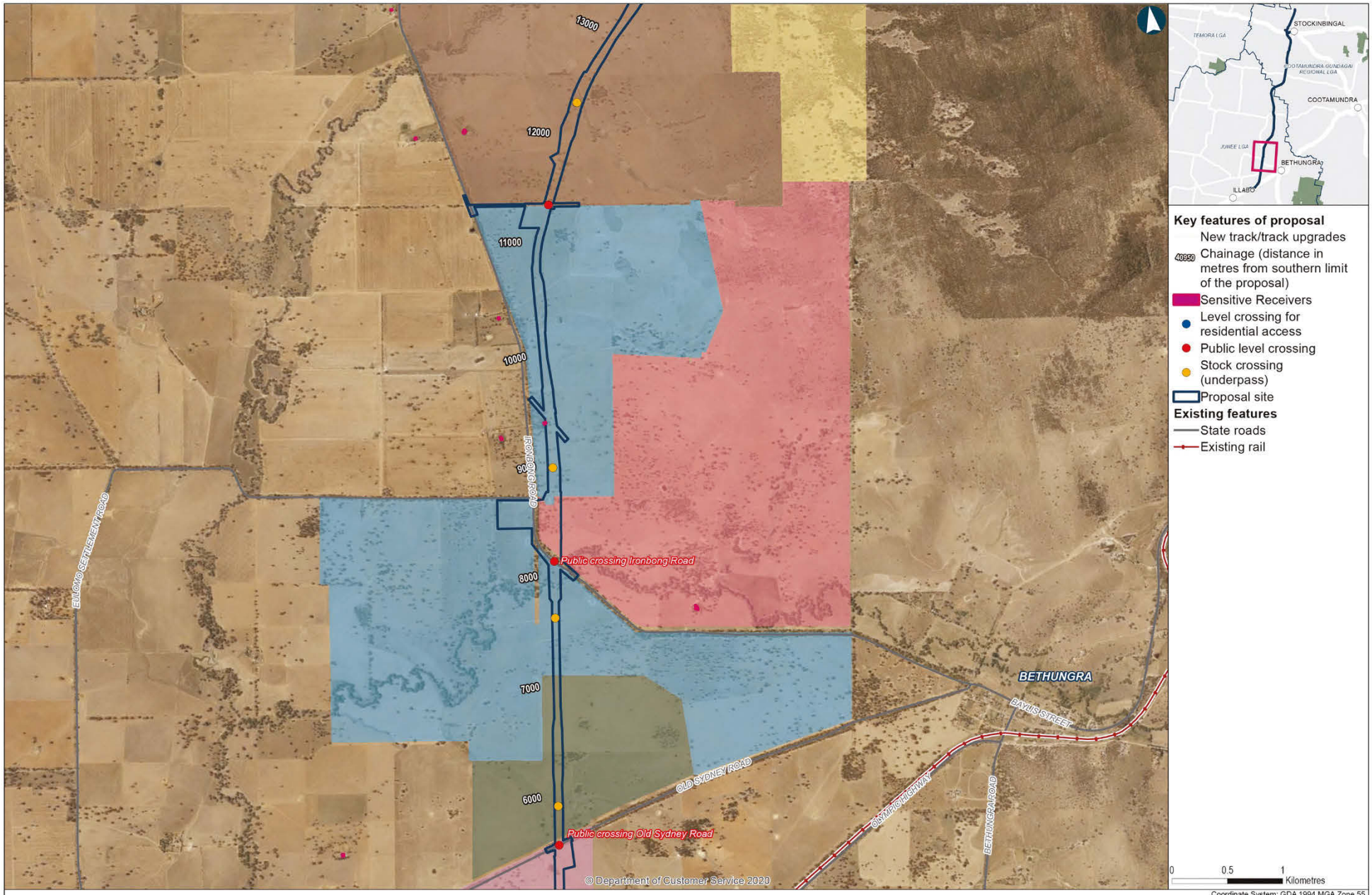
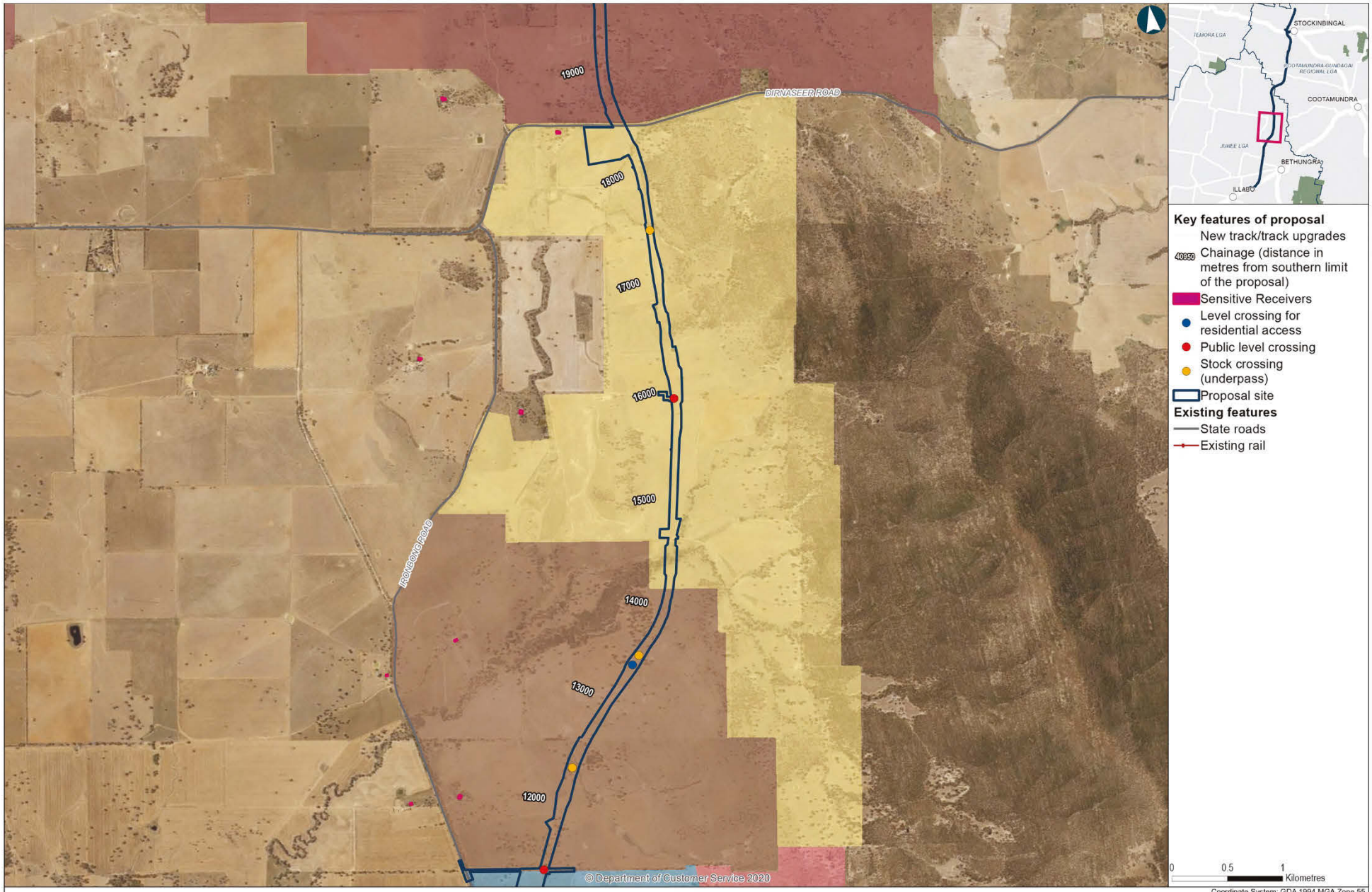


18.4 Farm accessibility measures provided by the Proposal



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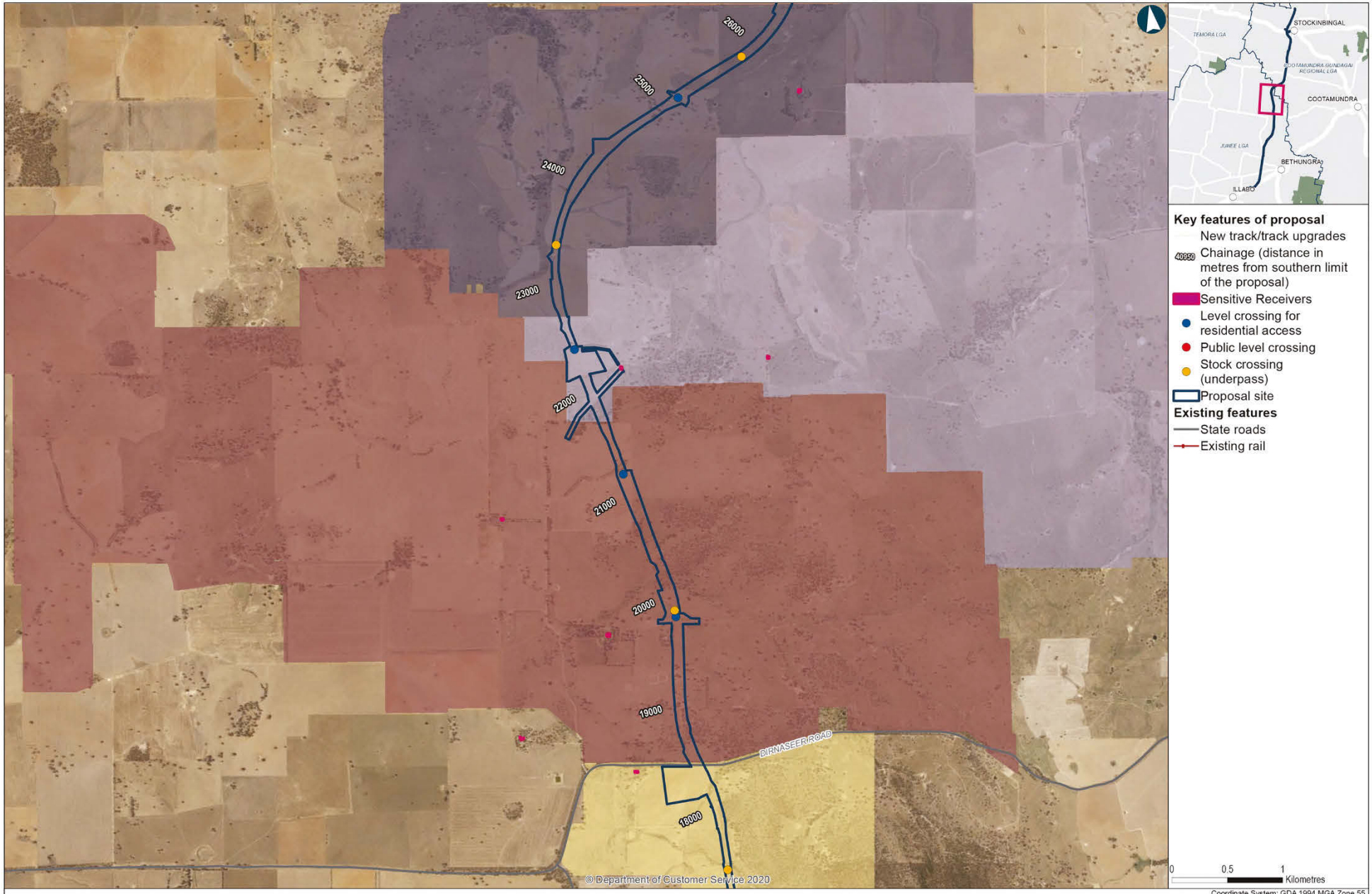

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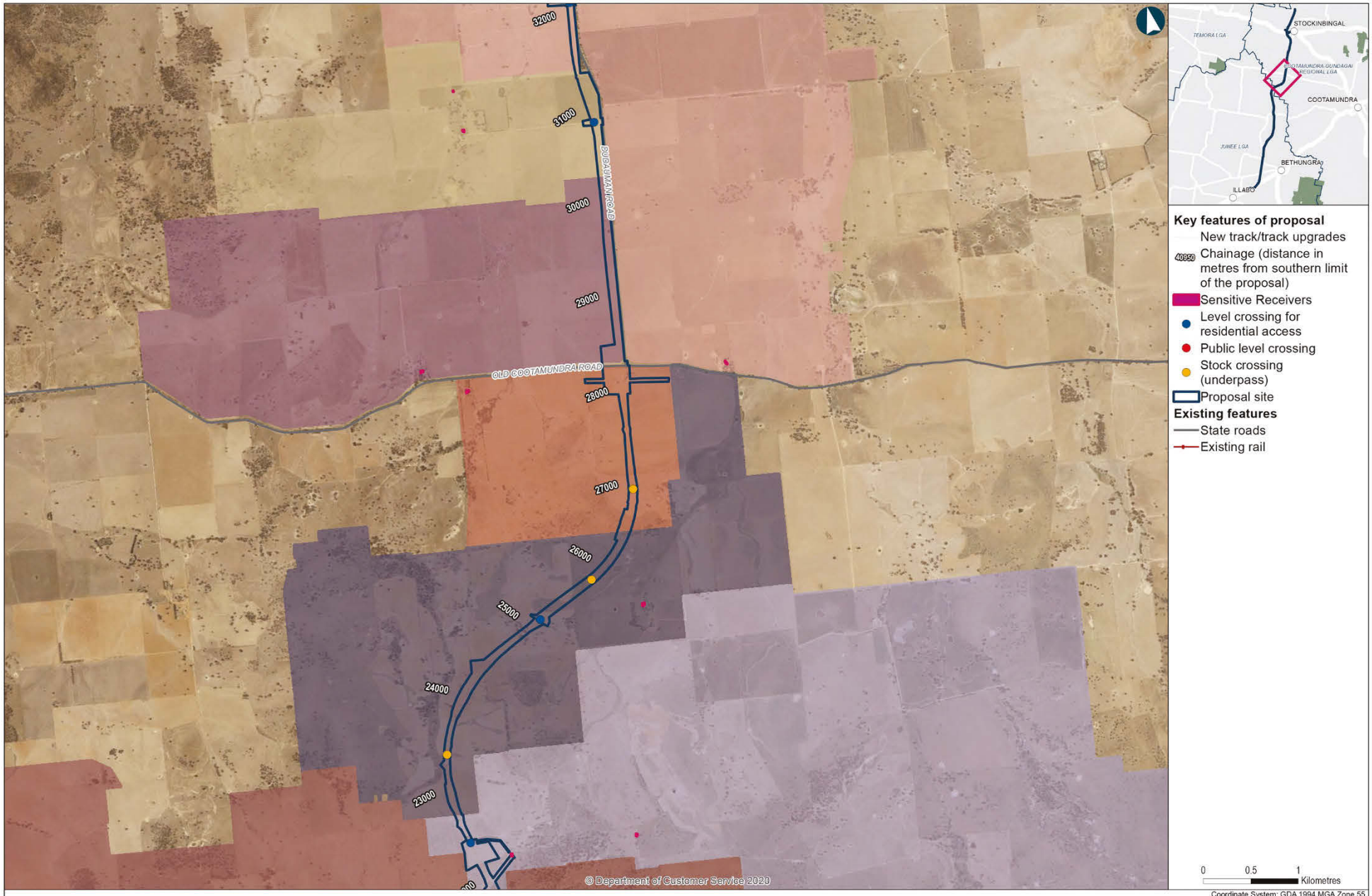

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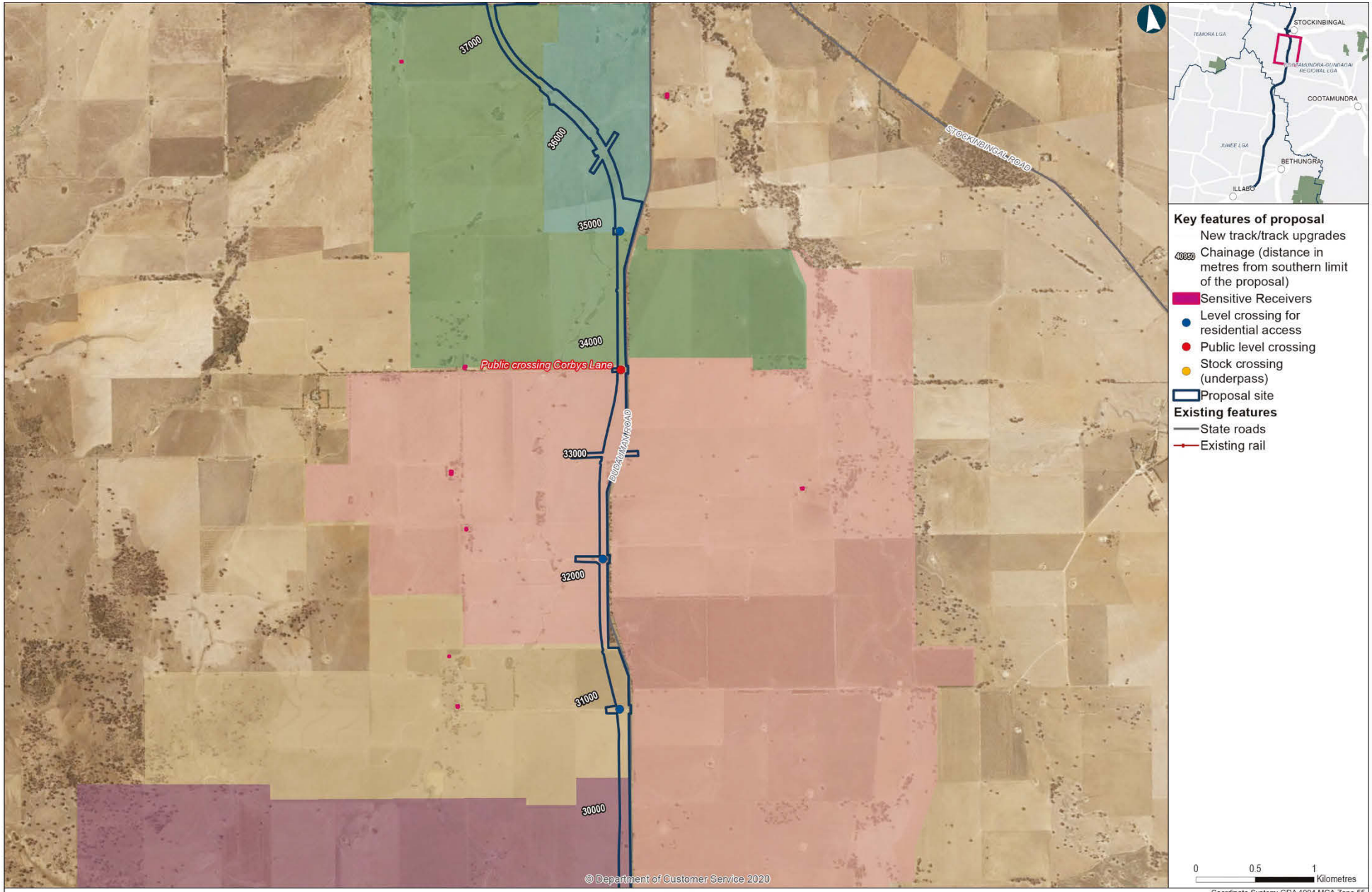

18.4 Farm accessibility measures provided by the Proposal

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Data Sources: ####

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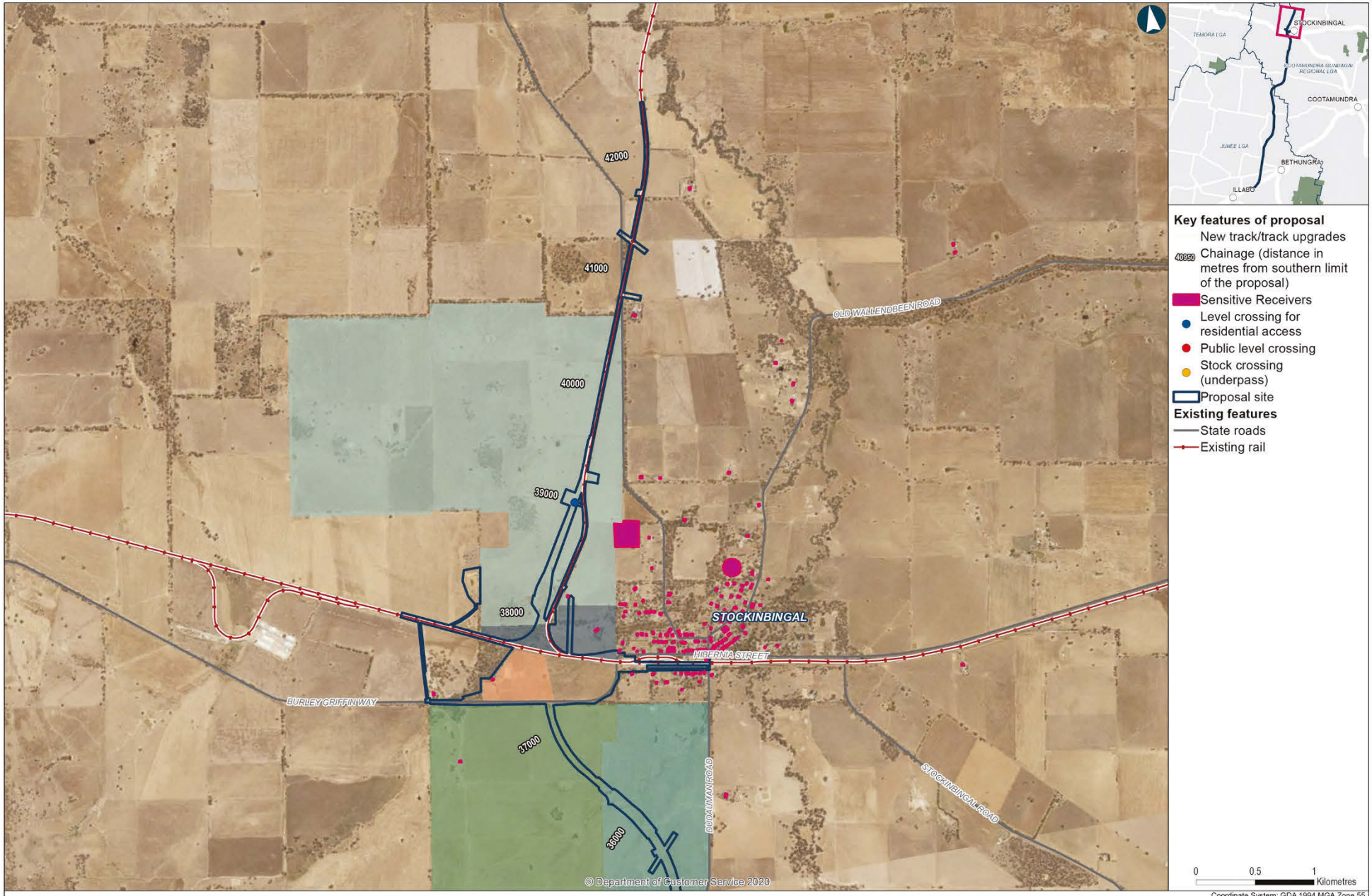


18.4 Farm accessibility measures provided by the Proposal

Data Sources: ####

18.3.4 Mining exploration and petroleum leases and licences

There are no known operational mines in the study area. The following exploration licences apply to land within the study area:

- EL8851 (Minerals)—to the north of Illabo
- EL8767 (Minerals)—to the south and east of Illabo
- EL8994 (Minerals)—to the east of Stockinbingal
- EL6768 (Minerals)—to the west of Illabo.

There is not known to be any exploration activity relevant to the proposal site occurring as part of these licences.

There are no known extractive resource sites within the study area.

18.3.5 Travelling stock reserves, livestock highways, Crown land and road reserves

TSRs are parcels of Crown land reserved under the *Crown Land Management Act 2016* (NSW) (Crown Land Management Act) for use by travelling stock. TSRs include stock routes which are corridors on Crown lands that connect smaller watering and camping reserves. Stock routes may also be alongside public roads. The proposal site does not cross any TSRs.

A livestock highway, although not a TSR under the Crown Land Management Act, is a public road used for the movement of travelling stock.

Figure 18-5 shows the existing livestock highway and TSRs in the vicinity of the proposal. The livestock highway currently crosses the existing Stockinbingal-Parkes Line on Grogan Road with a level crossing.

There are a number of locations where the proposal alignment interfaces with the public road network as detailed in Chapter 6: Alternatives and proposal options.

18.3.6 Biosecurity

Several methods were used to determine historical, current and potential biosecurity impacts of the study area, including:

- desktop review of publicly available information relevant to biosecurity risks, including The Riverina Regional Strategic Weed Management Plan 2017-2022 (NSW LLS, 2017) and the Riverina Regional Strategic Pest Animal Management Plan 2018-2023 (NSW LLS, 2018)
- review of ARTC-led consultation with landowners and other stakeholders
- consideration of the potential for impacts on property during construction and operation
- results of field surveys completed as part of the Technical Paper 1.

18.3.6.1 Weeds

Regional weed issues

The *Riverina Regional Strategic Weed Management Plan 2017–2022* (NSW LLS, 2017) was developed under the BC Act. Key weeds for the study area that are regulated under the BC Act include:

- state level priority weeds:
  - prevention—parthenium weed and Mexican feathergrass
  - eradication—boneseed
- weeds of national significance: African boxthorn, blackberry and silver-leaf nightshade
- regional priority weeds:
  - prevention—Parkinsonia, tropical soda apple, Chinese violet and horsetail
  - eradication—serrated tussock, bitou bush, Chilean needle grass, gorse, cane needlegrass, Coolatai grass, mother of millions, perennial ground cherry, prairie ground cherry and ragwort, Montpellier broom, Scotch broom
  - containment—ox-eye daisy
- all other weeds listed in Appendix 2 of the Weed Management Plan.

Weeds identified within the study area

Weeds known to be present within the study area were identified through a survey of crop weeds in southern NSW completed in 2012 (Broster et al., 2012), field studies, landholder engagement and biodiversity surveys (refer to Chapter 10: Biodiversity (including aquatic).

The key weeds identified to be present in the study area included:

- African box thorn
- Bathurst burr
- Buffalo burr
- Cathead (caltrop)
- Capeweed
- Field bindweed
- Horehound
- Khaki weed
- Melons (paddy and camel)
- Brome grass
- Milk thistle
- Skeleton weed
- Toad rush
- Wild oats
- Pepper tree
- Paterson's curse
- Serrated tussock
- St John's wort
- Thistle—black
- Thistle—Illyrian
- Thistle—saffron
- Thistle—Scotch
- Thistle—star
- Wild radish
- Wild turnip
- Noogoora burr
- Hairy panic
- Annual ryegrass
- Barley grass
- Wireweed
- Silverleaf Nightshade
- Johnson grass
- Blackberry
- Scotch broom
- Alligator weed
- Common prickly pear
- Perennial ground cherry
- Bridal creeper
- Smooth tree pear
- African olive
- Paspalum
- Onion grass
- Sweet briar.

18.3.6.2 Livestock pests and diseases

Three main biosecurity risks for livestock have been identified in the study area:

- footrot
- Ovine Johne's disease (OJD)
- sheep lice.

All three risks are currently present in the region and have negative impacts on the productivity of sheep enterprises within the study area. Under the Biosecurity Act, sheep footrot and OJD are *prohibited matter* and *notifiable diseases*.

Footrot is a contagious bacterial disease of sheep and goats with significant costs associated with the control of the disease within affected flocks. OJD is an incurable infectious disease that can result in significant economic losses. Sheep lice causes significant losses in sheep enterprises due to treatment costs, reduced wool growth and lower meat production.

Pests and diseases of cattle are also relevant, given the prevalence of cattle in the study area; in particular, bovine Johne's disease (BJD) is a *notifiable disease* in NSW (DPI, 2017).

Both sheep and cattle, the two most common livestock produced in the study area can be infected by internal parasites that add a further biosecurity livestock risk.

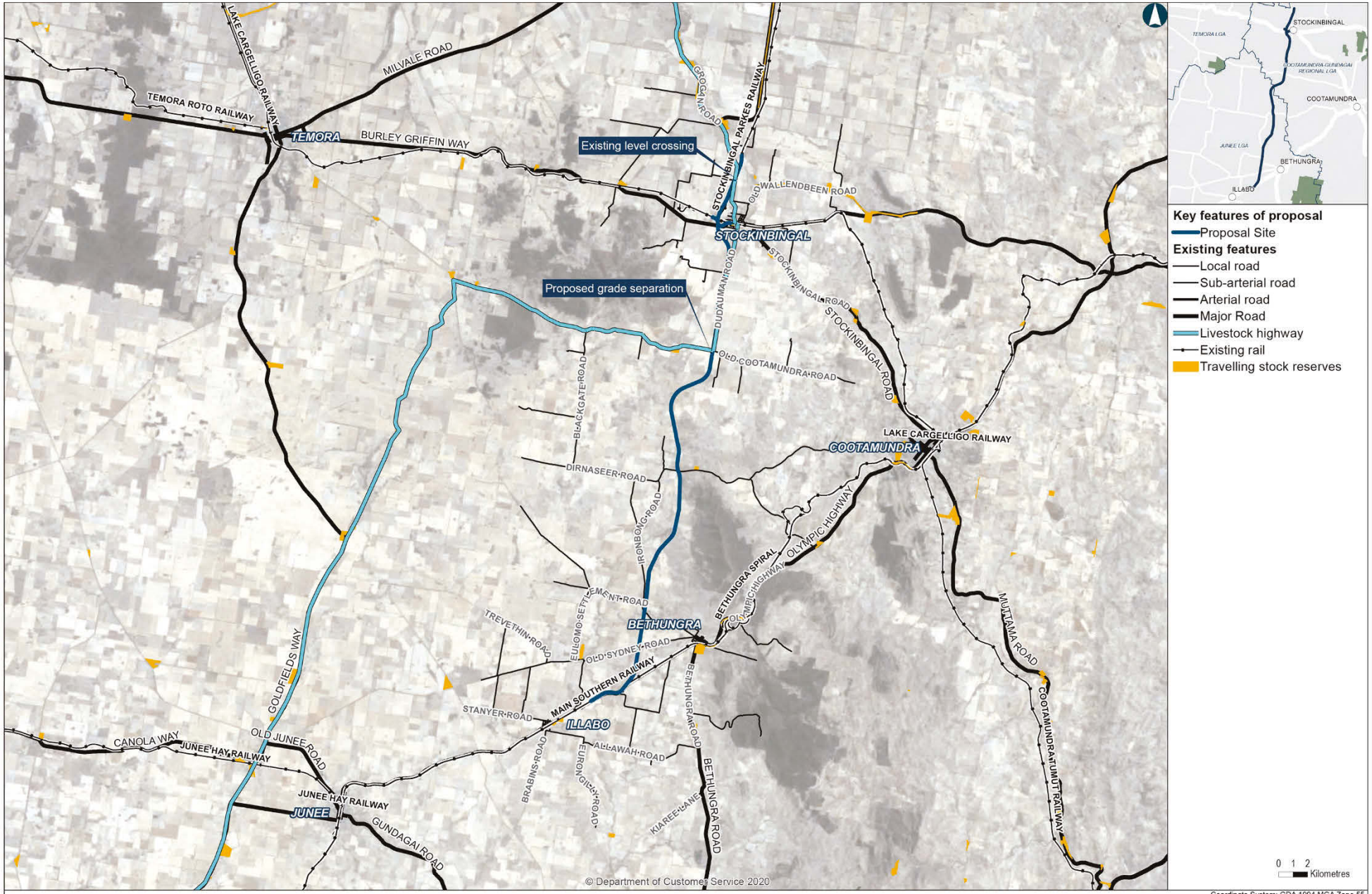
18.3.6.3 Vertebrate pests

Under the Biosecurity Act, pest animals are not defined by species. Pest species can be considered as any species (other than native species) that present a biosecurity threat. The *Riverina Regional Strategic Pest Animal Management Plan 2018–2023* (NSW LLS, 2018) was developed under the Biosecurity Act. The management plan covers introduced terrestrial vertebrate species and freshwater aquatic species that require a co-ordinated cross tenure approach to pest management. Pest animals for the Riverina region have been prioritised based on the level of risk and the feasibility of control.

The management plan lists six vertebrate pests: European red fox, feral goats, feral pigs, wild deer, wild dogs and wild rabbits for asset-based protection (protecting assets and manage pest animal populations). Specific management strategies are specified for each of these pests.

18.3.6.4 Other biosecurity risks

Cropping activities are at risk from a range of diseases and pests, although landholder consultation did not identify any current risks in the study area.



18.5 Travelling Stock Reserves and Livestock Highways

Coordinate System: GDA 1994 MGA Zone 55
Paper size: A3 Scale: 1:250,000
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Data Sources: ####

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18.4 Impact assessment—construction

This section describes the potential impacts of the proposal during the construction phase. Construction impacts involve both temporary and permanent land use and property impacts. Potential impacts relating to the viability and management of affected properties are addressed in section 18.6.

18.4.1 Land requirements

Construction of the proposal would require the temporary use of land as the construction footprint (see section 18.4.1.1). The operation of the proposal would require the permanent use of land as the operational footprint (see section 18.4.1.2).

It is noted that the land requirements are based on preliminary estimates, which would be refined and confirmed as the design and construction planning progress. The total land (permanent and temporary) required for construction of the proposal is approximately 612 ha, with approximately 458 ha comprising the permanent land requirement and around 154 ha comprising the temporary land requirements for construction.

Under the current Land Acquisition Strategy, it is proposed to complete all acquisitions of directly impacted land prior to the commencement of construction. Land acquisition is the gaining of land, or of any interest in land, for the proposal. The permanent acquisition of private land for the proposal is approximately 476.4 ha from 26 private owners. Total permanent acquisition of public land (Crown land, Crown roads, council roads and Transport for NSW (TfNSW) roads) is approximately 12.6 ha. The acquired land will be used to provide the required land for the proposal.

18.4.1.1 Temporary land requirement

In addition to the indicative permanent land requirements described below, some land would be required during construction only. This land would be temporarily required for some construction infrastructure and compounds not located within the operational footprint, to:

- establish the key construction infrastructure described in Chapter 8: Proposal description—construction
- provide access to construction work areas
- facilitate manoeuvring of construction plant and machinery.

It is estimated that approximately 154 ha of land would be temporarily required for the proposal. This land would be rehabilitated and returned to its current use post construction. At an annual value of $586 per ha, the temporary loss of agricultural production is estimated at $101,964 per annum.

It is noted that the construction footprint is preliminary based on buffers applied to the design. Further refinement would be undertaken during further design development. In addition, the extent of land subject to acquisition would comprise complete lots, such that the extent of land initially acquired would likely exceed the construction footprint; however, following construction of the proposal, land surplus to ongoing operational requirements would be made available for purchase where appropriate.

18.4.1.2 Permanent land requirement

The permanent land requirements comprise the operational footprint required for the proposal's functional and operational infrastructure (described in Chapter 7: Proposal description—operation).

It is estimated that approximately 458 ha of land would be permanently required for the proposal.

These permanent land requirements would directly affect about 43 lots that form approximately 19 farms (as per snapshot established during community consultation at the time of route optimisation shown in Figure 18-4).

18.4.2 Agricultural land use impacts

18.4.2.1 Agricultural land and land capability

Construction works and associated land requirements (permanent and temporary) would have a range of potential impacts on agricultural resources, depending on the different stages of construction. In addition to land use change, construction has the potential to directly affect land capability, with the potential to reduce the productive potential of agricultural land.

The temporary loss of land for construction (see section 18.4.1.2) is land that is intended to be rehabilitated and available for agricultural use once construction is complete.

The permanent loss of agricultural land (see section 18.4.1.2) would reduce agricultural yields and income for farm operators. The majority of affected land is currently used for grazing or cropping. There is no significant, commercial irrigated agriculture in the study area.

The total temporary and permanent affected land represents about 0.18 per cent of agricultural land in the study area (ABS, 2017b). No biophysical strategic agricultural land was identified in the proposal site. Approximately 65 per cent of affected land would be class 3 (high capability) land, with the remaining land comprising a mix of class 4 and 6 land.

18.4.2.2 Impacts on farm infrastructure and farming operations

Farm severance and lot realignment

As a result of the linear nature of the proposal, the key potential impact on farming operations relates to farm severance. This could occur where the new rail corridor or the realignment of Burley Griffin Way result in part of an overall farm being physically separated from the remainder of the farm (either temporarily or permanently). Figure 18-4 shows a snapshot of the indicative farm make up established through community consultation at the time of route optimisation. Farm severance could permanently disrupt the overall configuration of a farm, affect efficiency, productivity and viability. This could occur, for example, as a result in changes in access arrangements for the movement of farm machinery or stock movements to different areas of a farm. Additional capital investment could be required to replace current infrastructure (e.g. livestock handling yards) in some locations.

Realignment of paddocks as a result of severance could affect the sustainability, productivity and profitability of individual paddocks that have previously been set up for controlled traffic (tramline) and precision farming systems. Controlled traffic (tramline) farming systems are built using permanent wheel tracks. Farm machinery implements have a specific span and are confined to specific lanes, improving profitability and sustainability. The realignment of lots could cause issues where farm machinery can no longer achieve the efficiencies in long continuous runs and new crops are unable to achieve the previous yields on compacted soils if new tramlines have to be established. This may result in the reduction in crop yields in some locations.

Some severed portions may become unviable due to the size of the remaining area, configuration or access.

Access impacts

The proposal also has the potential to affect internal access arrangements within properties, including internal farm access tracks/roads. Internal farm access roads have been constructed to provide maximum efficiency, and provide all-weather access to hubs and key infrastructure (including homesteads). Severance could result in the isolation of farming operation hubs. Figure 18-4 shows the current access and the proposed level crossings and underpasses to retain connectivity of farm infrastructure that will be severed by the rail corridor.

In addition to access within properties, construction could also impact farming operations by temporarily affecting access to properties as a result of blockages, temporary rationalisation of access points, any damage to roads from heavy vehicles, and an inability to access key infrastructure during flood events. Further information on the potential for access impacts during construction, and the approach to managing these impacts, is provided in Chapter 11: Traffic, transport and access.

Access will be, as far as reasonably practicable, maintained through existing access points or suitable alternative locations.

Other impacts

Other potential direct impacts on farm infrastructure and farming operations could occur as a result of:

- impacts on soil and/or surface or groundwater resources/supplies
- inadvertent damage to property/farm infrastructure
- impacts on livestock fencing that could result in unintended livestock risks
- impacts on animal welfare and stock behaviour.

Potential indirect impacts on agricultural production could occur as a result of construction activities on adjoining areas, which could affect the ability of landholders to fully utilise the productive capacity of their land. These include:

- interrupted management of various crop and livestock husbandry operations, such as weed spraying and harvesting
- dust (affecting crops and pastures), noise and light (affecting grazing patterns of livestock)

- reduction in water availability
- competition for labour supply
- reduced throughput for local agricultural supply, marketing and transport services as a result of a reduction in total agricultural production.

The main impact expected as a result of any combination of these types of impacts is increased time and costs for farm owners/operators. Typically, farms have been physically set up to maximise efficiency, productivity and profitability. Any requirement to reduce or displace this set up has the potential for negative impacts on the effective functioning of farm operations. The extent and significance of these potential impacts would vary across individual properties.

The potential economic impacts on agricultural production are considered in Chapter 17: Social and economic.

18.4.2.3 Biosecurity risks

The productivity and profitability of agricultural production depends, in part, on the management of pests and diseases, including the prevention of incursion of pests and diseases onto properties. Biosecurity is a term that is commonly used for such management and the set of measures adopted to protect a property from the entry and spread of pests, diseases and weeds.

The Biosecurity Act provides a framework for the prevention, elimination and minimisation of biosecurity risks. The General Biosecurity Duty under the Biosecurity Act requires a person who deals with a biosecurity risk and ought reasonably to know it must ensure (as far as reasonably practicable) that the risk is prevented, eliminated or minimised. In practical terms this requires people to be aware of their surroundings and take action to prevent the introduction and spread of pests, diseases, weeds and contaminants. The Biosecurity Regulation 2017 (NSW) sets out a range of additional mandatory measures for biodiversity risk management.

If a new weed, pest or disease becomes established, it can affect agricultural properties through increased costs (for monitoring, production practices, additional chemical use and labour), reduced productivity (in yield and/or quality) or loss of markets.

The proposal would result in the increased movement of vehicles and people to, around and within the proposal site during construction. The main biosecurity risk relates to the spread of weeds that may result from the increased movement of vehicles. Weed seeds could be transported through and within the site on clothing and via vehicle wheels and undercarriages.

The potential implications for adjoining landowners include:

- dependency on the construction contractor to undertake weed control (spraying and grazing) within the worksite
- the need for additional weed, pest and disease inspections and controls required on adjoining land
- impacts on productivity from introduced weeds, pests and diseases
- impacts on human health and biodiversity.

18.4.3 Other land use impacts

18.4.3.1 Impacts on travelling stock reserves, livestock highways and Crown land

The proposal does not cross or directly impact any TSRs.

A livestock highway utilises the same roads as three of the proposed construction routes to the proposal site as shown in Figure 18-5, namely along the roads:

- Olympic Highway
- Goldfields Road
- Old Cootamundra Road
- Dudauman Road
- Grogan Road.

The construction vehicle movements could also pose additional risks for the transport of livestock along the livestock highway as a result of construction traffic volumes on these roads and associated intersections.

The proposal will cross the livestock highway at Old Cootamundra Road. This is a proposed grade separation with a road underbridge and is planned to be constructed over a six-day period. Two-lane access is planned to be maintained during this construction period, apart from during the Super T landing, which will require up to a two-hour closure and one lane alternate flow for the remainder of the day. This change to traffic conditions during construction may result in delays to usual farm operations as farmers will seek to minimise interactions with construction work traffic. Farmers will most likely avoid using the livestock highway over the six-day construction period of the Super T landing, which could result in delays or the need to use different, more expensive, modes of transport for stock during this period.

18.4.3.2 Impacts on mining and extractive industries

No direct impacts are expected on mining and extractive industries by construction activities as there are no known operational mines in the study area. There are no known extractive resource sites within the study area.

18.4.3.3 Impacts on non-agricultural land uses

Land uses and properties within the Stockinbingal and Illabo townships are not expected to be directly affected by impacts associated with construction. Construction works on Burley Griffin Way and the rail corridor through Stockinbingal village area are generally expected to be within the existing road and rail reserves.

18.5 Impact assessment—operation

This section describes the potential impacts of the proposal during the operation phase. Operation impacts are usually permanent. Potential permanent impacts relating to the viability and management of affected properties are addressed in this section.

18.5.1 General land-use impacts

Direct impacts on land use during operation would result from the permanent land requirements and the presence of operational rail and road infrastructure within the operational footprint. The total permanent land required for operation of the proposal is approximately 458 ha. Under the current Land Acquisition Strategy, it is proposed to complete all acquisitions of directly impacted land prior to the commencement of construction.

At an annual value of $586 per ha, the permanent loss of agricultural production is estimated at $268,388 per annum (ABS, 2017b). The greatest permanent impact is on cropping land that can also be used for grazing.

Approximately 65 per cent of land affected during construction would be class 3 (high capability) land, with the remainder being a mix of class 3, 4 and 6 land.

Operation would result in a permanent change in the use of the above land, from the existing land uses to a transport (rail or road) use.

18.5.2 Agricultural land-use impacts

18.5.2.1 Agricultural land and land capability

It is estimated that the permanent (operational) land requirements would result in about 458 ha of land being removed from agricultural production. This represents about 0.13 per cent of agricultural land in the study area (ABS, 2017a). This loss of productive land is expected to have a minimal impact on overall agricultural output across the region.

There could also be a permanent change in land use from cropping to grazing in some areas due to reconfiguration of paddocks, which could occur following return of land temporarily occupied during construction only (see section 18.4.1) and/or property severance impacts (see section 18.4.2.2 and following).

The greatest impact is on high capability agricultural land, which is approximately 65 per cent of the affected land.

18.5.2.2 Impacts on farm infrastructure and farming operations

The potential issues and impacts described in section 18.4.2.2 would continue to be relevant during operation for those properties affected by the proposal's permanent land requirements.

Property severance has the potential to result in ongoing additional time and costs in moving livestock and machinery between severed parcels of land, making farm operations less efficient and practical. Additional capital investment could be required to replace current infrastructure in some locations.

Property severance may also reduce the land capability and viability of some parcels of land as a result of reduced or impractical sizing of paddock parcels, requiring conversion to a lower yield of agricultural production, or even discontinuation of use of some parcels of land. This would require additional capital investment for any conversion activities and could affect the profitability of some farm holdings.

The impact of severance on farming operations is highly dependent on the circumstances of each farming business. Relevant factors include the nature of farming enterprise, the capacity of severed land to be accessed from on-farm operational hubs and the capacity of the enterprise to adapt to the changed operational circumstances. Measures to address severance impacts, including, but not limited to, amalgamation opportunities, would need to be considered on a property-by-property basis as part of the land acquisition process, consistent with Division 4 of Part 3 of the LA Act.

Fragmentation has been assessed at a farm scale, i.e. portions of a farm are separated by the rail corridor. The process reduces the size of the farm as well as potentially creating small areas fragmented from the remaining balance of the farm, which may be difficult to access and use.

Lots severed within the farm boundary are generally narrow along the rail corridor, ranging in size from 2.2 to 26 ha. Areas less than 30 ha may present management difficulties, and the impact of the severance of small areas can impact viability, as it may not be practical to continue operating small, fragmented areas as part of the original agricultural business.

It is considered unlikely that the decline in productivity due to fragmentation or severance into large areas will cause the loss of viability of the larger surrounding properties. As the severed lots form part of a larger farm area, the decline in productivity due to fragmentation is reduced at this scale.

It is unlikely that the impact of the proposal will cause the loss of viability of the smallest affected property holdings because they are unlikely to sustain full-time employment for operators due to their small size.

Permanent alterations to access arrangements may increase time and cost for the movement of agricultural machinery and livestock. Potential access impacts are considered in section 18.4.2.2. The provision of private accommodation level crossings and stock underpasses for connectivity will be determined during detailed design.

The movement of trains along the new rail line, together with changes to access arrangements across the rail line, has the potential to affect movement patterns for farm machinery and livestock that need to cross the rail corridor. Affected agricultural landholders may need to consider train movement patterns to assist with safe scheduling of routine agricultural activities.

18.5.2.3 Impacts on agricultural access across the rail corridor

The proposal will result in the restriction of movement across the rail corridor during operation to designated locations, which may result in delays to landowners. This may result in additional costs, making farm operations less efficient and practical. Additional or replacement infrastructure may be required in some locations.

The rail corridor will be fenced and designed to exclude stock and other animals from straying into the rail corridor at at-grade and below grade level crossings. Stock fencing must be in accordance with the Inland Rail fencing standards and be constructed prior to the removal of existing fencing or any works being carried out on the subject land, unless otherwise agreed with the landowner. Where fencing is required, the relevant landowner will select the type of fencing, in a like-for-like fashion from ARTC's standard fence and gate types, to suit the farm operations. Internal fencing matters will be considered, as appropriate, during in the land acquisition process. Use of at-grade stock crossings will be infrequently affected by the low number of daily train movements. Farmers will have access to the train timetable to plan livestock movements across at-grade stock crossings.

No direct livestock impacts are expected during operation; however, options for stock movements across/under the rail corridor will be reduced from the current situation.

18.5.2.4 Impacts on dam catchments and water supply

During consultation, landowners identified locations where water drainage lines that supply farm dams crossed the rail corridor (see Chapter 12: Hydrology and flooding). For those properties, which consultation was not undertaken with owners, likely locations were identified using external inspections and satellite imagery.

Water drainage lines to farm dams are natural or formed by purposed designed systems of contour banks and grassed watercourses. A drainage response would be required at these locations to ensure that the water catchment areas of the existing farm dams are maintained.

For existing water drainage lines impacted by the proposal site, without a culvert to channel water flow under the rail corridor and into an existing farm dam, the dam may become less effective as a source of livestock water. There is also a potential for disrupted drainage, even in a minor drainage line, that could result in a local increase in waterlogging and soil salinity, which could negatively impact agricultural production.

18.5.2.5 Biosecurity risks

Road vehicular movements along the rail corridor during operation would be limited to occasional maintenance vehicles using the operational access road within the corridor. Consequently, the risks for the dispersion of weeds would be low and would be managed in accordance with ARTC's standard maintenance procedures.

During operation, activities have the potential to:

- introduce and spread weeds (seeds and plant fragments)
- allow increased weed growth on exposed areas
- introduce and spread exotic diseases and pests of both plants and animals.

The potential implications for adjoining landowners include:

- exclusions from the rail corridor to undertake weed control (spraying and grazing)
- additional weed, pest and disease controls required on adjoining land
- impacts on productivity from introduced weeds, pests and diseases
- impacts on human health and biodiversity.

While any residual lands remain in ARTC's ownership/control, ARTC would continue to manage the land in accordance with the General Biosecurity Duty under the Biosecurity Act, the *Riverina Regional Strategic Weed Management Plan* (NSW LLS, 2017) and the *Riverina Regional Strategic Pest Animal Management Plan* (NSW LLS, 2018).

18.5.3 Impacts on future use, subdivision and development potential

The proposal has the potential to result in a change in the distribution of holding sizes as a result of land requirements and severance impacts.

Development controls within local environmental plans can restrict development and subdivision of the minimum lot size of Primary Production (RU1) zoned land is 100 ha in the Junee Shire Council area and 200 ha in the Cootamundra Gundagai Regional Council area. The proposal has the potential to create some smaller parcels of land. The size of the parcels and the remaining area, configuration and/or access arrangements may affect how these areas of land are used in the future. Access arrangements to improve connectivity in affected properties will be appropriately considered and implemented (as far as reasonably practical) during detailed design.

It is expected that amenity changes at properties along the rail corridor resulting from train operations would be intermittent throughout the day. The landscape and visual amenity of some areas close to the proposal site would change as a result of the proposed rail infrastructure (e.g. rail line, fencing, bridges and culverts) and train operations. The significance of impacts would depend on the location. Potential operational noise and visual impacts are considered in Chapter 16: Noise and vibration and Chapter 19: Landscape and visual impacts.

The proposal is unlikely to affect the capacity of urban zoned land within Illabo and Stockinbingal townships.

18.5.4 Other land-use impacts

During operation, property impacts would be associated with the permanent land requirements of the proposal (see section 18.4.1). This has the potential to reduce the amount of land available at a particular property and/or affect farming operations at agricultural properties. With some new lots resulting in lot sizes below the minimum lot size for the relevant LEP, future development could be restricted, e.g. residential dwelling houses are not permitted on lots below the minimum lot size under current planning controls.

18.5.4.1 Impacts on travelling stock reserves, livestock highways, Crown land and road reserves

Operation is not expected to have any impacts on Crown land.

Design optimisation considered operational impacts to roads and other infrastructure, and design options for each road–rail interface were developed in accordance with the policy framework outlined in Chapter 6: Alternatives and proposal options.

The proposal will cross Old Cootamundra Road, which is used as a livestock highway, as identified in section 18.3.5; however, the proposal includes a grade separation with a road under-bridge and hence the proposal is not expected to create any long-term impacts on the existing livestock highway as shown in Figure 18-5.

The proposal seeks to maintain access to properties by a reasonable public road route. This approach would minimise the potential for access impacts and would enable the functionally (use and management) the existing road reserve/land use to continue.

Once operational there would be a redundant section of the Burley Griffin Way south of Hibernia Street due to the realignment (see Chapter 7: Proposal description—operation. Consultation with TfNSW and Cootamundra-Gundagai Council would be undertaken to confirm any potential treatment or use of this section of road corridor.

18.5.4.2 Impacts on mining and petroleum licences

No impacts on mining and extractive industries are anticipated during operation as no exploration or mining licenses have been identified to be directly impacted by the proposal. The proposal would allow for potential connections of potential future mining and extractive industries to the rail network.

18.5.4.3 Impacts on non-agricultural land uses

Direct impacts to non-agricultural land uses and property are not anticipated during the operation of the proposal.

Near the townships of Illabo and Stockinbingal, the proposal connects to existing road and rail infrastructure, and does not impact land within the township. As such, it is not anticipated to significantly impact any potential future subdivision or urban development in the area.

Potential social and economic impacts are addressed in Chapter 17: Social and economic and changes to public roads are addressed in Chapter 11: Traffic, transport and access.

18.5.4.4 Services and utilities impacts

Operation is not expected to have any impacts on services and utilities.

18.5.4.5 Waterfront land and access for recreational fishing

All bridges and culverts have been, and would continue to be, designed with consideration to the *Guidelines for watercourse crossings on waterfront land* (DPI, 2012a). Where bridges are provided, the proposal is unlikely to impact accessibility for recreational fishing. Watercourses crossed using culverts are unlikely to impact recreational fishing, as the vast majority of watercourses are non-perennial.

18.6 Mitigation and management

18.6.1 Approach to mitigation and management

A land use and property management sub-plan would be prepared as part of the Construction Environmental Management Plan (CEMP), and construction of the proposal would be undertaken in accordance with this plan. All operational activities would be undertaken in accordance with ARTC's standard operating procedures and approvals relevant to the proposal.

18.6.2 Approach to managing the key potential impacts identified

The key approaches to managing the potential impacts identified would involve:

- minimising the construction and operation footprints as far as reasonably practicable
- managing the acquisition process in accordance with relevant requirements
- minimising the potential for direct impacts on properties; in particular, agricultural operations and infrastructure.

18.6.2.1 Minimising the construction and operation footprints

The design would continue to be refined to minimise the proposal's land requirements and associated property impacts as far as reasonably practicable. Consultation with landholders would be ongoing to identify opportunities to minimise impacts on property operations and farm infrastructure, where reasonably practicable.

18.6.2.2 Acquisition or lease arrangements

ARTC is responsible for undertaking land acquisition negotiations for Inland Rail on behalf of TfNSW. All property acquisitions would be managed by ARTC in accordance with the LA Act. It is TfNSW's preference to acquire land by negotiated agreement; however, a compulsory acquisition process may be required if agreement cannot be reached or is otherwise necessary.

ARTC would undertake the acquisition process for the proposal's permanent land requirements in accordance with the Inland Rail Acquisition Protocol Deed between ARTC and TfNSW.

Land required during construction only would be via a lease or memorandum of understanding with the relevant government agency or private landholder.

Acquisitions and leases on privately owned land, or land owned by the NSW/local government, would be carried out in accordance with the LA Act. Information about acquisitions under the Act can be viewed online at **finance.nsw.gov.au/land-property/land-acquisition-reform-2016**.

Compensation payable pursuant to section 55 of the LA Act generally includes, among other things, provisions for market value and disturbance items, such as associated legal costs, valuation fees, relocation and removal expenses, and mortgage costs (i.e. fees associated with the discharge of mortgages and creation of a new mortgage where relocation is required).

Depending on the individual circumstances of each land/business owner and the proposed impacts on the land and to operations, compensation may take the form of money or land/works—as agreed by the parties.

Managing property impacts

The approach to managing potential property impacts, particularly impacts on farm infrastructure and farming operations, would involve developing property-specific measures to manage the requirements at individual farms during the acquisition process. This would involve determining requirements, in consultation with individual landholders, for property-level responses during construction and operation.

During the property acquisition/leasing process, ARTC would seek to secure agreement with affected landholders, to guide property-level design requirements and the management of construction on, or immediately adjacent to, private properties. These may include:

- measures to minimise property impacts, including on agricultural operations
- specific requirements to ensure that operations, including the movement of livestock and farm machinery, are able to be maintained as efficiently as possible
- measures to manage severance impacts, where practicable, including appropriate access solutions and amalgamation opportunities (where available)
- required adjustments to affected structures.

The agreements would be prepared in accordance with ARTC's acquisition strategy for Inland Rail.

Property impacts would be compensated in accordance with the LA Act (as noted above) and with reference to *Determination of compensation following the acquisition of a business* (NSW Government, n.d.) (as appropriate).

Property owners and occupants would be consulted in accordance with the Inland Rail Communications and Engagement Strategy for the proposal. Consultation would ensure that owners/occupants are informed about the timing and scope of activities in their area, and any potential property impacts/changes, particularly in relation to potential impacts on access, services or farm operational arrangements. It would also assist in identifying feasible and reasonable property-specific measures where construction is located on, or immediately adjacent to, private properties and has the potential to affect farm operational arrangements.

18.6.3 Expected effectiveness

The mitigation measures specified in Table 18-3 are anticipated to reduce the likelihood and/or consequence of the identified risks. Developing property-specific measures to managing impacts at affected farms, in consultation with individual landholders, is expected to be the most effective measure to minimise the potential impacts of the proposal, where reasonably practicable.

18.6.4 Consideration of the interactions between mitigation measures

During construction, options for impact mitigation would depend on the specific activity being undertaken, and the location where it is occurring. For example, it would be the responsibility of the construction contractor to select and implement appropriate traffic controls in accordance with the construction traffic, transport and access management plan (see section 11.5).

Mitigation measures to manage the potential for traffic and access, air quality, noise, socio-economic, waste, and health and safety impacts would also assist in minimising the potential for land use and property impacts. In particular, measures to manage the potential for access impacts are provided in section 11.5.

Mitigation measures to minimise potential impacts to land use and property would also be implemented as part of those identified for Chapter 11: Traffic, transport and access, Chapter 12: Hydrology and flooding, Chapter 17: Social and economic and Chapter 25: Health and safety.

18.6.5 Recommended mitigation measures

Measures that will be implemented to address potential impacts on land use and property are listed in Table 18-3.

TABLE 18-3: LAND USE AND PROPERTY MITIGATION MEASURES

Ref	Impact	Mitigation measures	Timing
LP-1	Land use and property impacts, including severance and other impacts on operations	The design and construction planning would continue to be refined to minimise potential impacts on land uses and properties as far as reasonably practicable. This would include measures to manage severance impacts where practicable, including appropriate access solutions.	Detailed design/ pre-construction
LP-2	Acquisition and property impacts	All property acquisitions/adjustments would be undertaken in consultation with landowners and, where relevant, in accordance with the requirements of the *Land Acquisition (Just Terms Compensation) Act 1991* (NSW) (Land Acquisition Act). In line with the Land Acquisition Act, ARTC's preference is for acquisition by agreement where practicable.	Detailed design/ pre-construction
LP-3	Acquisition and property impacts	Individual property agreements would be developed in consultation with landowners/occupants, with respect to the management of construction on or immediately adjacent to private properties, where appropriate. These would detail any required adjustments to fencing, access, farm infrastructure, and relocation of any impacted structures as required.	Detailed design/ pre-construction
LP-4	Impacts of construction on private properties	Property owners and occupants would be consulted in accordance with the project-specific communication management plan to ensure that owners/occupants are informed about: ▸ the timing and scope of activities in their area ▸ any potential property impacts/changes, particularly in relation to potential impacts on access, services, or farm operational arrangements ▸ activities that have the potential to impact on livestock.	Detailed design/pre-construction
LP-5	Impacts of construction on private properties	Feasible and reasonable property-specific measures would be identified during detailed design in consultation with landholders. These would be implemented during construction, where construction is located on or immediately adjacent to private properties and has the potential to affect farm operational arrangements. The measures would include, as appropriate: ▸ arrangements in terms of works timing and practices ▸ any required adjustments to fencing, access, and farm infrastructure relocation of any impacted structures.	Detailed design/ pre-construction
LP-6	Maintaining permanent access to properties	Where any legal access to a property is permanently affected and a property has no other legal means of access, alternative access to and from a public road would be provided to an equivalent standard, where feasible and practicable. Where an alternative access is not feasible or practicable, and a property is left with no access to a public road, negotiations would be undertaken with the relevant landowner for acquisition of the property.	Detailed design/pre-construction

Ref	Impact	Mitigation measures	Timing
LP-7	Internal access arrangements	ARTC would consult with adjoining landowners regarding temporary construction impacts on viability and productivity. This may include consideration of temporary farm infrastructure to maintain farm management practices and/or modification of construction activities and footprint.	Detailed design/pre-construction
LP-8	Impacts on livestock	Stock fencing must be in accordance with the Inland Rail fencing standards and be constructed prior to the removal of existing fencing or any works being carried out on the subject land, unless otherwise agreed with the landowner. Where fencing is required, the relevant landowner will select the type of fencing in a like-for-like fashion from ARTC's standard fence and gate types, to suit the farm operations. Internal fencing matters will be considered, as appropriate, during the land acquisition process.	Detailed design/pre-construction
LP-9	Minimising impacts on routes used for stock movement	Local Land Services (LLS) would be consulted during detailed design to understand how impacts on routes used for stock movement can be minimised and managed during construction and operation. Alternative access arrangements would be made as required, subject to maintaining rail safety.	Detailed design/pre-construction
LP-10	Biosecurity	The biodiversity management plan included in the Construction Environmental Management Plan (CEMP) (mitigation measure BD-7) would include measures to minimise the potential for biosecurity risks during construction in accordance with the *Biosecurity Act 2015* (Cth). The biosecurity management plan would be developed with reference to the *Riverina Regional Strategic Weed Management Plan 2017-2022* (LLS, 2017) and in consultation with LLS and DPI.	Construction
LP-11	Access to properties	Access to individual residences, services and businesses, and for livestock across the rail corridor, would be maintained during construction, where reasonably practicable. The traffic, transport and access management plan included in the CEMP (mitigation measure T-4) would include measures in relation to property access during construction. Where alternative access arrangements need to be made, these would be developed in consultation with affected property owners/occupants and LLS for travelling stock reserves.	Construction
LP-12	Water supplies for farm operations	Farm water pipelines, dams and drainage channels would be replaced or reinstated to ensure continuity of stock and domestic water supplies prior to removal of existing impacted infrastructure.	Construction
LP-13	Bushfire risk	The flood and emergency response plan (mitigation measure HS-4) would include measures to minimise the potential for bushfire risks.	Construction
LP-14	Safe movement	Interface agreements would be required for all private crossings on Inland Rail and would be put in place to assist in the safe movement of stock and non-standard machinery across the rail corridor.	Operation

18.6.6 Managing residual impacts

Residual impacts are impacts of the proposal that may remain after implementation of:

- design and construction planning measures to avoid and minimise impacts (see Chapter 6: Alternatives and proposal options and Chapter 8: Proposal description—construction
- specific measures to mitigate and manage identified potential impacts (see section 18.6.5).

The key potential land use and property issues and impacts originally identified in Appendix G: Environmental risk assessment are listed in Table 18-4. The (pre-mitigation) risks associated with these impacts, which were identified by the environmental risk assessment, are provided. Further information on the approach to the environmental risk assessment, including descriptions of criteria and risk ratings, is provided in Appendix G.

The potential issues and impacts identified by the environmental risk assessment were considered as part of the land use and property assessment. The mitigation and management measures (listed in Table 18-3) that would be applied to manage these impacts are also identified. The significance of potential residual impacts (after application of these mitigation measures) is rated using the same approach as the original environmental risk assessment. The approach to managing significant residual impacts (considered to be those rated medium or above) is also described.

TABLE 18-4: RESIDUAL IMPACT ASSESSMENT—LAND USE AND PROPERTY

Phase	Potential impacts	Pre-mitigated risk			Mitigation measures (refer to Table 18-3)	Residual risk			How residual impacts would be managed
		Likelihood	Consequence	Risk rating		Likelihood	Consequence	Risk rating	
Construction	▸ Effects on access to and within properties as a result of changes to private access roads and internal access arrangements.	Almost certain	Major	Very high	LP-1 to LP-7, LP-12	Likely	Moderate	High	Feasible and reasonable property-specific measures would be identified during detailed design in consultation with landholders. These would be implemented during construction, where construction is located on or immediately adjacent to private properties and has the potential to affect farm operational arrangements.
	▸ Indirect impacts on agricultural land use/production and livestock from construction activities, including impacts from changes to access, noise and air pollution.	Likely	Minor	Medium	LP-1, LP-8 to LP-10	Unlikely	Minor	Low	n/a
	▸ Temporary changes to land use as a result of the proposal's land requirements during construction—temporary leasing of additional areas outside the operational footprint to facilitate construction negatively affects the availability of land for other uses.	Almost certain	Moderate	High	LP-1, LP-7	Likely	Minor	Medium	ARTC would consult with adjoining landowners regarding temporary construction impacts on viability and productivity. This may include consideration of temporary farm infrastructure to maintain farm management practices and/or modification of construction activities and footprint.
	▸ The movement of construction machinery and materials introduces biosecurity risks, including the spread of weeds.	Possible	Moderate	Medium	LP-11	Unlikely	Minor	Low	n/a

Phase	Potential impacts	Pre-mitigated risk			Mitigation measures (refer to Table 18-3)	Residual risk			How residual impacts would be managed
		Likelihood	Consequence	Risk rating		Likelihood	Consequence	Risk rating	
	▸ Impacts on agricultural land use from construction activities, including impacts from reduced access, noise and air pollution.	Likely	Minor	Medium	LP-8 to LP-10, LP-13, LP-15	Unlikely	Minor	Low	n/a
	▸ Impacts on land use as a result of property acquisition.	Likely	Moderate	High	LP-3	Likely	Minor	Medium	Individual property agreements would be developed in consultation with landowners/ occupants, with respect to the management of construction on or immediately adjacent to private properties, where appropriate. All property acquisitions/ adjustments would be undertaken in consultation with landowners and, where relevant, in accordance with the requirements of LA Act. In line with the LA Act, ARTC's preference is for acquisition by agreement where practicable.
Operation	▸ Severance of properties resulting in smaller lot sizes that may affect existing use and/or development potential.	Almost certain	Moderate	High	LP-1 to LP-5	Possible	Moderate	Medium	Potential impacts would be managed through appropriate measures identified in consultation with affected landholders and defined in the individual property agreements.
	▸ Severance of properties resulting in changes to the arrangement of properties that may affect agricultural use and productive capacity.	Almost certain	Moderate	High	LP-1 to LP-7	Possible	Moderate	Medium	Potential impacts would be managed through appropriate measures identified in consultation with affected landholders and defined in the individual property agreements.

Phase	Potential impacts	Pre-mitigated risk			Mitigation measures (refer to Table 18-3)	Residual risk			How residual impacts would be managed
		Likelihood	Consequence	Risk rating		Likelihood	Consequence	Risk rating	
	▸ Effects on access to and within properties as a result of changes to private access roads and internal access arrangements.	Almost certain	Moderate	High	LP-3	Unlikely	Minor	Low	n/a
	▸ Land permanently required for the proposal affects the productive capacity of individual properties.	Possible	Major	High	LP-1 to LP-7	Possible	Moderate	Medium	Potential impacts would be managed through appropriate measures identified in consultation with affected landholders and defined in the individual property agreements.
	▸ Land permanently required for the proposal results in a change to land use in the study area, negatively affecting the availability of land for non-transport related uses (including changes to the availability of agricultural zoned land).	Possible	Moderate	Medium	LP-1 to LP-5	Unlikely	Minor	Low	n/a
	▸ Impacts due to changes in infrastructure, including increased waiting times at level crossings and safe holding distances for large vehicles affecting agricultural land access.	Likely	Minor	Medium	LP-6 to LP-7, LP-15	Possible	Minor	Low	n/a