CopperString 2.0

Environmental offsets

Volume 2 Chapter 21

Table of Contents

Table index

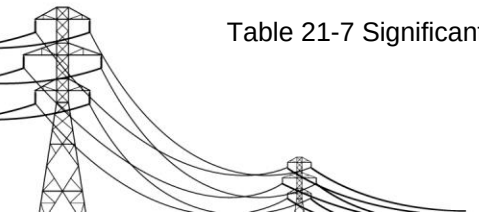
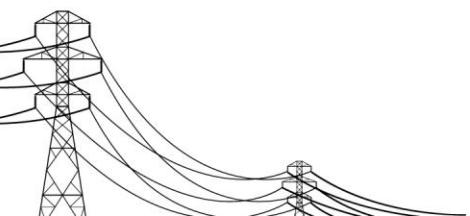


Figure index



21. Environmental offsets

21.1 Introduction

21.1.1 Objectives

This chapter of the Environmental Impact Statement (EIS) aims to identify any residual Project impacts to matters of conservation significance under Commonwealth and State legislation, once relevant avoidance and mitigation measures have been applied, and make provisions to offset such impacts. The following objectives have been met:

- Identify where the Project will result in significant residual impact (SRI) to Matters of National Environmental Significance (MNES) and Matters of State Environmental Significance (MSES)
- Prepare an offset strategy to identify the environmental offset requirements

21.1.2 Purpose of chapter

The purpose of this environmental offsets strategy is to:

- Summarise the Commonwealth and Queensland legislative context for offset requirements and policies
- Identify the environmental values existing within the Project area that, after avoidance, minimisation, mitigation and remediation measures have been applied, may require offsetting for residual impacts
- Outline the offsets investigations and securing approach to be adopted by the Project
- Demonstrate delivery and acquittal of the offsets requirements within the Terms of Reference

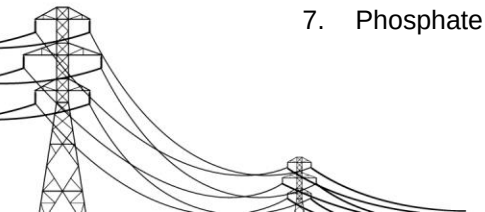
21.1.3 Project overview

The CopperString 2.0 Project (the Project) involves the construction and operation of approximately 1,060 km of extra high voltage overhead electricity transmission line that will extend from Mount Isa to the Powerlink transmission network, via a new connection point at Woodstock, south of Townsville.

The Project involves construction of seven new substations at Woodstock, Hughenden, Dajarra Road (Cloncurry), Mount Isa, Selwyn, Cannington Mine and Phosphate Hill Mine as well as additional temporary and permanent infrastructure. The Project is described in detail in Volume 1 Chapter 2 of the EIS.

For reference within this document and as per the proposed staging of the construction phase, the Project has been divided into the following eight sections, as shown in Figure 21-1:

1. Woodstock Substation (included in Renewable Energy Hub corridor section)
2. Renewable Energy Hub
3. CopperString Core
4. Mount Isa Augmentation
5. Southern Connection
6. Cannington Connection
7. Phosphate Hill Connection



8. Kennedy Connection (option – not included as part of this assessment)

21.1.4 CopperString 2.0 Project - Terms of Reference

On the 26 April 2019, the Coordinator-General declared the Project to be a 'coordinated Project' under s26 of the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act). The Terms of Reference (ToR) set out the following specific matters to be addressed in the EIS relating to offsets:

12.27 Identify whether the Project will result in a significant residual impact on MSES, requiring an offset with reference to the Queensland Environmental Offsets Policy and Significant Residual Impact Guideline 2014 (see Appendix 1) and the Queensland Environmental Offsets framework.

12.148 The MNES chapter must include an assessment of the likelihood of residual significant impacts occurring on listed threatened species and communities, and listed migratory species after avoidance, mitigation and management measures relating to the Project have been applied. If it is determined that a residual significant impact is likely, include a draft Offset Management Strategy (as an appendix to the EIS) that provides, at a minimum:

(a) details of the environmental offset/s (in hectares) for residual significant impacts of the proposed action on relevant MNES, and/or their habitat;

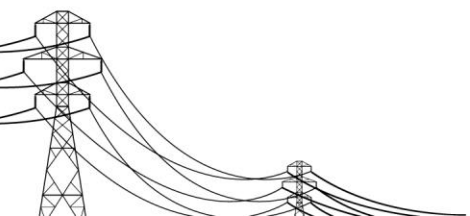
(b) details of how the environmental offset/s meets the requirements of the Department's EPBC Act Environmental Offsets Policy (2012) (EPBC Act Offset Policy), including the Offsets Assessments Guide, available at: ***www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy****;*

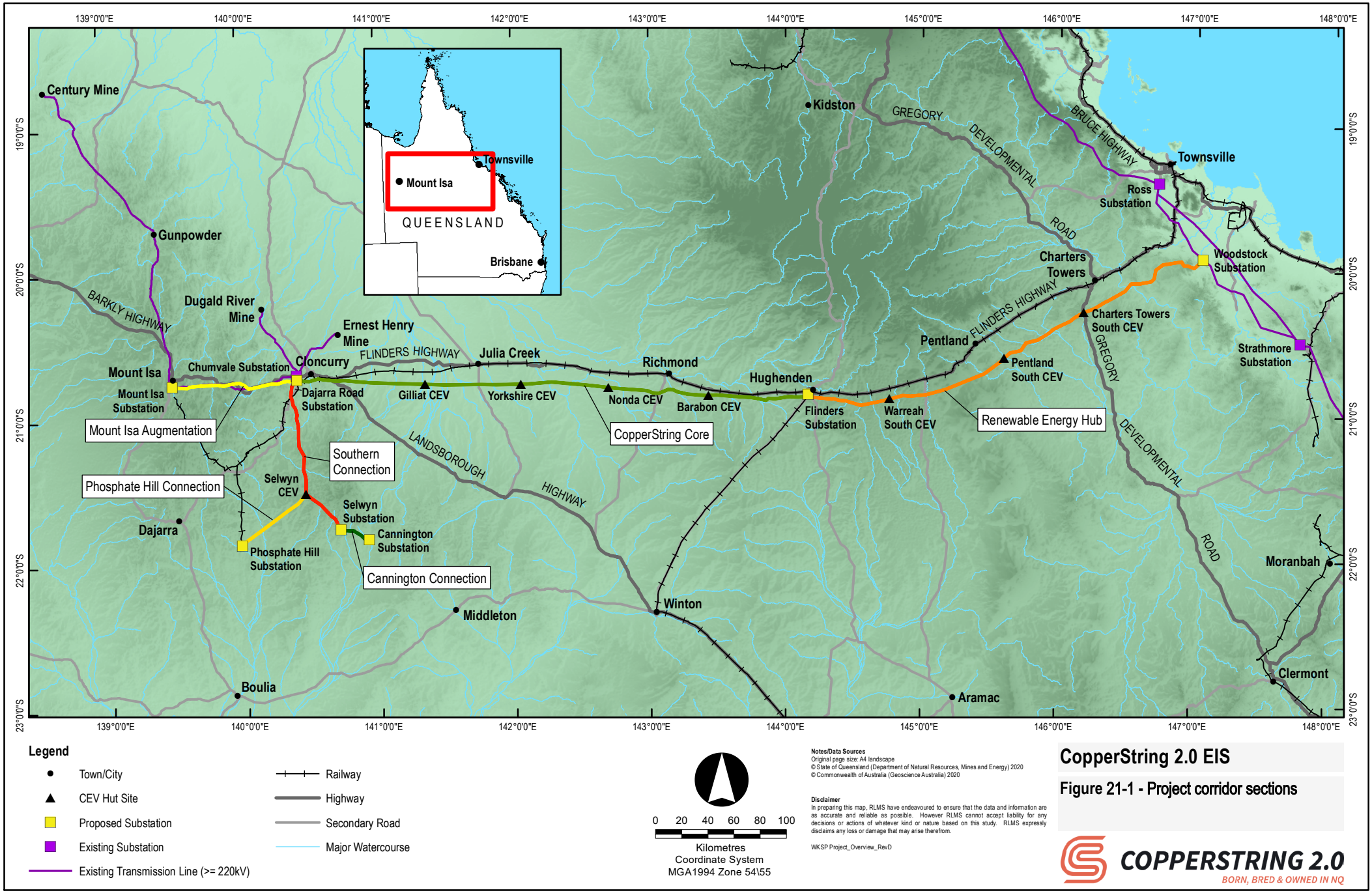
(c) details of a strategy for the staging of environmental offset/s for each Project stage (if proposed);

(d) details of appropriate offset area/s (including a map) to compensate for the residual significant impact on relevant MNES, and/or their habitat;

(e) information about the proposed offset area/s provides connectivity with other relevant habitats and biodiversity corridors which meet the ecological requirements of the protected matter; and

(f) details of the mechanism to legally secure the environmental offset/s (under Queensland legislation or equivalent) to provide protection for the offset area/s against development incompatible with conservation.





Legend

- Town/City
- CEV Hut Site
- Proposed Substation
- Existing Substation
- Existing Transmission Line (>= 220kV)
- Railway
- Highway
- Secondary Road
- Major Watercourse

0 20 40 60 80 100

Kilometres

Coordinate System
MGA1994 Zone 54\55

Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020

Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

WKSP Project_Overview_RevD

CopperString 2.0 EIS

Figure 21-1 - Project corridor sections

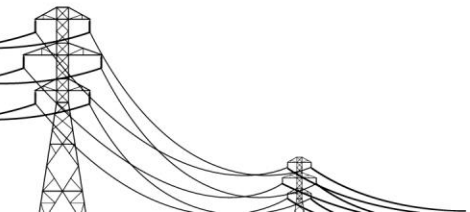
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ

21.1.5 Defined terms

In order to maintain consistency across all aspects of the Project, the terminology used is presented in Table 21-1.

Table 21-1 Project specific terminology

Term	Definition
Corridor selection	The baseline investigation corridor of the transmission line (a nominal 1,060 km long corridor). The corridor selection is 120 m wide from Woodstock to Dajarra Road, and 60 m wide from Dajarra Road to Mount Isa, Dajarra Road to Selwyn and Phosphate Hill, and Selwyn to Cannington. The 4 km long section of the corridor selection from Dajarra Road Substation to Chumvale Substation is 60 m wide and a 3 km long section from Dajarra Road Substation to the Dugald River 220 kV overhead line is 80 m wide.
Corridor section	The baseline corridor selection has been split into eight smaller portions in accordance with the proposed construction zone staging. The eight corridor sections are: • Renewable Energy Hub • CopperString Core • Mount Isa Augmentation • Southern Connection • Cannington Connection • Phosphate Hill Connection • (Optional) Kennedy Connection (not part of EIS scope)
(a) KP 50WD (b) KP 50DM (c) KP 50DS (d) KP 50SC (e) KP 50SP	Locations on the transmission lines are identified using a kilometre post (KP) system- each marking is 1 km apart, starting from east to west and north to south. The KP system corresponds to the corridor sections, some of which are combined (e.g. KP 50) on: • WD: Woodstock to Dajarra Road • DM: Dajarra Road to Mount Isa • DS: Dajarra Road to Selwyn Substation • SC: Selwyn Substation to Cannington • SP: Selwyn Substation to Phosphate Hill
Study area	The study area refers to the 5 km corridor which was subject to the field and desktop assessments (2.5 km either side of the corridor selection).
Project area	The 60 m wide easement and known infrastructure locations (including substations, CEV huts, on-easement access tracks, on-easement brake and winch sites). Other associated infrastructure of currently unknown locations have not been factored into the Project area impact calculations (these include off-easement components of lay downs, construction camp, access and occasional brake and winch sites at large bends).



Term	Definition
Towers	The transmission line support masts will typically be between 400 m and 500 m apart.
Substation	The transmission line will connect from a new substation at Woodstock and connect to substations at Flinders (Hughenden), Dajarra (Cloncurry), Selwyn, Phosphate Hill and Cannington.
CEV huts	The Controlled Environment Vault (CEV) huts contain necessary equipment for the transmission line communication system and amplify the optical signal carried.
Access track	Access tracks will be constructed to connect State and local government roads and laydown areas to the transmission line for construction and maintenance purposes.
Laydown area	Equipment and materials required for the transmission line construction will be delivered from Townsville to the regional laydown areas to be unpacked, sorted, etc.
NWMP	The Project involves the development of a high voltage transmission line to connect electricity users in the North West Minerals Province (NWMP) and the Mount Isa region to the NEM at Woodstock near Townsville.
NWPS	The existing electricity infrastructure from Cloncurry to Mount Isa is the North West Power System. This supplies electricity to consumers in the NWMP and Mount Isa region and is supplied by generators at Mica Creek (Mount Isa) and Diamantina.

21.1.6 Legislative context and standards

A review of offset policies and guidelines has been carried out to confirm those that are relevant and applicable to the Project. These are outlined in the following sections.

Commonwealth legislation

Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the Commonwealth government's principal piece of environmental legislation. The purpose of the EPBC Act Environmental Offsets Policy (the Policy) is to outline the Australian Government's position on the use of environmental offsets to compensate for adverse impacts on MNES protected under the EPBC Act. Offsets seek to provide a conservation gain through both direct and indirect targeted actions.

The EPBC Act relates to nine MNES:

- World heritage properties
- National heritage properties
- Wetlands of international importance
- Nationally threatened species and ecological communities
- Migratory species
- Commonwealth marine parks
- The Great barrier Reef Marine Park

- Nuclear actions
- A water resource, in relation to coal seam gas development and large coal mining development.

The EPBC Act is administered by the Commonwealth Department of Agriculture, Water and the Environment (DAWE).

EPBC Act Environmental Offsets Policy

The Policy provides guidance on the role of offsets in environmental impact assessments. The Policy related to all protected matters under the EPBC Act and has five key aims (as stated in the Policy):

- "To ensure the efficient, effective, timely, transparent, proportionate, scientifically robust and reasonable use of offsets under the EPBC Act;
- To provide proponents, the community and other stakeholders with greater certainty and guidance on how offsets are determined and when they may be considered under the EPBC Act;
- To deliver improved environmental outcomes by consistently apply the policy;
- To outline the appropriate nature and scale of offsets and how they are determined; and
- To provide guidance on acceptable delivery mechanisms for offsets."

There are eight overarching Offset Principles within the Policy that must be applied in determining the suitability of offsets.

Where SRIs are identified, the EPBC Act Offsets Assessment Guide is utilised through a tool developed by DAWE to assist proponents with estimating offset requirements. The Offset Assessment Guide has been developed to accompany the Policy and to give effect to its requirements. The guide is an excel spreadsheet that works on the principle of:

Impact + Offset = Improvement or maintenance of protected matter

Offsets required for relevant MNES are quantified through this process. The Policy requires at least 90% of the offset obligation to be delivered through proponent-driven, direct (land-based) offsets. The Policy allows up to 10% of the offset obligation to be delivered through other compensatory measures, such as education or research.

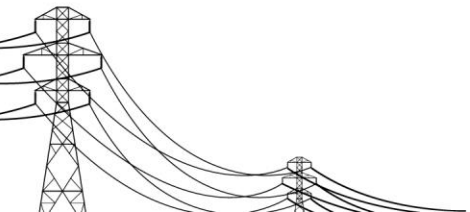
State legislation

On 1 July 2014, the current environmental offsets framework was first introduced in Queensland, consisting of the *Environmental Offsets Act 2014* (EO Act), Environmental Offsets Regulation 2014 (EO Regulation) and the Queensland Environmental Offsets Policy (the Qld Policy) (Version 1.8). State government offsets requirements of the Project impacts to MSES have been assessed against the current framework.

Environmental Offsets Act 2014

The key purpose of the EO Act is to counterbalance the SRIs of particular activities on prescribed environmental matters through the use of environmental offsets.

Under the EO Act, an administering agency may impose an offset condition on an authority if a prescribed activity will, or is likely to, have a SRI on a prescribed environmental matter and all reasonable on-site mitigation measures for the prescribed activity have been, or will be, undertaken.



Under s8 of the EO Act, a SRI is generally defined as “an adverse impact, whether direct or indirect, of a prescribed activity on all or part of a prescribed environmental matter that remains, or is likely to remain (whether temporarily or permanently) despite on-site mitigation measures for the prescribed activity, and is, or will or is likely to be, significant”.

Under s9 of the EO Act, a prescribed activity is defined as “an activity the subject of an authority under another Act, and for which an offset condition may be imposed under the other Act on the authority, and that is prescribed under a regulation”. Prescribed activities are listed in Schedule 1 of the EO Regulation (and are provided in the next section).

A prescribed environmental matter is any of the following:

- A MNES as defined under the EPBC Act
- A MSES as identified in the EO Regulation
- A matter of local environmental significance (MLES) as identified by a local planning instrument

S11 of the EO Act states that a conservation outcome is achieved by the environmental offset if the offset is selected, designed and managed to maintain the viability of the matter.

It is noted that under s15 of the EO Act, the State cannot impose an offset condition in relation to a prescribed activity, if a Commonwealth decision has already been made in relation to the same, or substantially the same activity, prescribed environmental matter and area of impact. As such, offsets imposed as a condition as part of the Commonwealth approval will be taken to be offsets under the State approval. Having regard to this, the offsets proposal presented in this chapter has been developed to address MNES as Commonwealth matters and any remaining MSES as State matters.

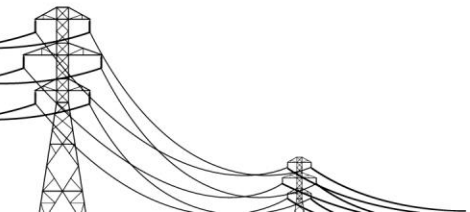
S18 of the EO Act provides for a proponent to elect to deliver an offset under the EO Act by three methods:

- Proponent-driven offset
- Financial settlement offset
- Combination of proponent-driven and financial settlement offsets

Environmental Offsets Regulation 2014

The EO Regulation provides details of the prescribed activities regulated under existing legislation and prescribed environmental matters to which the EO Act applies. Prescribed activities under s9 of the EO Act are listed under Schedule 1 of the EO Regulation and include:

- A resource activity carried out under an environmental authority
- A prescribed environmentally relevant activity (ERA) under the *Environmental Protection Act 1994* (EP Act)
- The carrying out of works in a marine park (authorised under the *Marine Parks Act 2004*)
- An activity conducted under an authority in a protected area under the *Nature Conservation Act 1992* (NC Act) s34, s35, s38, s42AD or s42AE, 43F, 43G or 43H
- Taking a protected plant under a clearing permit under the NC Act, in an area outside a protected area
- Development for which an environmental offset may be required under the following State Codes of the State development assessment provisions:



  - State Code 8: Coastal development and tidal works
  - State Code 9: Great Barrier Reef wetland protection areas
  - State Code 11: Removal, destruction or damage of marine plants
  - State Code 12: Development in a declared fish habitat
  - State Code 16: Native vegetation clearing
  - State Code 18: Constructing or raising waterway barrier works in fish habitats
  - State Code 22: Environmentally relevant activities
  - State Code 25: Development in South East Queensland koala habitat areas
- Development for which an environmental offset may be required under a local planning instrument

Prescribed environmental MSES are described in Schedule 2 of the EO Regulation and include:

- Regulated vegetation
- Connectivity areas
- Wetlands and watercourses
- Designated precinct in a strategic environmental areas
- Protected wildlife habitat
- Protected areas
- Highly protected zones of State marine parks
- Fish habitat areas
- Waterway providing for fish passage
- Marine plants
- Legally secured offset areas

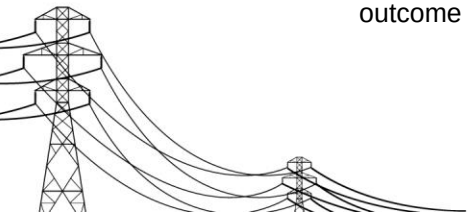
Queensland Environmental Offsets Policy

The Qld Policy provides a single, streamlined, whole-of-government policy for environmental related offsets in Queensland. The purpose of the policy is to provide a decision-support tool to enable consistent assessment by administering agencies of offset proposals provided by authority holders to satisfy offset conditions.

Under s14 of the EO Act, offsets can only be required if residual impacts constitute a SRI as defined under s8 of the EO Act. The Commonwealth Matters of National Environmental Significance: Significant Impact Guidelines 1.1 (DoE 2013) and the Queensland Environmental Offsets Policy Significant Residual Impact Guideline (DEHP 2014) have been adopted for the assessment of the significance of residual impacts of the Project on MNES and/or MSES, as applicable.

The policy states that an environmental offset must meet the following seven offset principles:

- Offsets will not replace or undermine existing environmental standards or regulatory requirements, or be used to allow development in areas otherwise prohibited through legislation or policy
- Environmental impacts must first be avoided, then minimised, before considering the use of offsets for any remaining impact
- Offsets must achieve a conservation outcome that achieves an equivalent environmental outcome



- Offsets must provide environmental values as similar as possible to those being lost
- Offset provision must minimise the time-lag between the impact and delivery of the offset
- Offsets must provide additional protection to environmental values at risk, or additional management actions to improve environmental values
- Where legal security is required, offsets must be legally secured for the duration of the impact on the prescribed environmental matter.

The policy provides that a proponent-driven offset may comprise a land-based offset, actions in a Direct Benefit Management Plan (DBMP), or a combination of both, delivered through an offset delivery plan. The suitability of an offset site compared to an impact site must be assessed using the methods in the Guide to determining terrestrial habitat quality (current Version 1.3). Proponent-driven offsets must be legally secured.

A proposed financial settlement offset may use the financial settlement offset calculator on the Department of Environment and Science (DES) website to calculate the financial payment required.

The Queensland Environmental Offsets Policy General Guide (Version 1.2) (DEHP, 2017) further describes the prescribed environmental matters that may be subject to offset requirements for each type of prescribed activity.

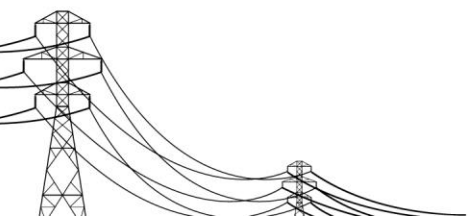
Local planning schemes

Local governments may impose an offset condition if there is a SRI on a MLES, and be specified in the local government planning scheme.

The following local government areas are intersected by the Project:

- Burdekin Shire Council
- Charters Towers Regional Council
- Flinders Shire Council
- Richmond Shire Council
- McKinlay Shire Council
- Cloncurry Shire Council
- Mt Isa Council

There are no MLES or offset requirements triggered under the local planning schemes for these council areas.



21.2 Method

In order to achieve the objectives and purpose of this chapter, the following overarching tasks have been undertaken (which are described in the following sections):

- Identification of offset policies of relevance to the Project (refer to Section 21.1.5)
- Identification of MNES and MSES that are confirmed present or considered likely to occur within the Project area
- Identification of prescribed activities and/or quantification of impacts for each MNES and MSES known or considered likely to occur
- SRI assessment for relevant MNES and MSES
- Identification of potential offset obligations for those which the Project is anticipated to have a SRI
- High-level identification of strategies available for potential delivery of offsets, including discussion of proponent-driven (land-based) and financial settlement approaches.

21.2.1 Identification of relevant MNES and MSES

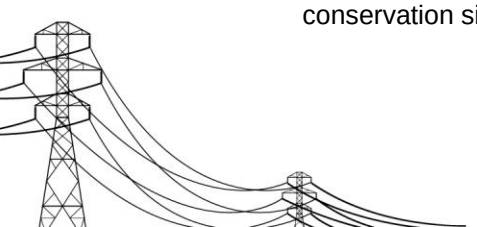
A structured approach was adopted to comprehensively identify MNES and MSES relevant to the Project. This included the following:

- Review of the CopperString 1.0 EIS (2010) and Supplementary EIS (2011 SEIS) reports and mapping data
- Desktop assessment of government databases and mapping layers including a Protected Matters Search Tool (PMST) report, MSES report and other available desktop ecological resources, including Queensland Globe, with the following mapping and layers specifically targeted:
  - Regulated vegetation management map and regional ecosystem mapping (Version 11)
  - Essential habitat (Version 7.2)
  - Protected plants flora survey trigger areas
  - Queensland Wetlands Mapping (Version 5.0)
  - Other MSES layers for conservation areas, wetlands, watercourses, vegetation and wildlife habitat
- Information from species likelihood of occurrence assessment, as detailed in Volume 3 Appendix N Ecological Assessment
- Targeted field survey results undertaken by GHD in 2019 and 2020, as detailed in Volume 3 Appendix N Ecological Assessment
- Predictive habitat mapping for species of conservation significance, as detailed in Volume 3 Appendix N Ecological Assessment.

These are described in the existing environment (Section 21.3).

21.2.2 Identification of prescribed activities and impact areas

The quantification of impact areas for MNES and MSES has been undertaken using GIS mapping layers and predictive habitat mapping for species of conservation significance that intersect the Project area. Predictive habitat mapping was undertaken as part of the GHD ecological assessment (refer to Volume 3 Appendix N Ecological Assessment) for all species of conservation significance that were confirmed present or considered likely to occur.



Suitable habitat shown on predictive habitat mapping has been defined as indicative areas of suitable mapped characteristics (based largely on essential habitat factors but also on key characteristics such as proximity to waterways) within the present distribution of the species. Specific criteria for predictive habitat mapping are provided in Volume 3 Appendix N Ecological Assessment.

This habitat mapping has been considered for assessing potential impacts to each species, as relevant to their habitat requirements (e.g. non-breeding, breeding or foraging habitat), movements and lifecycle, and in relation to remaining suitable habitat available at the local and regional scales. Suitable habitat mapped does not indicate the area of habitat critical to survival of a species or the area of important habitat for a species, unless stated for that species.

Identification of prescribed activities that trigger significant impact assessment of particular prescribed environmental matters has been provided. For the identified prescribed activities, the relevant prescribed environmental matters that are required to be assessed have been indicated with reference to the Queensland Environmental Offsets Policy General Guide (Version 1.2) (DEHP 2017).

21.2.3 Significant residual impact assessment

A SRI assessment has been undertaken for MNES and MSES that have been confirmed present or likely to occur, and potentially be impacted within the Project area. The guidelines for impact assessment relevant to the Project are provided below.

The results of significant impact assessments undertaken for identified conservation significant flora and fauna species, in accordance with relevant MNES and MSES impact assessment methods below, are detailed in Volume 3 Appendix N Ecological Assessment and have been summarised in Section 21.5.

MNES impact guidelines

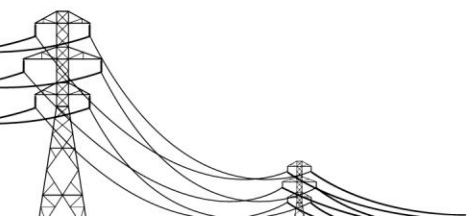
Project relevant MNES have been identified and assessed for significant impact in Volume 3 Appendix N Ecological Assessment. For MNES species listed under the EPBC Act, assessment has been made using the criteria of the following guidelines, as applicable:

- EPBC Significant Impact Guidelines 1.1
- EPBC Act referral guidelines for the vulnerable koala
- Significant impact guidelines for the Endangered black-throated finch (southern) (*Poephila cincta cincta*)
- EPBC Act draft referral guidelines for the nationally listed Brigalow Belt reptiles
- Draft referral guideline for 14 birds listed as migratory species under the EPBC Act

MSES impact guidelines

Project relevant MSES have been identified and assessed for significant impact in Volume 3 Appendix N Ecological Assessment. For species MSES, assessment has been made using the criteria of the following guidelines, as applicable:

- Queensland Significant Residual Impact Guideline (DEHP 2014) for applications made under the EP Act, NC Act and *Marine Parks Act 2004*.
- Queensland Significant Residual Impact Guidelines (DSDIP 2014) for applications made under the *Planning Act 2016.*

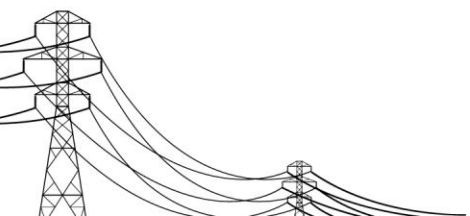


21.2.4 Potential offset obligations

Where significant impacts to MNES or MSES have been identified and quantified, the EPBC Act Offsets Assessment Guide or Queensland offset delivery calculators have been utilised, respectively, to provide an indication of potential offset obligations. Where SRI for a prescribed activity has been identified, the Impact Site Assessment Tool will be utilised, which includes both financial settlement and site assessment options, to calculate MSES offset requirements.

21.2.5 Offset delivery approach

A high-level approach to delivery of offsets for significantly impacted MNES and MSES has been provided with identification of some potential offset areas, preferred legally securing mechanism, and further assessments required.



21.3 Existing environment

This section summarises the existing MNES and MSES that have been confirmed present or are considered likely to occur within the Project area.

21.3.1 MNES

Table 21-2 shows a summary of MNES relevant to the Project, based on results of the PMST reports, desktop databases and mapping, and ecological desktop and field assessments undertaken for the Project area.

Further detail and maps of relevant MNES areas and species habitat map are presented in Volume 3 Appendix N Ecological Assessment.

21.3.2 MSES

Table 21-3 shows a summary of prescribed environmental matters that are MSES relevant to the Project, based on results of the MSES report, desktop databases and mapping, ecological desktop and field assessments undertaken for the Project area.

Mapped MSES areas are shown on Figure 21-2.

Further detail and maps of relevant MSES areas and species habitat maps are presented in Volume 3 Appendix N Ecological Assessment.

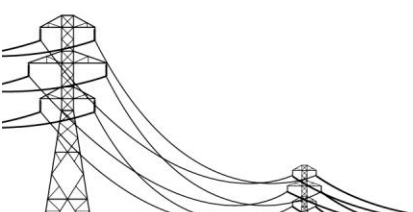
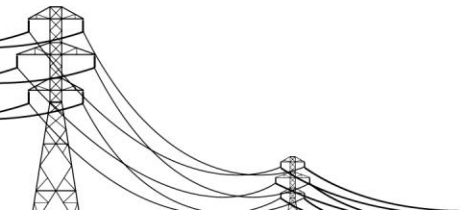


Table 21-2 Summary of matters of National environmental significance

MNES value	Trigger	Presence	Impact
World heritage properties	A declared Word Heritage Property is an area that has been included in the World Heritage List or declared by the Minister to be a World Heritage Property.	No world heritage properties are intersected by the Project area or occur directly adjacent to the Project area. The Great Barrier Reef World Heritage Area (GBR WHA) is located more than 45 km downstream of the proposed corridor selection (at the eastern-most part of the Project area). Two catchments intersected by the Project flow into the GBR WHA, being: • One main tributary of the Haughton River is intersected by the corridor selection within the eastern-most Project area, which flow into the GBR WHA, being Oaky Creek. The watercourse is contained within the Renewable Energy Hub corridor section. Oaky Creek (A) is intersected by the corridor selection at KP 6WD. Oaky Creek is a tributary in the upper reaches of the Haughton River catchment, which drains to the GBR WHA more than 45 km east of the Project. • Numerous waterways within the Burdekin River catchment are intersected by the Project area, including the Burdekin River and tributaries of Oaky Creek, Pandanus Creek, and tributaries and the main channels of the Campaspe River and Cape River, west until KP 230WD within the Renewable Energy Hub corridor section. These waterways flow into the Burdekin Dam and then into the GBR WHA over 100 km downstream. It is unlikely that the Project will result in direct or indirect impacts to the GBR WHA, due to the nature of the works and the distance from the area.	Unlikely

MNES value	Trigger	Presence	Impact
National heritage properties	Under the EPBC Act the National Heritage List includes natural, historic and Indigenous places of outstanding heritage value to the nation.	No national heritage properties are intersected by the Project area or occur directly adjacent to the Project area. As described in world heritage properties (refer to above), the Great Barrier Reef (GBR) is also a national heritage property, which is located approximately 45 km downstream of the proposed corridor selection. It is unlikely that the Project will result in direct or indirect impacts to the GBR natural, historic or indigenous heritage values, due to the nature of the works and distance to this area.	Unlikely
Wetlands of international importance	The EPBC Act enhances the management and protection of Australia's wetlands of international importance (Ramsar wetlands). A 'declared Ramsar wetland' is an area that has been designated under Article 2 of the Ramsar Convention or declared by the Minster to be a declared Ramsar wetland under the EPBC Act.	No wetlands of international importance (Ramsar wetlands) are intersected by the Project area or occur directly adjacent to the Project area. The closest Ramsar wetland to the proposed corridor selection is the Bowling Green Bay Ramsar site, which is located over 40 km northeast of the eastern-most part of the Project area. The Haughton River catchment, which intersects the Project within the Renewable Energy Hub corridor section in its upper reaches at KP 7WD and KP 11WD, eventually drains to this Ramsar wetland. It is unlikely that the Project will result in direct or indirect impacts to the ecological character of the Bowling Green Bay Ramsar site, due to the nature of the works and distance to this area. The Coongie Lakes wetlands were also identified in desktop searches. This wetland is located in South Australia. Although the CopperString Core section is located 700 – 800 km upstream of the wetland, some of the watercourses within the section (Towerhill Creek) flow downstream and into the Coongie Lakes Ramsar site. It is unlikely that the Project will result in direct or indirect impacts to these Ramsar wetlands.	Unlikely

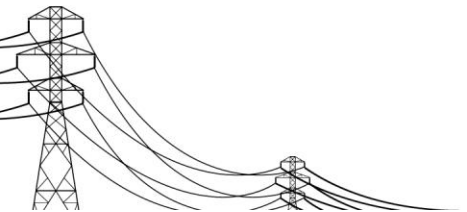


Nationally threatened species and ecological communities	Threatened ecological communities (TECs) that are listed on the Species Profile and Threats Database (SPRAT) as: • Critically Endangered • Endangered	One TEC was identified by the PMST search as having the potential to occur within the Project area: • The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin (Endangered under the EPBC Act) This TEC was predicted to occur in the CopperString Core section of the corridor selection. None of the regional ecosystems (REs) listed as aligning with this TEC (RE 2.3.39, 4.3.22, 5.3.23, 6.3.23, 10.3.31 and 11.3.22) are mapped as occurring within the corridor selection. Therefore this TEC is not considered likely to occur and will not be impacted by the Project. While not indicated in the PMST searches, previous surveys reported in the 2011 SEIS identified the following TEC within the study area: • Semi-evergreen vine thickets (SEVT) of the Brigalow Belt (North and South) and Nandewar Bioregions (Endangered under the EPBC Act) This TEC was recorded 200 m south of the 2010/2011 corridor between KP 68WD and 71WD, with additional small patches identified that were directly intersected by the 2010/2011 corridor at KP 71WD. These areas have been avoided by the current, realigned Project corridor selection. No REs listed as comprising this TEC (being RE 11.2.3, 11.3.11, 11.4.1, 11.5.15, 11.8.3, 11.8.6, 11.8.13, 11.9.4, 11.9.8, 11.11.18 and 11.7.1x1) are mapped as occurring within the Project area. A significant impact assessment was undertaken for this TEC as it was confirmed present, however it has been avoided by the Project area and will not be directly or indirectly impacted by the Project. No Brigalow (*Acacia harpophylla* dominant and co-dominant) TEC is mapped or has been previously identified during field verification surveys within the study area. No REs considered to be analogous to this TEC (being RE 6.4.2, 11.3.1, 11.4.3, 11.4.7, 11.4.8, 11.4.9, 11.4.10, 11.5.16, 11.9.1, 11.9.5, 11.9.6, 11.11.14, 11.12.21, 12.8.23, 12.9-10.6, 12.12.26) have been mapped within the study area. Therefore this TEC is not considered likely to occur and will not be impacted by the Project.	Unlikely

MNES value	Trigger	Presence	Impact
		No natural grasslands of the Queensland Central Highlands and northern Fitzroy Basin TEC (Endangered under the EPBC Act) have been previously identified or mapped within the study area. No regional ecosystems considered to be analogous to this TEC (RE 11.3.21, 11.4.4, 11.4.11, 11.8.11, 11.9.3, 11.9.12, 11.11.17) are mapped within the corridor selection (DoEE, 2019a). Therefore this TEC is not considered likely to occur and will not be impacted by the Project.	
	Critically Endangered, Endangered and Vulnerable flora and fauna species listed under the EPBC Act	A total of 15 flora and fauna species listed under the provisions of the EPBC Act are confirmed present or are considered likely to occur within the Project area (GHD, 2020), including: Flora • *Eucalyptus raveretiana* (black ironbox) • *Livistona lanuginosa* (waxy cabbage palm) • *Acacia crombiei* (pink gidgee) Fauna • *Geophaps scripta scripta* (squatter pigeon (southern)) • *Phascolarctos cinereus* (koala) • *Poephila cincta cincta* (southern black-throated finch) • *Sminthopsis douglasi* (Julia Creek dunnart) • *Hirundapus caudacutus* (white-throated needletail) (also a listed migratory species) • *Falco hypoleucos* (grey falcon) • *Erythrotriorchis radiatus* (red goshawk) • *Pezoporus occidentalis* (night parrot)	Potential

MNES value	Trigger	Presence	Impact
		• *Grantiella picta* (painted honeyeater) • *Rostratula australis* (Australian painted-snipe) • *Acanthophis hawkei* (plains death adder) • *Denisonia maculata* (ornamental snake)	
Migratory species	The list of migratory species established under s209 of the EPBC Act comprises native migratory species which are identified in: • The Bonn Conservation (Convention on the Conservation of Migratory Species of Wild Animals Appendices I and II) • The Japan-Australia Migratory Bird Agreement and the China-Australia Migratory Bird Agreement • An international agreement approved by the Minister, such as the Republic of Korea-	A total of nine migratory species listed under the provisions of the EPBC Act are confirmed present or likely to occur within the Project area (GHD, 2020) including: • *Apus pacificus* (fork-tailed swift) • *Gallinago hardwickii* (Latham's snipe) • *Gelochelidon nilotica* (gull-billed tern) • *Glareola maldivarum* (oriental pratincole) • *Hirundapus caudacutus* (white-throated needletail) (also a listed threatened species) • *Hydroprogne caspia* (Caspian tern) • *Plegadis falcinellus* (Glossy ibis) • *Tringa glareola (*wood sandpiper) • *Tringa stagnatilis* (marsh sandpiper)	Potential

MNES value	Trigger	Presence	Impact
	Australia Migratory Bird Agreement.		
Commonwealth marine areas	Any part of the sea, including waters, seabed, and airspace within Australia's exclusive economic zone and/ or over the continental shelf of Australia, that is not State or Northern Territory waters.	The Project is not located within any Commonwealth marine areas.	N/A
The Great Barrier Reef Marine Park	The Great Barrier Reef Marine Park, stretched along the coast of Queensland, is approximately 345,000 km^2. Since 25 November 2009, the Great Barrier Reef Marine Park has been recognised as a MNES, protected under the EPBC Act.	The Great Barrier Reef Marine Park is not intersected by the Project and is not directly adjacent to the Project area. As described in world heritage properties and national heritage properties, the Great Barrier Reef Marine Park (GBRMP) is located approximately 45 km downstream of the proposed corridor selection. The Haughton River catchment, which intersects the Project within the Renewable Energy Hub corridor section in its upper reaches at KP 7WD and KP 11WD, drains to the GBRMP. The Burdekin River catchment also drains to the GBRMP further south, more than 100 km downstream of the Burdekin Dam. It is unlikely that the Project will result in direct or indirect impacts to the GBRMP environment, due to the nature of the works and distance to this area.	Unlikely
Nuclear actions	The EPBC Act recognises the protection of the environment from nuclear actions as a MNES.	The Project does not involve any nuclear actions.	N/A



MNES value	Trigger	Presence	Impact
A water resource, in relation to coal seam gas development and large coal mining development	Water resources are a MNES in relation to coal seam gas and large coal mining development. Actions involving exploration, appraisal and pilot developments may be captured by the definition where they involve extraction of gas or coal.	The Project is not a coal seam gas development or large mining development.	N/A

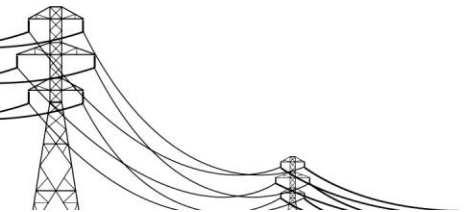
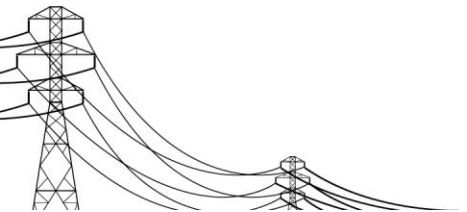


Table 21-3 Summary of prescribed environmental matters of State environmental significance

MSES category	Trigger	Presence	Impact
Regulated vegetation	A prescribed RE that is an Endangered or Of Concern RE, as defined under the *Vegetation Management Act 1999* (VM Act)	No Endangered RE will be impacted by the Project. Two Category B Of Concern REs are located within the Project area, consisting of five homogenous or heterogeneous polygons of RE 1.11.7, and one heterogeneous polygon of RE 2.3.43. The heterogeneous polygons contain one component RE that has an assigned status of Of Concern under the VM Act, mapped as comprising less than 10% of the overall polygon. Descriptions of the Of Concern REs are: • 1.11.7 *Acacia cambagei* low woodland on metamorphic hills (mapped as a single RE, or as a sub-dominant RE in heterogeneous units with one or more of the following component REs: 1.11.2a, 1.11.3a and 1.5.4d in CopperString Core, Mount Isa Augmentation, Southern Connection and Phosphate Hill Connection corridor sections) • 2.3.43 *Sporobolus mitchellii +/- Cyperus bifax, Astrebla elymoides, Chenopodium auricomum* tussock grassland on seasonally inundated alluvial plains and drainage depressions (mapped as a sub-dominant RE in one heterogeneous polygon with 2.3.17a, 2.3.7a and 2.3.3 in CopperString Core corridor section) The Of Concern RE 1.11.7 is a low, sparse woodland on hills and ranges, often comprising only minor components of heterogeneous polygons (representing only 5 or 10% of the heterogeneous polygon), of which much of the low canopy vegetation can be spanned across and potentially avoided with appropriate siting of towers and span lengths. As such, no disturbance is expected to occur to Of Concern RE 1.11.7 as a result of the Project. The Of Concern RE 2.3.43 is a grassland community on alluvial plains that will require very little clearing of vegetation in order to construct the Project. Towers will be placed to avoid occurrences of the Of Concern RE 2.3.43 within the corridor, with very little clearing of vegetation required in order to construct the Project across this braided channel. The estimated disturbance area of Of Concern RE 2.3.43 (the Of Concern	Potential

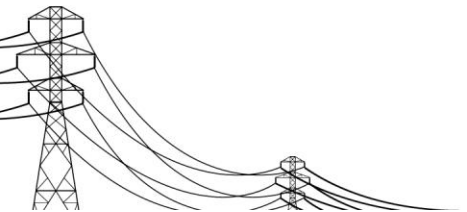
MSES category	Trigger	Presence	Impact
		component of the mixed polygon is typically 5% of the 11.26 ha overall polygon) is expected to be 0.56 ha. The total disturbance area of Of Concern RE is estimated to be a maximum of 0.56 ha.	
	A prescribed RE that intersects with an area shown as a wetland on the vegetation management wetlands map (to the extent of the intersection)	A number of regulated vegetation wetlands (REs within 100 m of a wetland) are mapped within the study area (2.5 km either side of the centreline). Regulated vegetation wetlands occur within the study area at the following locations: • Renewable Energy Hub KP: 123-124, 139-146, 173-178, 175-184, 202-205, 238-239, 255, 266-267, 269, 274-275, 306-309, and 314WD • Copperstring Core KP: 368, 401, 623, 627, 629-634, 639-641, 645-6647, 606-611, 624, 629, 631, 669, 730WD • Mount Isa Augmentation KP: 66-68DM • Cannington connection KP: 4SC • Phosphate Hill Connection KP: 12SP No MSES regulated vegetation wetlands are intersected by the Project area.	Unlikely
	A prescribed RE that is located within the defined distance from the defining banks of a watercourse (or drainage feature under the Water Act) identified on the vegetation management watercourse map	Regulated vegetation watercourses are intersected by the Project area across all corridor sections, impacting areas within the defining distance of the watercourse banks within regulated vegetation. Direct impacts to most watercourses will be avoided/spanned by the Project transmission line, and access tracks will use existing crossings. Other associated infrastructure and construction disturbance areas will not be located within the defined distance of regulated vegetation watercourses.	Potential



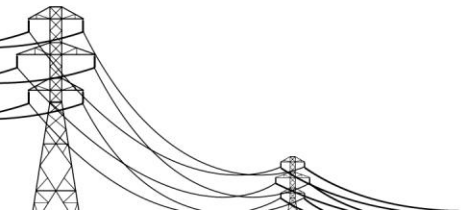
MSES category	Trigger	Presence	Impact
	A prescribed RE that is an area of essential habitat on the essential habitat map for an animal or plant that is Endangered or vulnerable wildlife. For a prescribed activity relating to an approval for State Code 16 Native vegetation clearing only, a prescribed RE that is an area of essential habitat for an animal or plant that is near threatened wildlife	There is 205.78 ha of mapped essential habitat intersected by the Project area for the following NC Act listed species: • Squatter pigeon • Ornamental snake • Julia Creek dunnart • Purple-necked rock wallaby • Waxy cabbage palm The permanent loss in any section is not expected to exceed 15% of the total corridor, which would reduce the disturbance area of essential habitat to 30.87 ha (as a maximum).	Potential
Connectivity areas	A prescribed RE (containing remnant vegetation that is required for ecosystem functioning) that is of sufficient size and configured in a way that maintains ecosystem functioning, and will remain in the landscape despite threatening processes (within the meaning of the NC Act).	The DES Landscape Fragmentation and Connectivity Tool was used to determine potential impacts on connectivity as a result of the Project. The Project area is estimated to be 6,621 ha, factoring in planned locations of the transmission line corridor, substations and CEV huts (with some infrastructure contained within these footprints, such as some access tracks and assembly areas). Of the Project area, approximately 6,333.75 ha is mapped as remnant vegetation. There is a high percentage of regional extent of remnant areas (i.e. over 91% within a 20 km buffer area is remnant). The change of areas of core remnant at the local scale (within 5 km buffer area) is low (approximately 1.79%). The number of core remnant areas pre and post-impact is the same (core polygons greater than 1 ha). The GIS analysis has determined that the impact of the Project on connectivity areas is not significant (i.e. not a significant reduction in core remnant areas at the local scale).	Unlikely

MSES category	Trigger	Presence	Impact
Wetlands and watercourses	Wetland in a GBR wetland protection area (WPA)	The Project area intersects a trigger area for a GBR WPA within the Renewable Energy Hub at KP 177WD for a distance of approximately 700 m. The high ecological significance (HES) wetland is approximately 370 m south-east of the corridor selection and is mapped as RE 10.4.7 (*Casuarina cristata* open woodland on Cainozoic lake bed). This area was visited during the GHD 2019 survey and was confirmed to contain RE 10.4.7 featuring *C. cristata* (bulloak) open forest to woodland. However, the section of trigger area that is intersecting the corridor selection at this location contains regrowth Acacia habitat. Approximately 5 ha of mapped WPA trigger area in intersected by the Project area, however the Project is unlikely to impact the wetland within the WPA and unlikely to trigger approval for high impact earthworks in a WPA due to being electricity operating works and being able to comply with Schedule 14 of the Planning Regulation 2017 (Planning Regulation). There is another area of WPA occurring at KP 180WD approximately 1 km southeast of the corridor selection, however this WPA will not be impacted by the Project.	Unlikely
	Wetland of HES shown on the map of Queensland wetland environmental values	No HES wetlands (outside of GBR areas) are intersected by the Project area.	Unlikely
	Wetland or watercourse in high ecological value waters, defined under the Environmental Protection (Water and Wetland Biodiversity) Policy 2019, Sch 2	No wetlands or watercourses of high ecological value are intersected by or mapped in proximity to the Project area.	No

MSES category	Trigger	Presence	Impact
Designated precinct in a strategic environmental area (SEA)	Areas (designated precinct) prescribed within the Regional Planning Interests Regulation 2014	No SEAs are intersected by or mapped in proximity to the Project area.	No
Protected wildlife habitat	Areas that contain plants that are Endangered or Vulnerable plants including flora survey high risk trigger areas	Approximately 12.1 ha of protected plant high risk trigger area is intersected by the Project area, for *Livistona lanuginosa* (waxy cabbage palm) between KP 136 and 140WD in the Renewable Energy Hub corridor section. There are known occurrences and potential habitat for the following NC Act listed flora species: • Waxy cabbage palm – located within Renewable Energy Hub corridor section (also MNES) (known locations at KP 124-125WD and KP 137-139WD) • *Eucalyptus nudicaulis* – located within Mount Isa Augmentation corridor section (known location at KP 89.5DM) *Acacia armitii* has Near Threatened status under the NC Act, which is not a prescribed environmental matter or MSES (unless for regulated vegetation essential habitat), therefore does not trigger offset requirements. It is proposed to avoid occurrences of individual waxy cabbage palm and *E. nudicaulis* locations, however there is potential to require a clearing permit to undertake clearing works in proximity to these plants. Therefore a SRI assessment has been done to assess the potential for impacts to trigger offset requirements.	Potential
	Koala habitat area	No koala habitat areas are mapped in the vicinity of the Project area.	No

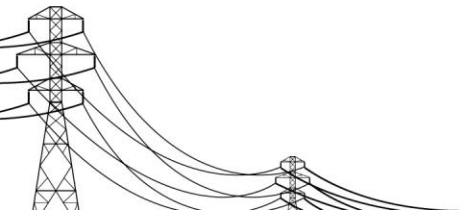


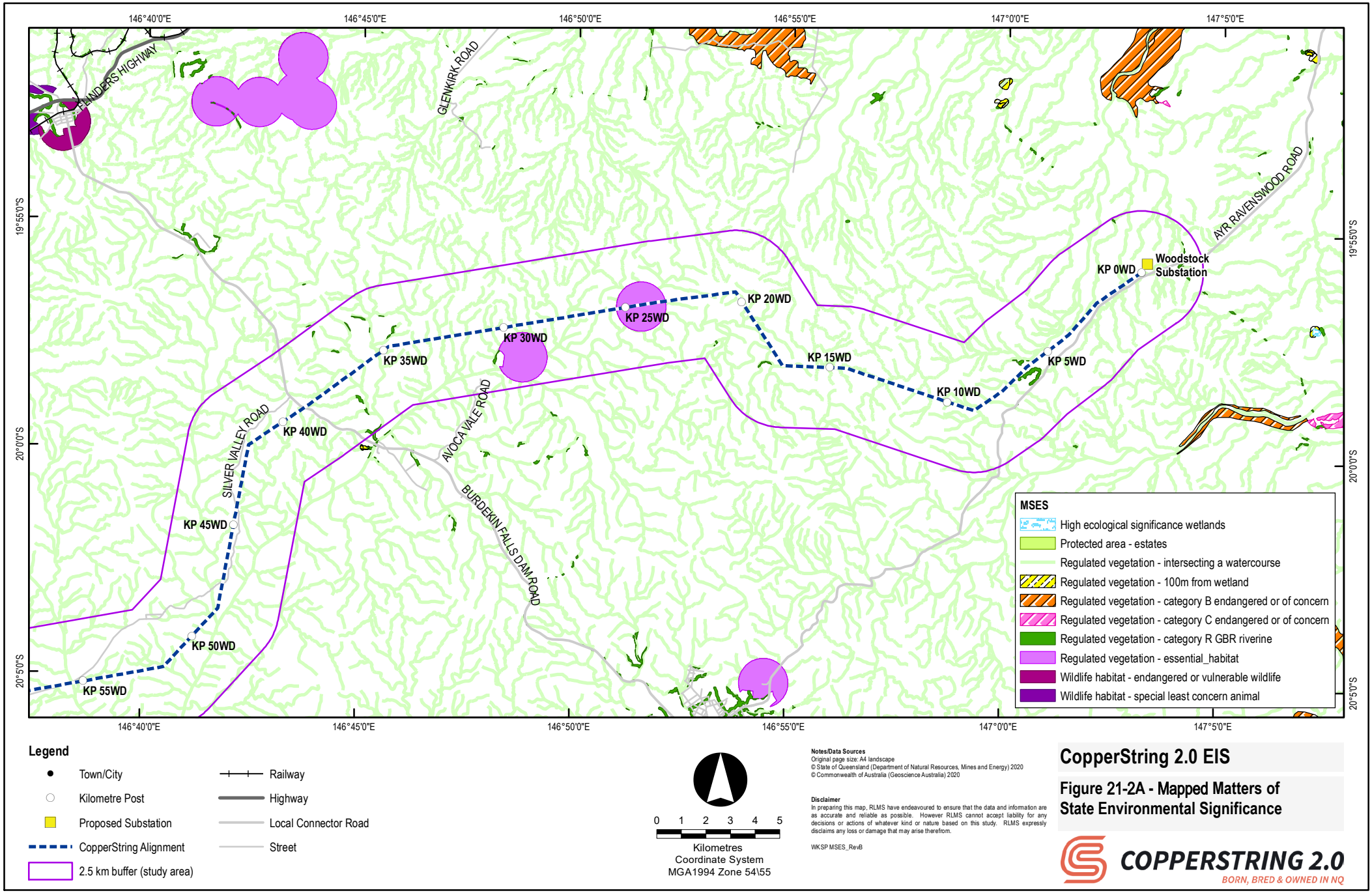
MSES category	Trigger	Presence	Impact
	Habitat for an animal that is Endangered, Vulnerable or Special Least Concern (where habitat may be an area of land used by an animal for foraging, roosting, nesting or breeding)	Wildlife habitat (some of which is also mapped as essential habitat, and some of which is not associated with a known previous record) is mapped within the Project area: • Ornamental snake KP 151, 172-175, 168-176WD • Squatter pigeon KP 24, 29, 135, 139, 149, 152, 174, 201, 213, 226, 241, 245, 274, 280, 296-297WD • Special least concern animal KP 201-203WD • Special least concern animal KP 247-249WD • Endangered or Vulnerable species KP 295-298WD • Julia Creek dunnart at KP 596, 624WD • Endangered or Vulnerable species (likely purple-necked rock wallaby) at KP 18-21DM, 29-31DM, 33-35DM, 35-42DM, 47-49DM, and KP 13-15DS, 60-63DS, 128DC-11DS, 4-7SC • Special least concern animal at KP 78-80DS • Special least concern animal at KP 66-68DM There is suitable habitat for NC Act listed fauna species that are Endangered, Vulnerable or Special Least Concern status that has been mapped (using predictive habitat mapping) within the Project area. Pre-clearance surveys within suitable habitat areas will be undertaken to inform tower siting and heights with the aim of avoiding important habitat areas for these species, such as breeding habitat or wetland/gilgai habitats.	Potential

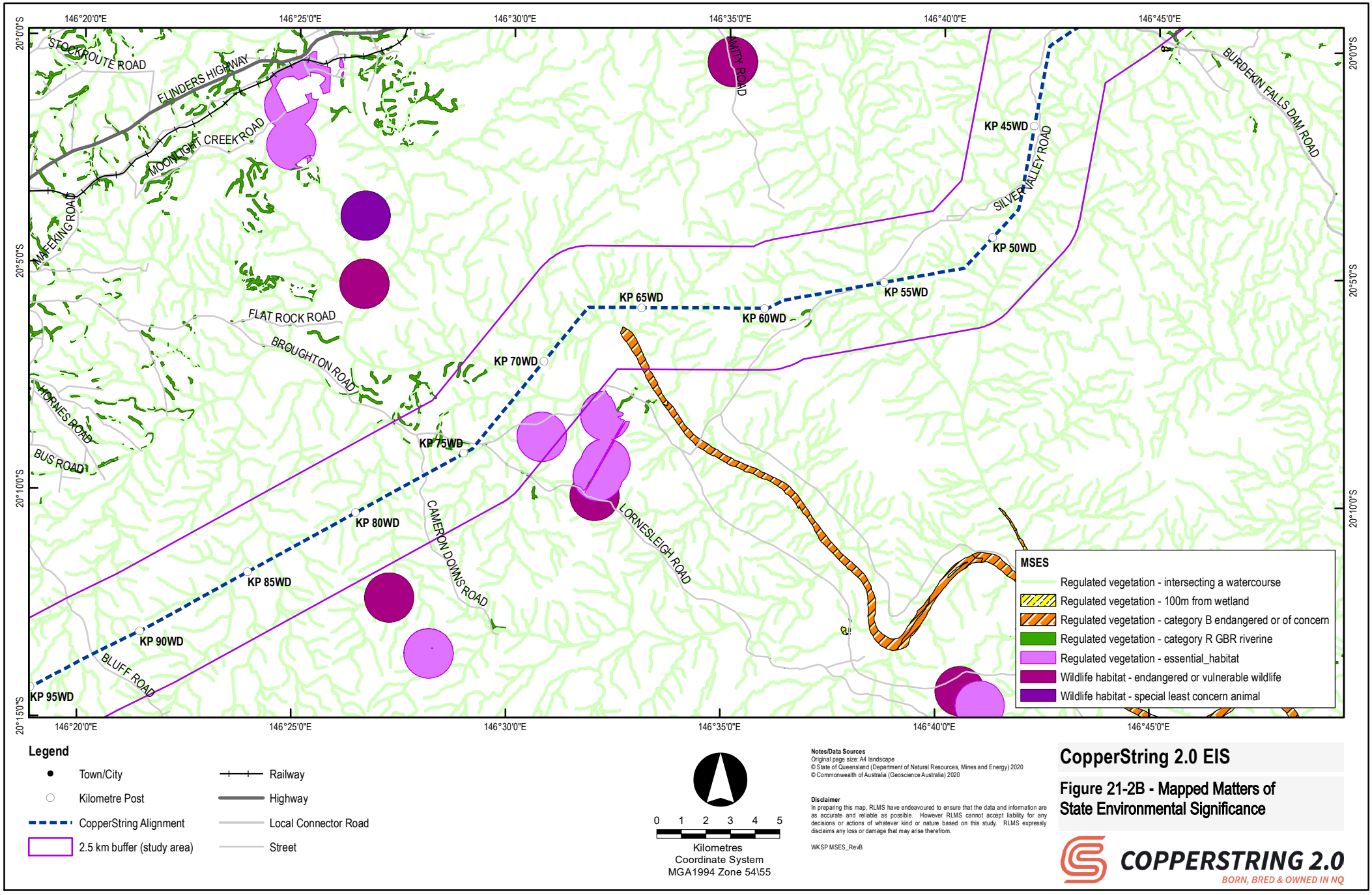


MSES category	Trigger	Presence	Impact
Protected areas	The following protected areas declared under the NC Act: • National parks • National parks (Aboriginal land) • National parks (Torres Strait Islander land) • National parks (Cape York Peninsular Aboriginal land) • Regional parks • Nature refuges	The Project intersects approximately 192.0 ha of the Ballara Nature Refuge, a protected area under the NC Act. The Ballara Nature Refuge encompasses part of Lot 427 SW505054 and Lot 2547 SP255326. The total protected area covers 1,779.6 km^2 and intersects the Project area within the Southern Connection, between KP 22DS and KP 54DS. No authority is required for the Project traversing this nature refuge, therefore no offset requirements under the EO Act are triggered. The White Mountain National Park is located approximately 5 km north of the Project area between Pentland and Torrens Creek at KP 198WD-228WD. This protected area is not impacted by the Project. No other protected areas are intersected by or in the vicinity of the Project.	Potential
Highly protected zones of State marine parks	Highly protected area means a zone classified as a conservation park zone, marine national park zone or preservation zone, or another area prescribed under a regulation or a zoning plan as a highly protected area	These zones are within the Great Barrier Reef Coast Marine Park, Moreton Bay Marine Park and Great Sandy Marine Park. These marine parks are not intersected or impacted by the Project area.	No
Declared fish habitat areas	An areas declared under the *Fisheries Act 1994* to be a fish habitat area	The Project does not intersect any declared fish habitat areas.	No

MSES category	Trigger	Presence	Impact
Waterway providing for fish passage	Any part of a waterway that provides for passage of fish, if the construction, installation or modification of waterway barrier works carried out under an authority will limit the passage of fish along the waterway.	The Project area is mapped to frequently cross four risk categories of waterways for waterway barrier works (low, moderate, high and major). However, almost all of these waterways are ephemeral and only flow during heavy rains or flood events. The middle section of the corridor selection, the CopperString Core, contains major ephemeral waterways that flow to the Gulf of Carpentaria, namely, the Flinders River, Fullarton River and Williams River. The remainder of the corridor selection contains mostly smaller, low to high level waterways. These lower level creeks exist as tributaries to the major river systems, and are generally ephemeral. It is unlikely that the Project will require waterway barrier works that would impact fish passage along a waterway, or require an authority to carry out waterway barrier works, therefore no offset requirements triggered.	Unlikely
Marine plants	Marine plants are protected under the *Fisheries Act 1994.*	The Project will not require the removal of marine plants during the construction of waterway crossings as it is not located within a coastal area.	No
Legally secured offset areas	All legally secured offset areas.	The Project does not intersect any legally secured offset areas.	No




146°40'0"E
146°45'0"E
146°50'0"E
146°55'0"E
147°0'0"E
147°5'0"E
19°55'0"S
20°0'0"S
20°5'0"S
FLINDERS HIGHWAY
GLENKIRK ROAD
AYR RAVENSWOOD ROAD
SILVER VALLEY ROAD
AVOCA VALE ROAD
BURDEKIN FALLS DAM ROAD
KP 0WD
Woodstock Substation
KP 5WD
KP 10WD
KP 15WD
KP 20WD
KP 25WD
KP 30WD
KP 35WD
KP 40WD
KP 45WD
KP 50WD
KP 55WD
MSES
High ecological significance wetlands
Protected area - estates
Regulated vegetation - intersecting a watercourse
Regulated vegetation - 100m from wetland
Regulated vegetation - category B endangered or of concern
Regulated vegetation - category C endangered or of concern
Regulated vegetation - category R GBR riverine
Regulated vegetation - essential_habitat
Wildlife habitat - endangered or vulnerable wildlife
Wildlife habitat - special least concern animal
Legend
Town/City
Kilometre Post
Proposed Substation
CopperString Alignment
2.5 km buffer (study area)
Railway
Highway
Local Connector Road
Street
0 1 2 3 4 5
Kilometres
Coordinate System
MGA1994 Zone 54\55
Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.
WKSP MSES_RevB
CopperString 2.0 EIS
Figure 21-2A - Mapped Matters of State Environmental Significance
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ



Legend

- Town/City
- Kilometre Post
- CopperString Alignment
- 2.5 km buffer (study area)
- Railway
- Highway
- Local Connector Road
- Street

0 1 2 3 4 5

Kilometres
Coordinate System
MGA1994 Zone 54\55

Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020

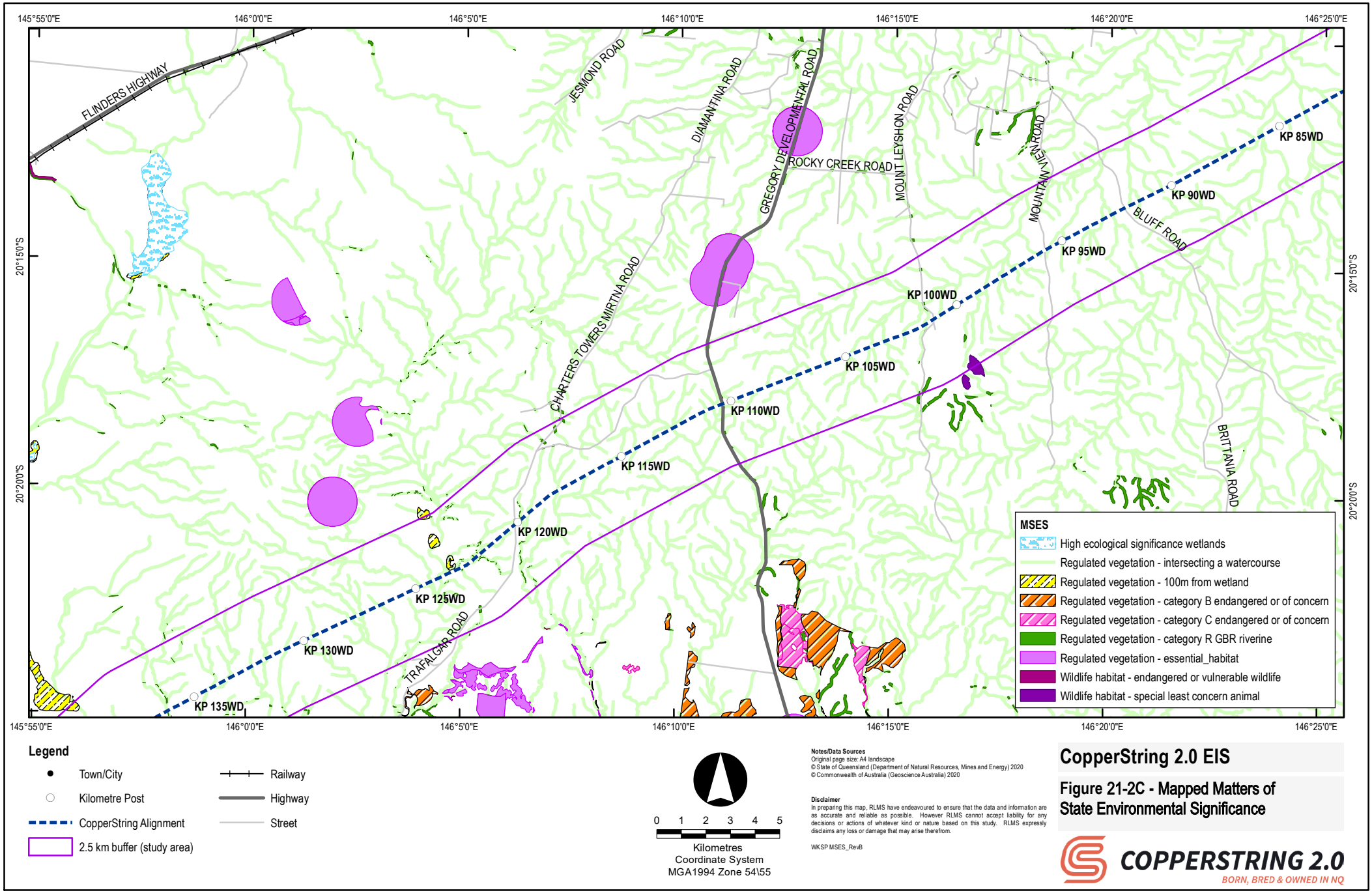
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

WKSP MSES_RevB

CopperString 2.0 EIS

Figure 21-2B - Mapped Matters of State Environmental Significance

COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ



Legend

- Town/City
- Kilometre Post
- CopperString Alignment
- 2.5 km buffer (study area)
- Railway
- Highway
- Street

0 1 2 3 4 5

Kilometres
Coordinate System
MGA1994 Zone 54\55

Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020

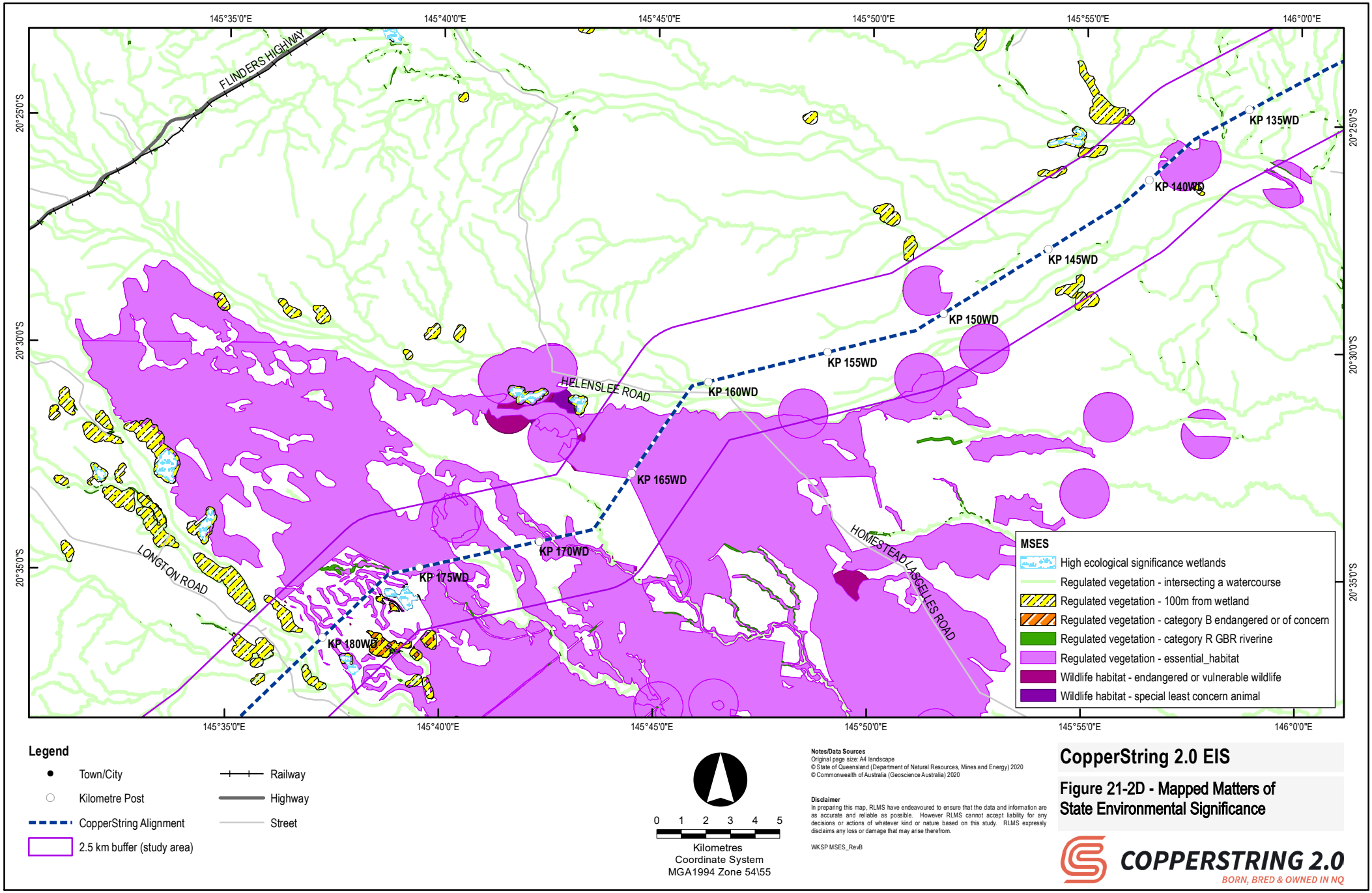
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

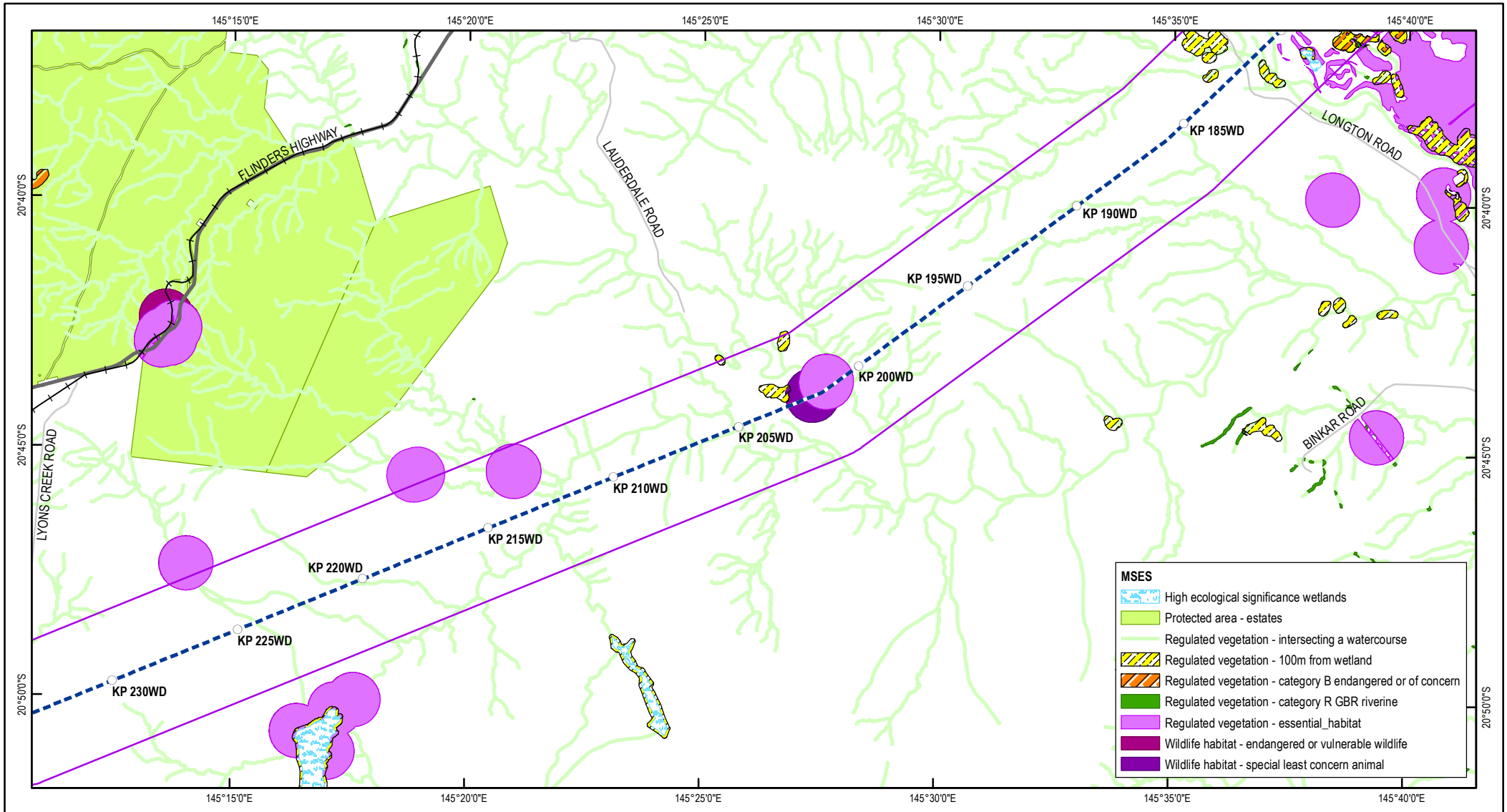
WKSP MSES_RevB

CopperString 2.0 EIS

Figure 21-2C - Mapped Matters of State Environmental Significance

COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ


145°35'0"E
145°40'0"E
145°45'0"E
145°50'0"E
145°55'0"E
146°0'0"E
20°25'0"S
20°30'0"S
20°35'0"S
FLINDERS HIGHWAY
HELENSLEE ROAD
LONGTON ROAD
HOMESTEAD LASCELLES ROAD
KP 135WD
KP 140WD
KP 145WD
KP 150WD
KP 155WD
KP 160WD
KP 165WD
KP 170WD
KP 175WD
KP 180WD
MSES
High ecological significance wetlands
Regulated vegetation - intersecting a watercourse
Regulated vegetation - 100m from wetland
Regulated vegetation - category B endangered or of concern
Regulated vegetation - category R GBR riverine
Regulated vegetation - essential_habitat
Wildlife habitat - endangered or vulnerable wildlife
Wildlife habitat - special least concern animal
Legend
Town/City
Kilometre Post
CopperString Alignment
2.5 km buffer (study area)
Railway
Highway
Street
0 1 2 3 4 5
Kilometres
Coordinate System
MGA1994 Zone 54\55
Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.
WKSP MSES_RevB
CopperString 2.0 EIS
Figure 21-2D - Mapped Matters of State Environmental Significance
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ



Legend

- Town/City
- Kilometre Post
- CopperString Alignment
- 2.5 km buffer (study area)
- Railway
- Highway
- Street

0 1 2 3 4 5

Kilometres
Coordinate System
MGA1994 Zone 54\55

Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020

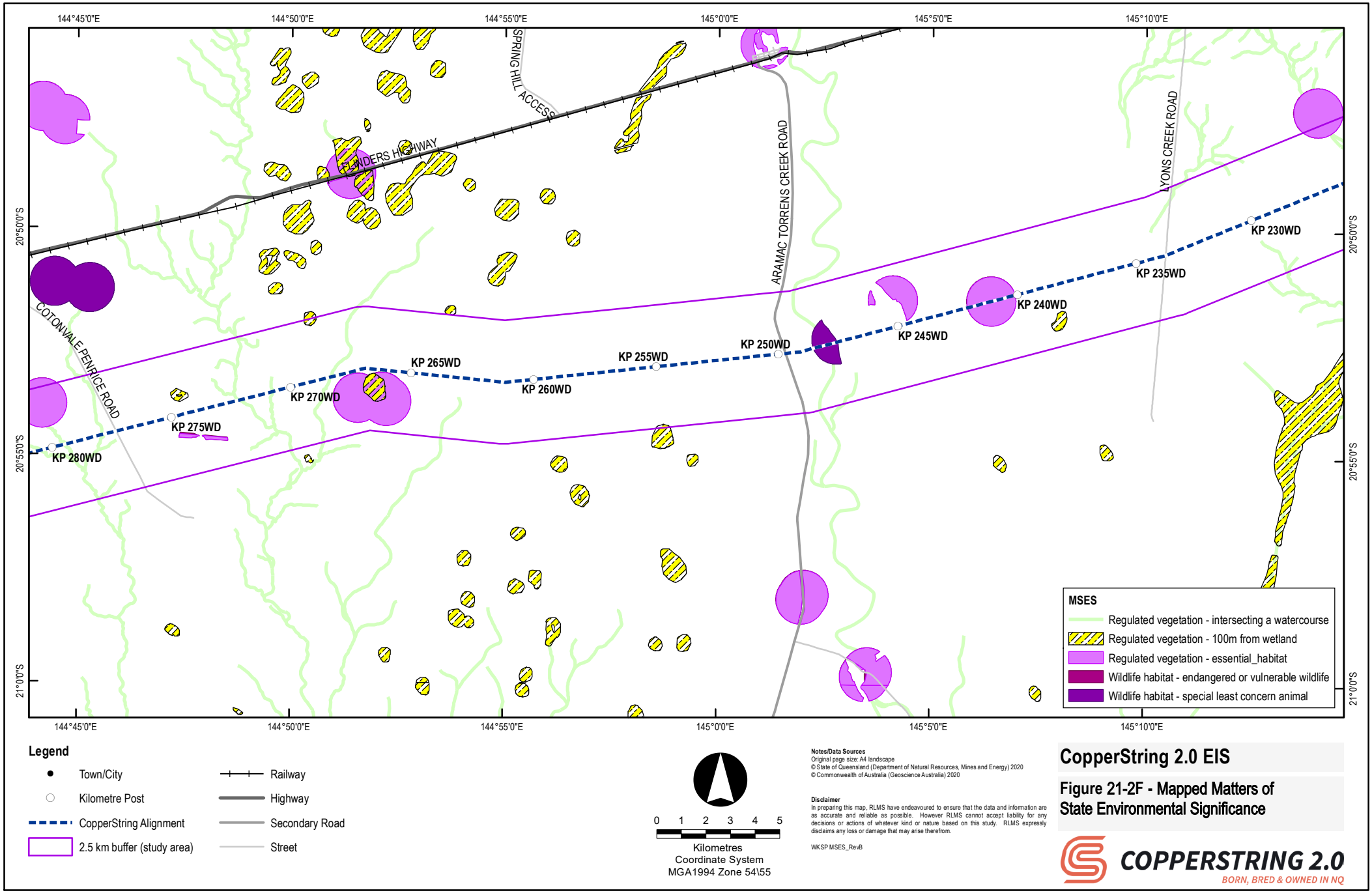
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

WKSP MSES_RevB

CopperString 2.0 EIS

Figure 21-2E - Mapped Matters of State Environmental Significance

COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ



Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020

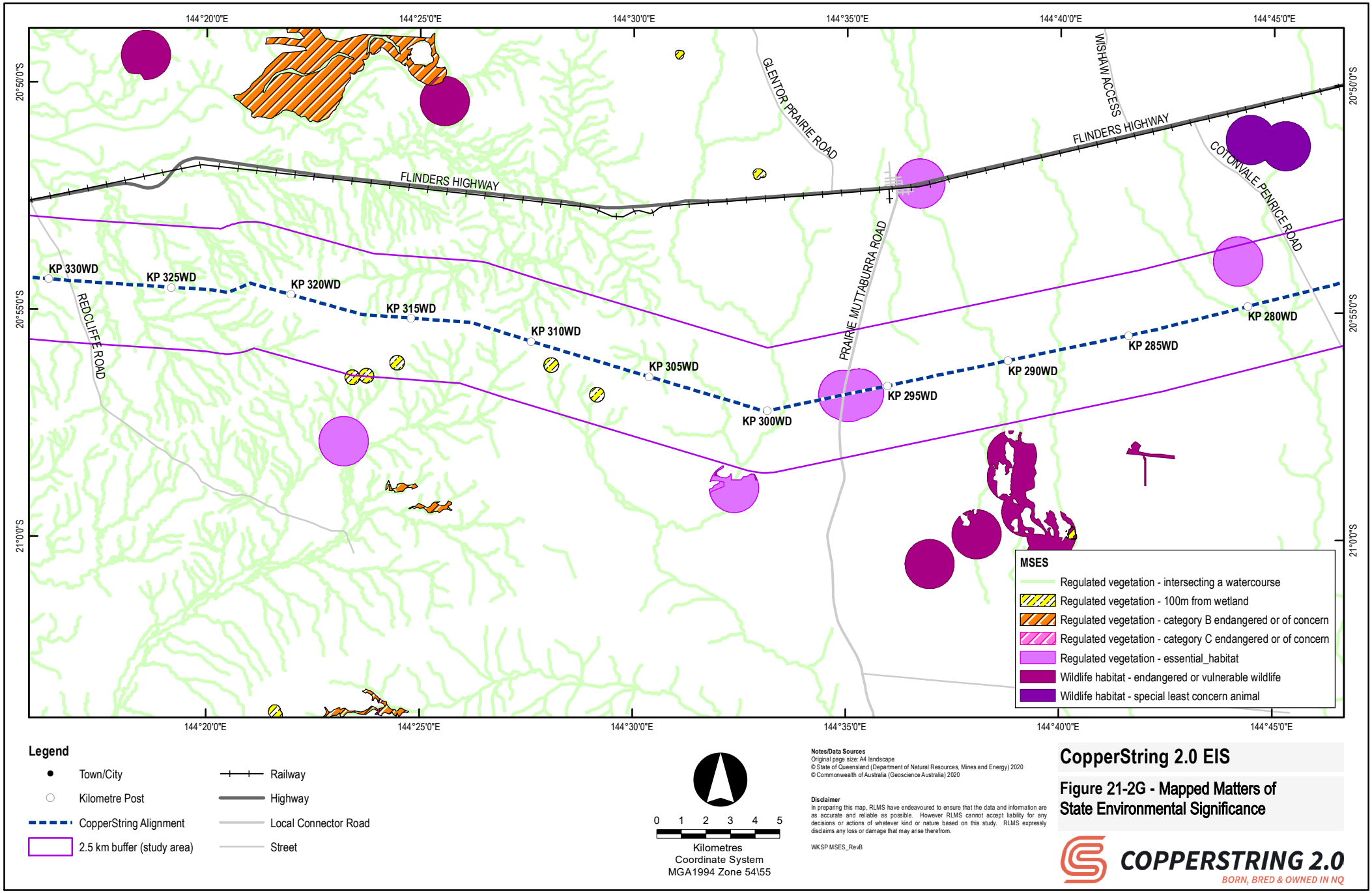
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

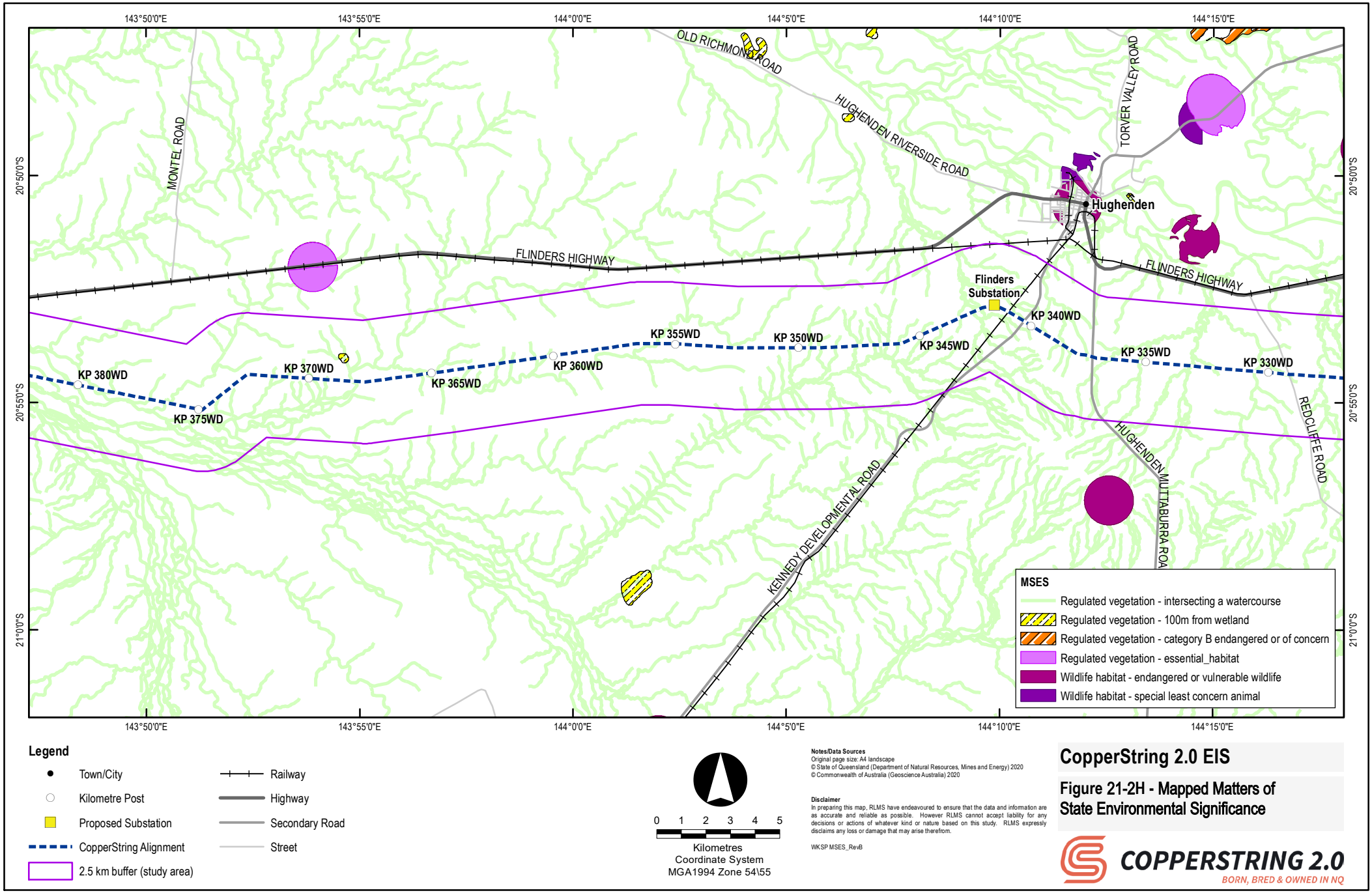
WKSP MSES_RevB

CopperString 2.0 EIS

Figure 21-2F - Mapped Matters of State Environmental Significance

COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ


144°20'0"E
144°25'0"E
144°30'0"E
144°35'0"E
144°40'0"E
144°45'0"E
20°50'0"S
20°55'0"S
21°0'0"S
GLENTOR PRAIRIE ROAD
WISHAW ACCESS
FLINDERS HIGHWAY
COTONVALE PENRICE ROAD
PRAIRIE MUTTABURRA ROAD
REDCLIFFE ROAD
KP 330WD
KP 325WD
KP 320WD
KP 315WD
KP 310WD
KP 305WD
KP 300WD
KP 295WD
KP 290WD
KP 285WD
KP 280WD
MSES
Regulated vegetation - intersecting a watercourse
Regulated vegetation - 100m from wetland
Regulated vegetation - category B endangered or of concern
Regulated vegetation - category C endangered or of concern
Regulated vegetation - essential_habitat
Wildlife habitat - endangered or vulnerable wildlife
Wildlife habitat - special least concern animal
Legend
Town/City
Kilometre Post
CopperString Alignment
2.5 km buffer (study area)
Railway
Highway
Local Connector Road
Street
0 1 2 3 4 5
Kilometres
Coordinate System
MGA1994 Zone 54\55
Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.
WKSP MSES_RevB
CopperString 2.0 EIS
Figure 21-2G - Mapped Matters of State Environmental Significance
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ



Legend

- Town/City
- Kilometre Post
- Proposed Substation
- CopperString Alignment
- 2.5 km buffer (study area)
- Railway
- Highway
- Secondary Road
- Street

0 1 2 3 4 5

Kilometres
Coordinate System
MGA1994 Zone 54\55

Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020

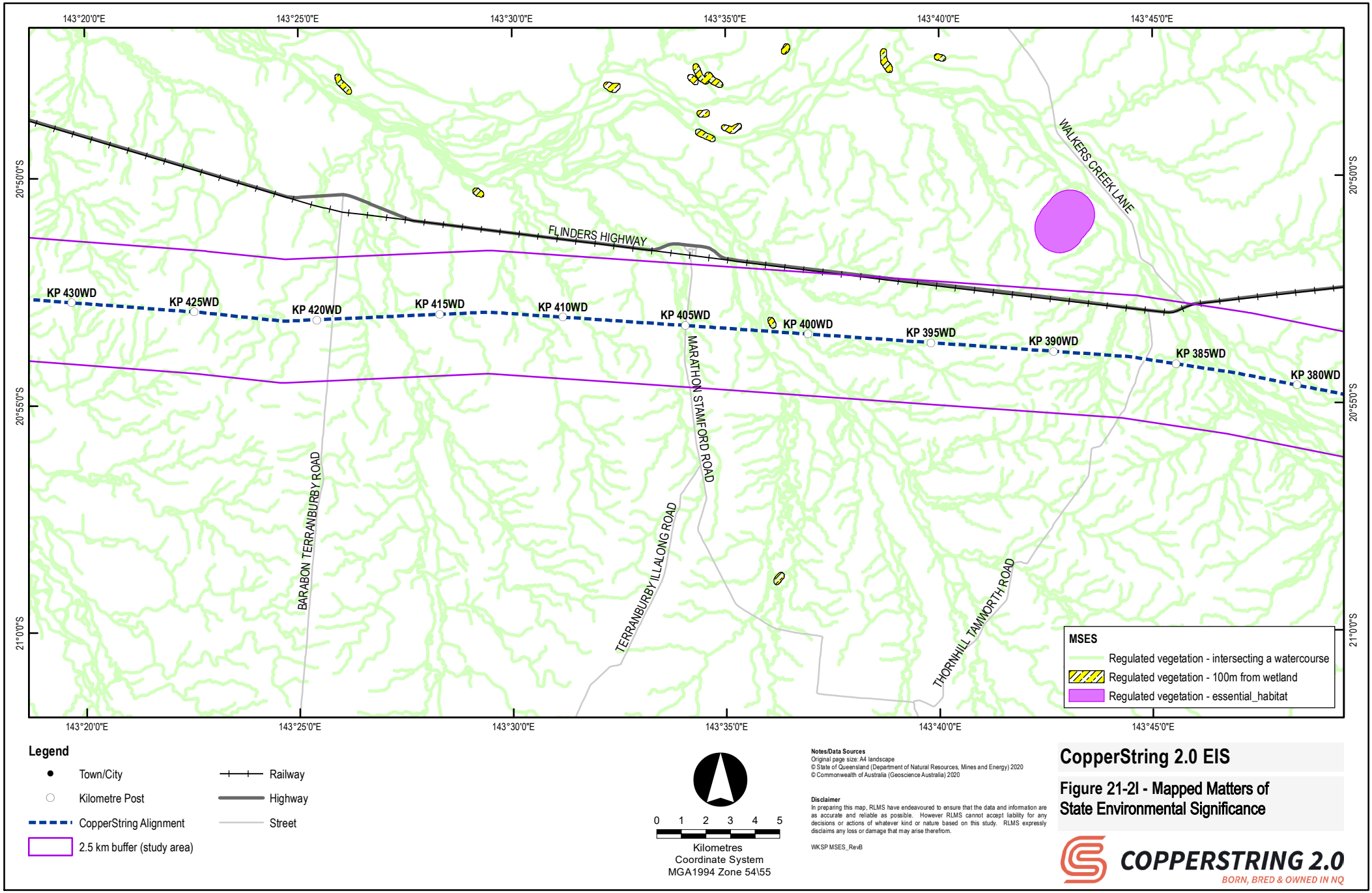
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

WKSP MSES_RevB

CopperString 2.0 EIS

Figure 21-2H - Mapped Matters of State Environmental Significance

COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ



Legend

- Town/City
- Kilometre Post
- CopperString Alignment
- 2.5 km buffer (study area)
- Railway
- Highway
- Street

0 1 2 3 4 5
Kilometres
Coordinate System
MGA1994 Zone 54\55

Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020

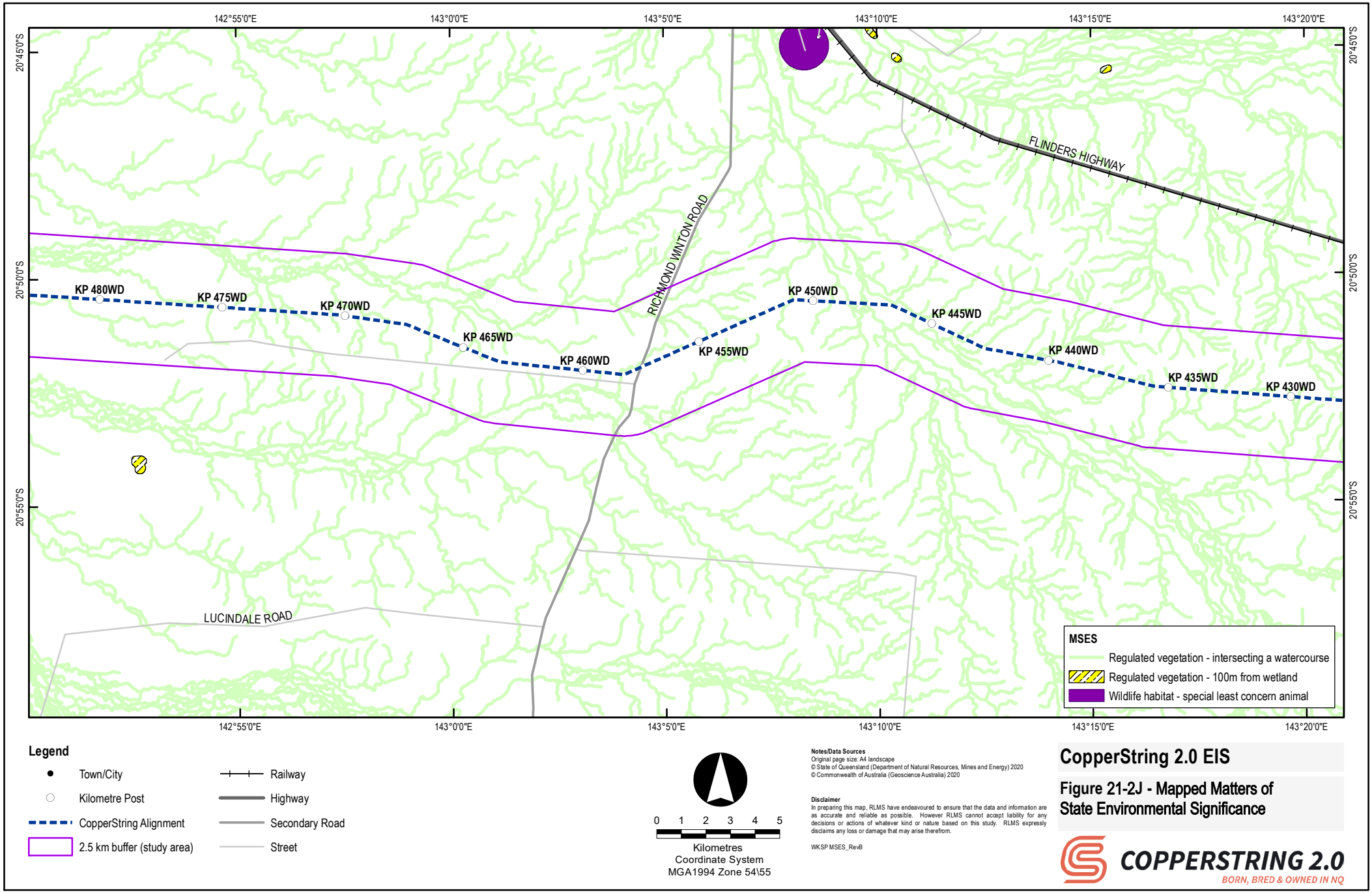
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

WKSP MSES_RevB

CopperString 2.0 EIS

Figure 21-2l - Mapped Matters of State Environmental Significance

COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ



Legend

- Town/City
- Kilometre Post
- CopperString Alignment
- 2.5 km buffer (study area)
- Railway
- Highway
- Secondary Road
- Street

0 1 2 3 4 5
Kilometres
Coordinate System
MGA1994 Zone 54\55

Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020

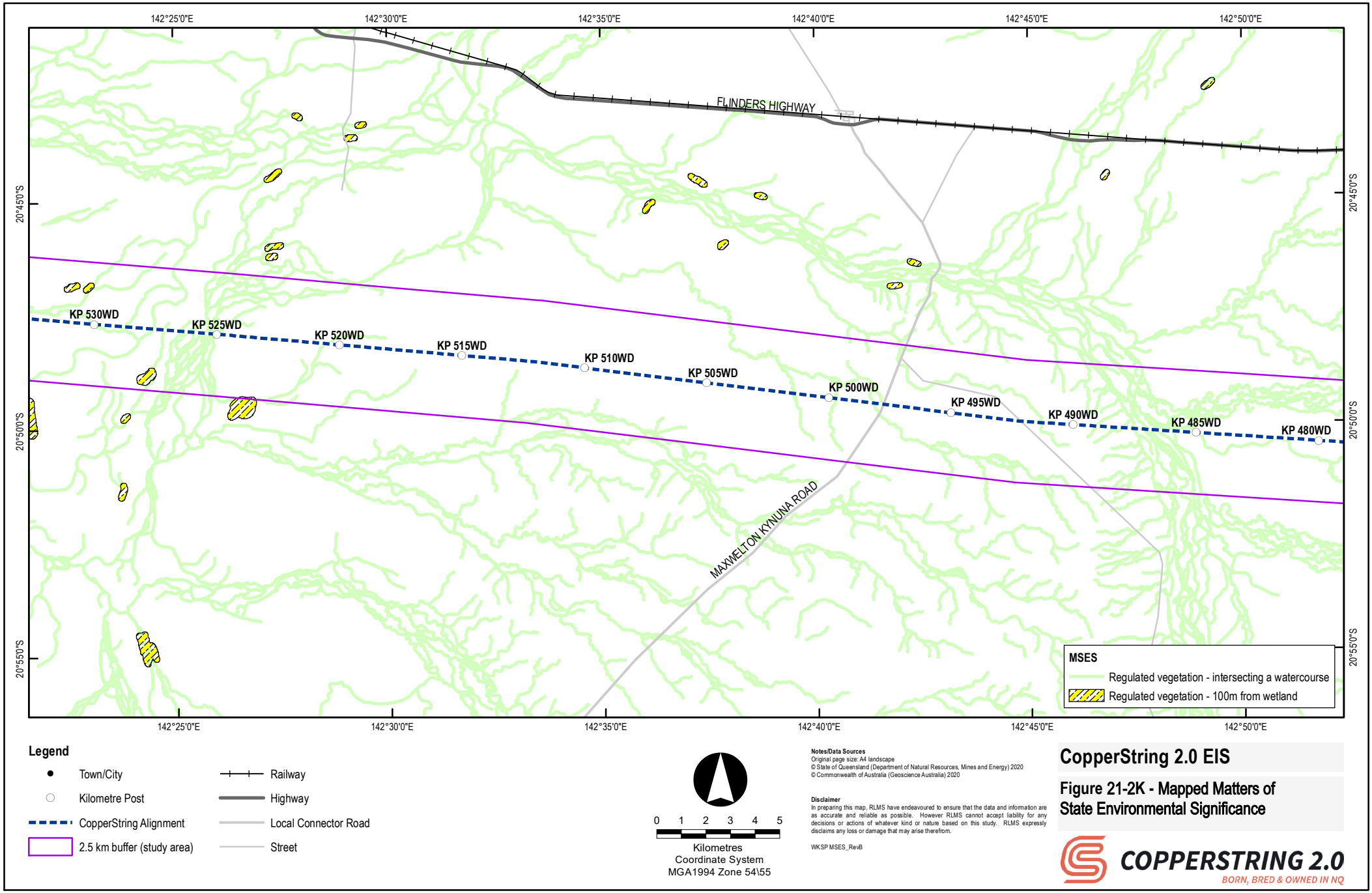
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

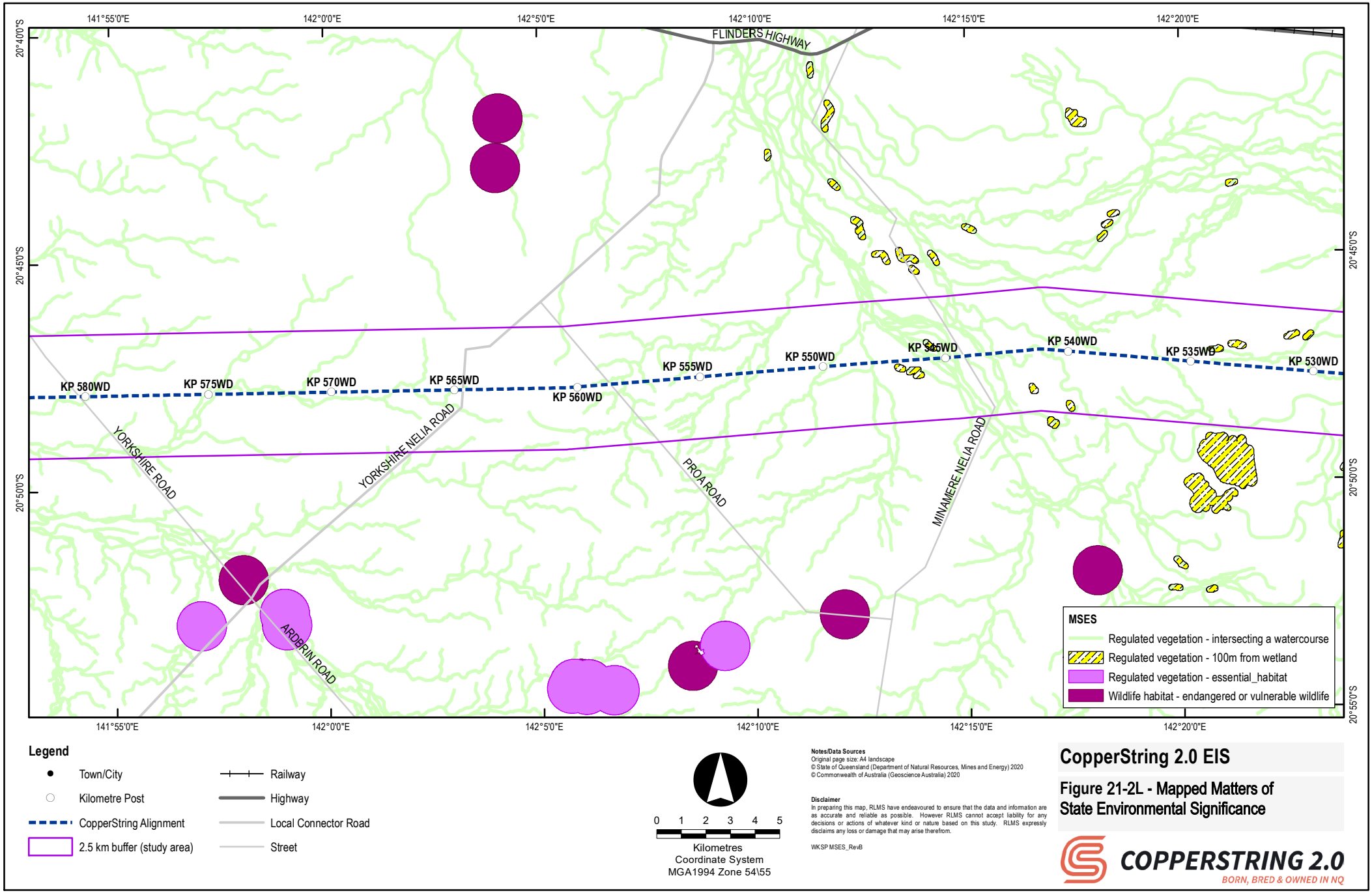
WKSP MSES_RevB

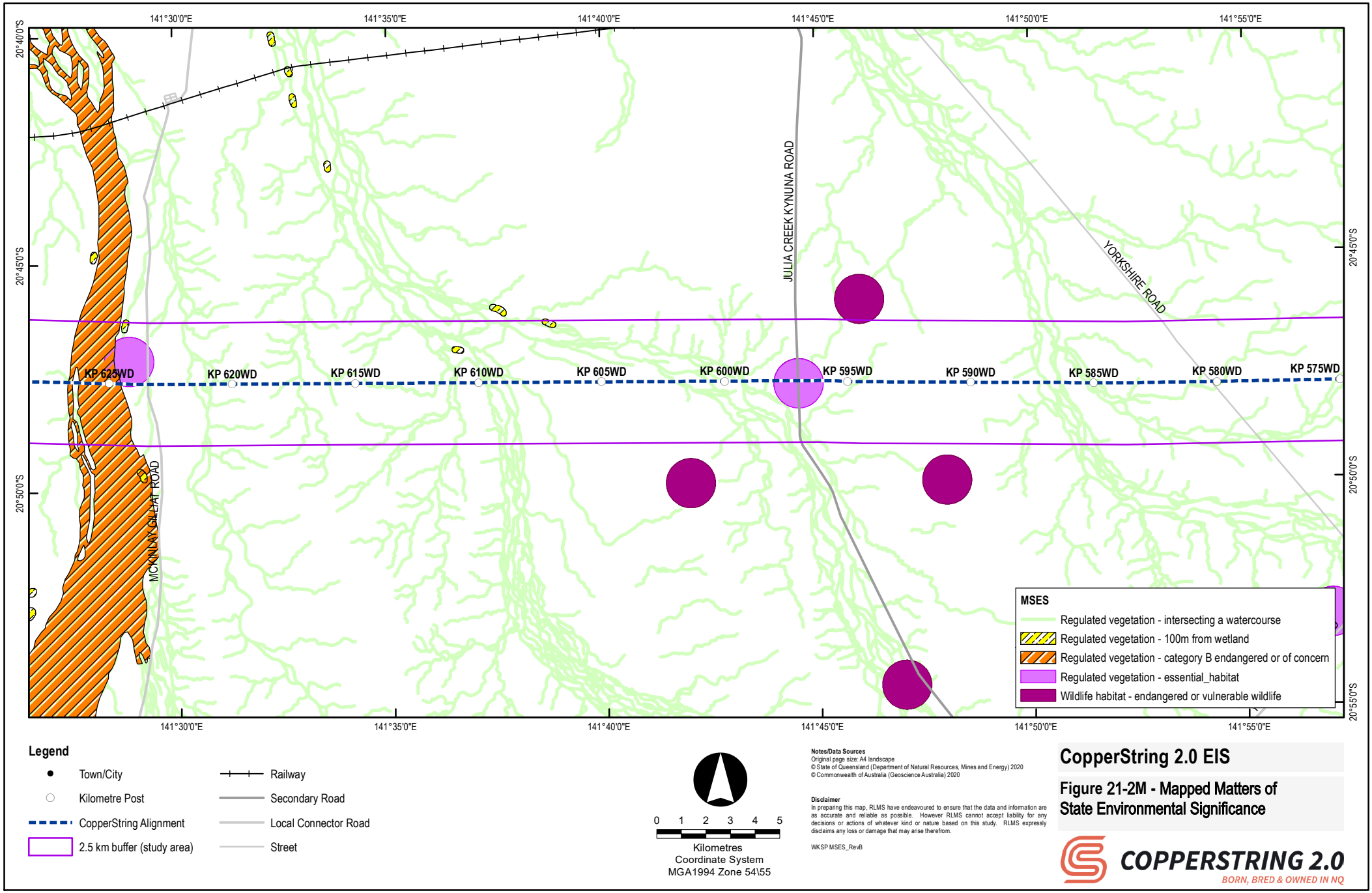
CopperString 2.0 EIS

Figure 21-2J - Mapped Matters of State Environmental Significance

COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ


142°25'0"E
142°30'0"E
142°35'0"E
142°40'0"E
142°45'0"E
142°50'0"E
20°45'0"S
20°50'0"S
20°55'0"S
FLINDERS HIGHWAY
MAXWELTON KYNUNA ROAD
KP 530WD
KP 525WD
KP 520WD
KP 515WD
KP 510WD
KP 505WD
KP 500WD
KP 495WD
KP 490WD
KP 485WD
KP 480WD
MSES
Regulated vegetation - intersecting a watercourse
Regulated vegetation - 100m from wetland
Legend
Town/City
Kilometre Post
CopperString Alignment
2.5 km buffer (study area)
Railway
Highway
Local Connector Road
Street
0 1 2 3 4 5
Kilometres
Coordinate System
MGA1994 Zone 54\55
Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.
WKSP MSES_RevB
CopperString 2.0 EIS
Figure 21-2K - Mapped Matters of State Environmental Significance
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ


141°55'0"E
142°0'0"E
142°5'0"E
142°10'0"E
142°15'0"E
142°20'0"E
20°40'0"S
20°45'0"S
20°50'0"S
20°55'0"S
FLINDERS HIGHWAY
KP 580WD
KP 575WD
KP 570WD
KP 565WD
KP 560WD
KP 555WD
KP 550WD
KP 545WD
KP 540WD
KP 535WD
KP 530WD
YORKSHIRE ROAD
YORKSHIRE NELIA ROAD
PROA ROAD
MINAMERE NELIA ROAD
ARDBRIN ROAD
MSES
Regulated vegetation - intersecting a watercourse
Regulated vegetation - 100m from wetland
Regulated vegetation - essential_habitat
Wildlife habitat - endangered or vulnerable wildlife
Legend
Town/City
Kilometre Post
CopperString Alignment
2.5 km buffer (study area)
Railway
Highway
Local Connector Road
Street
0 1 2 3 4 5
Kilometres
Coordinate System
MGA1994 Zone 54\55
Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.
WKSP MSES_RevB
CopperString 2.0 EIS
Figure 21-2L - Mapped Matters of State Environmental Significance
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ



Legend

- Town/City
- Kilometre Post
- CopperString Alignment
- 2.5 km buffer (study area)
- Railway
- Secondary Road
- Local Connector Road
- Street

0 1 2 3 4 5

Kilometres
Coordinate System
MGA1994 Zone 54\55

Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020

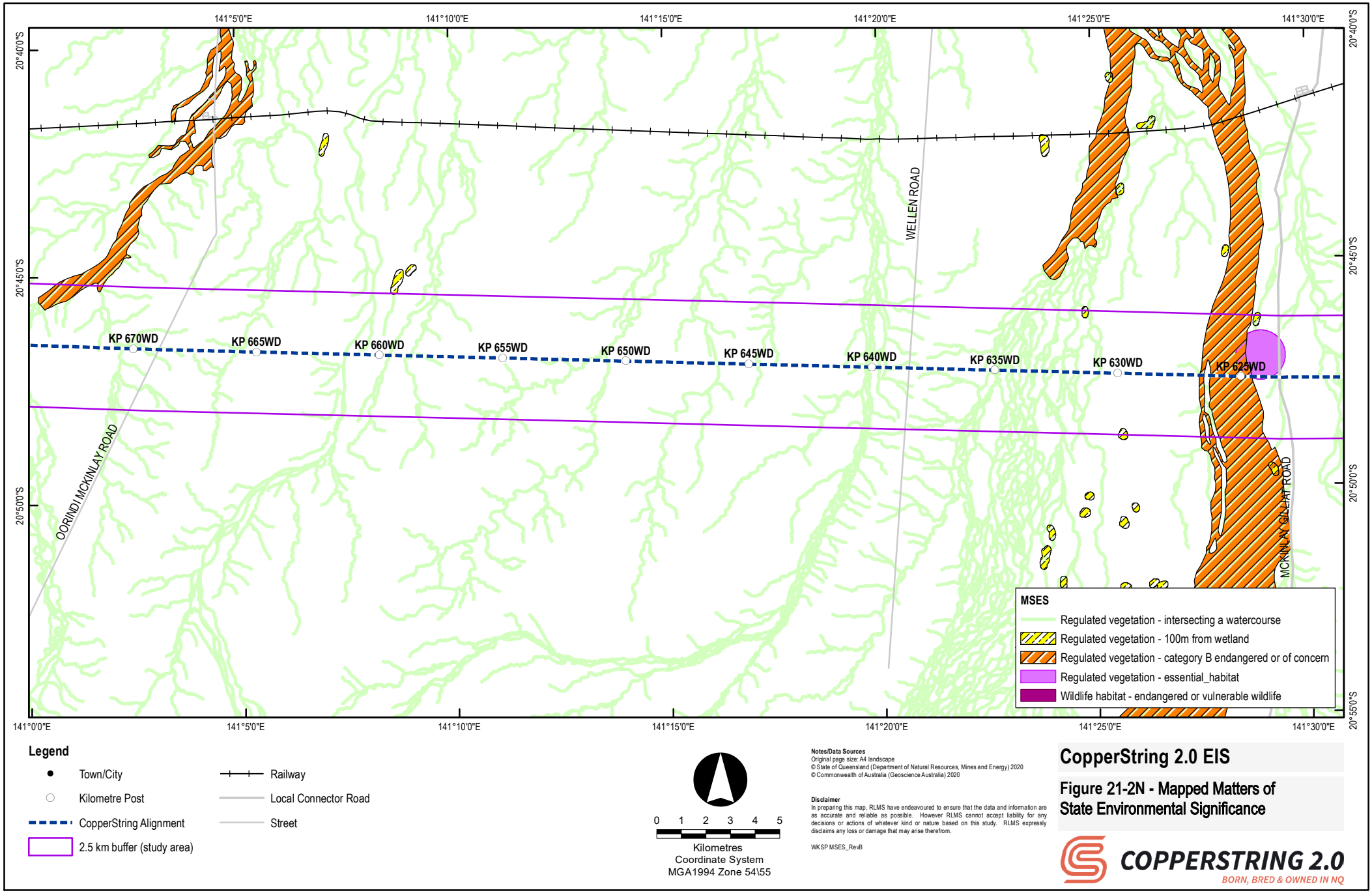
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

WKSP MSES_RevB

CopperString 2.0 EIS

Figure 21-2M - Mapped Matters of State Environmental Significance

COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ



Legend

- Town/City
- Kilometre Post
- CopperString Alignment
- 2.5 km buffer (study area)
- Railway
- Local Connector Road
- Street

0 1 2 3 4 5

Kilometres

Coordinate System
MGA1994 Zone 54\55

Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020

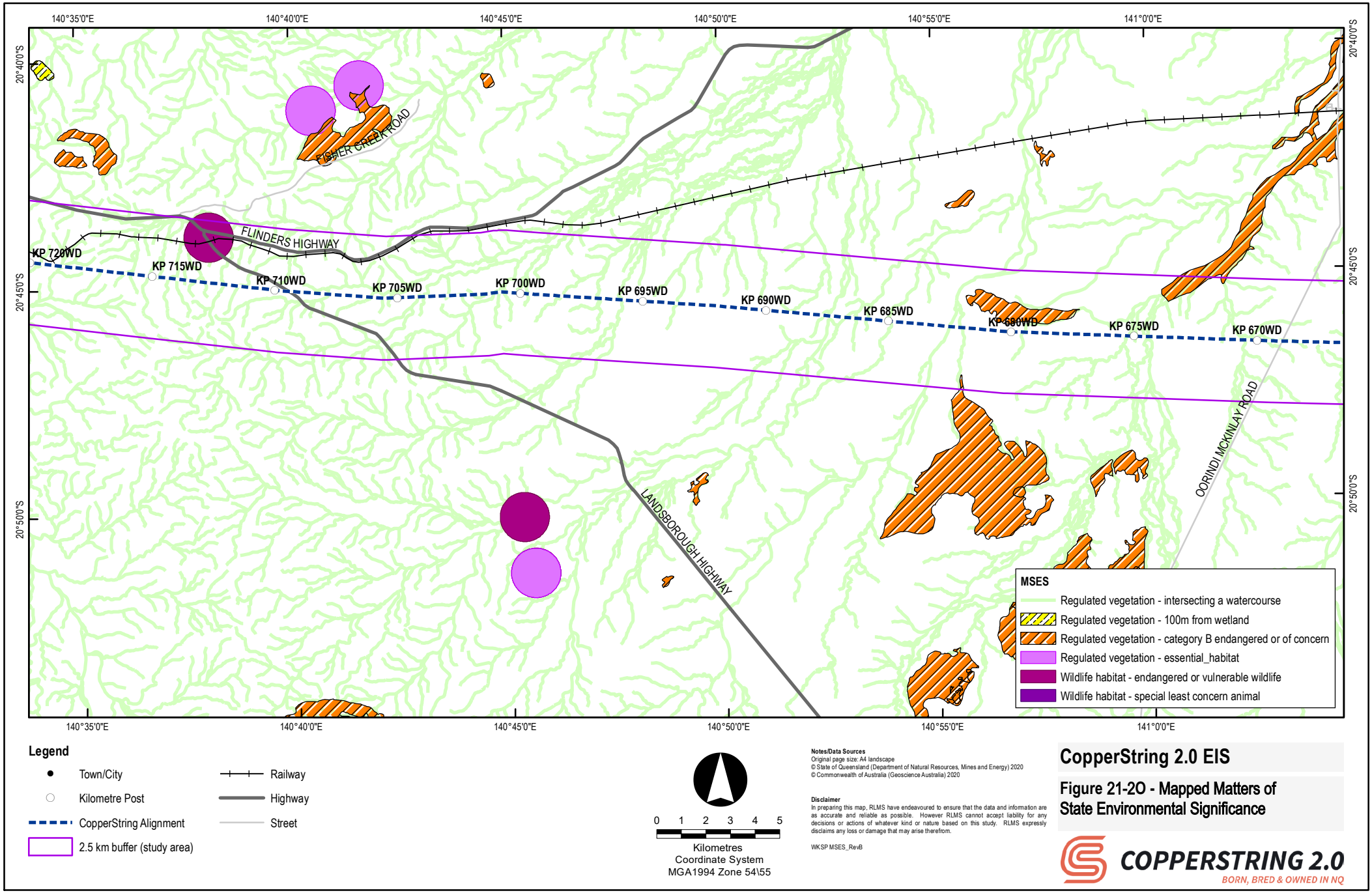
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

WKSP MSES_RevB

CopperString 2.0 EIS

Figure 21-2N - Mapped Matters of State Environmental Significance

COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ



Legend

- Town/City
- Kilometre Post
- CopperString Alignment
- 2.5 km buffer (study area)
- Railway
- Highway
- Street

0 1 2 3 4 5

Kilometres

Coordinate System
MGA1994 Zone 54\55

Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020

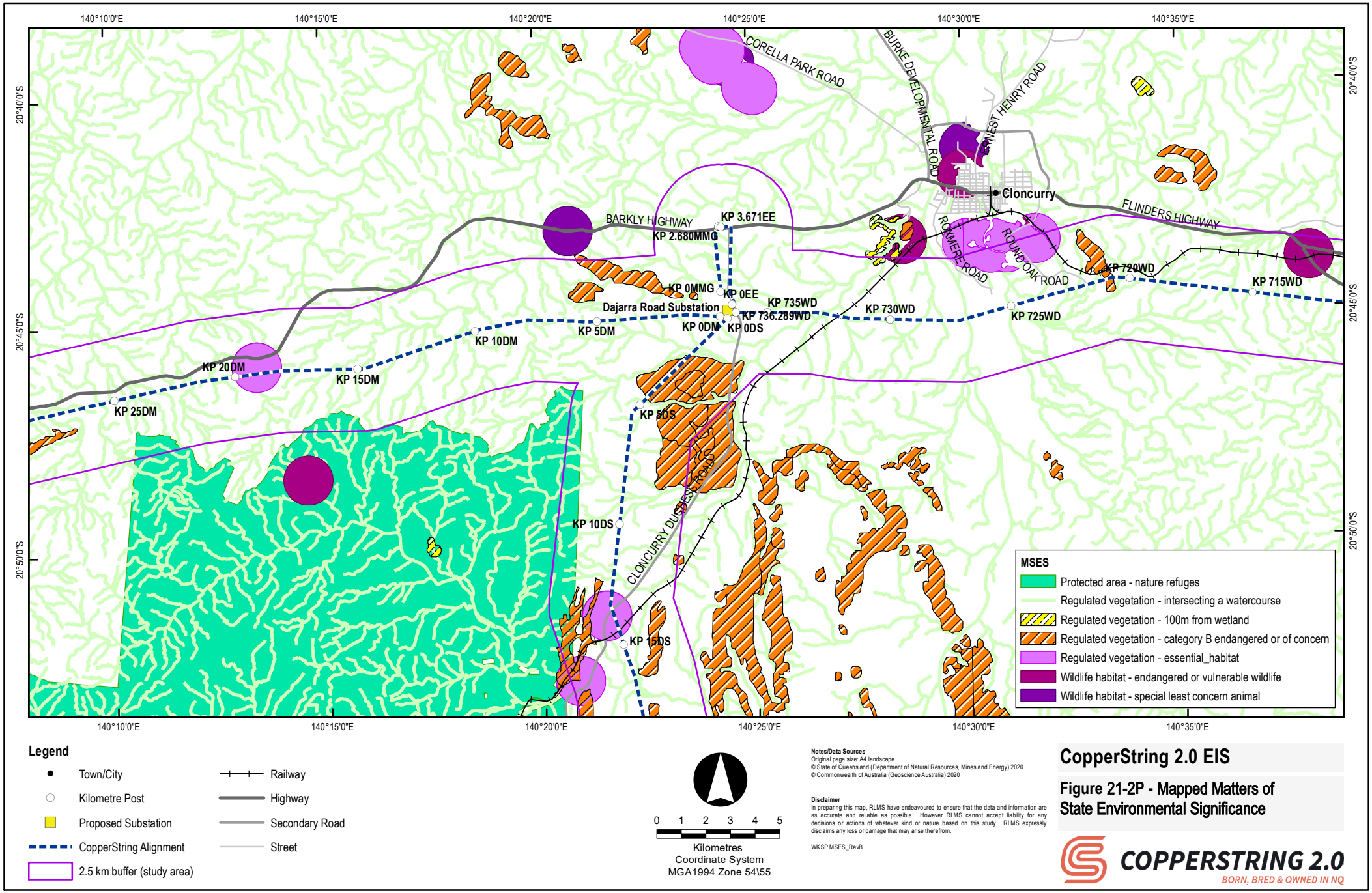
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

WKSP MSES_RevB

CopperString 2.0 EIS

Figure 21-20 - Mapped Matters of State Environmental Significance

COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ



Legend

- Town/City
- Kilometre Post
- Proposed Substation
- CopperString Alignment
- 2.5 km buffer (study area)
- Railway
- Highway
- Secondary Road
- Street

0 1 2 3 4 5
Kilometres
Coordinate System
MGA1994 Zone 54\55

Notes/Data Sources
Original page size: A4 landscape

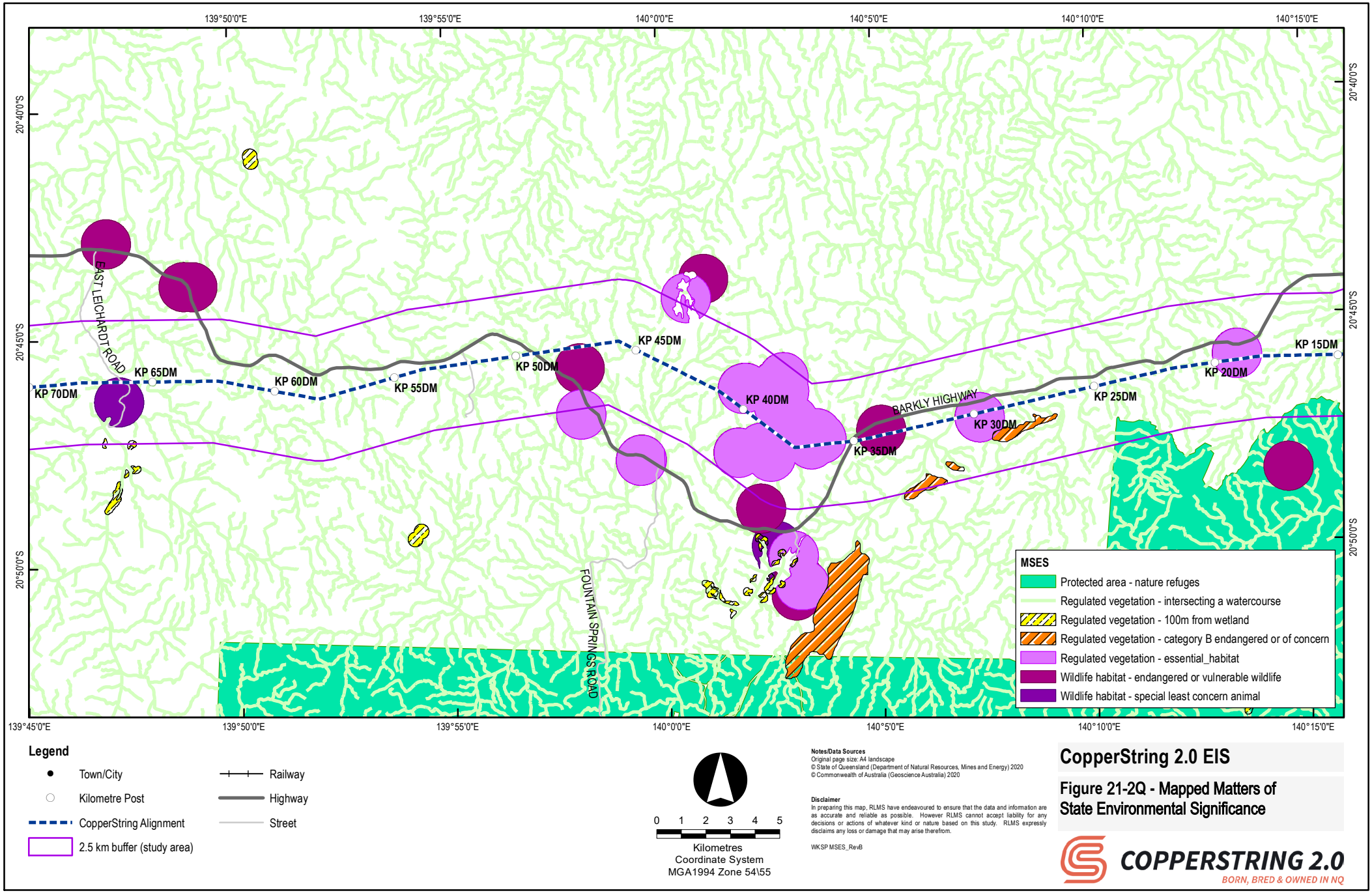
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

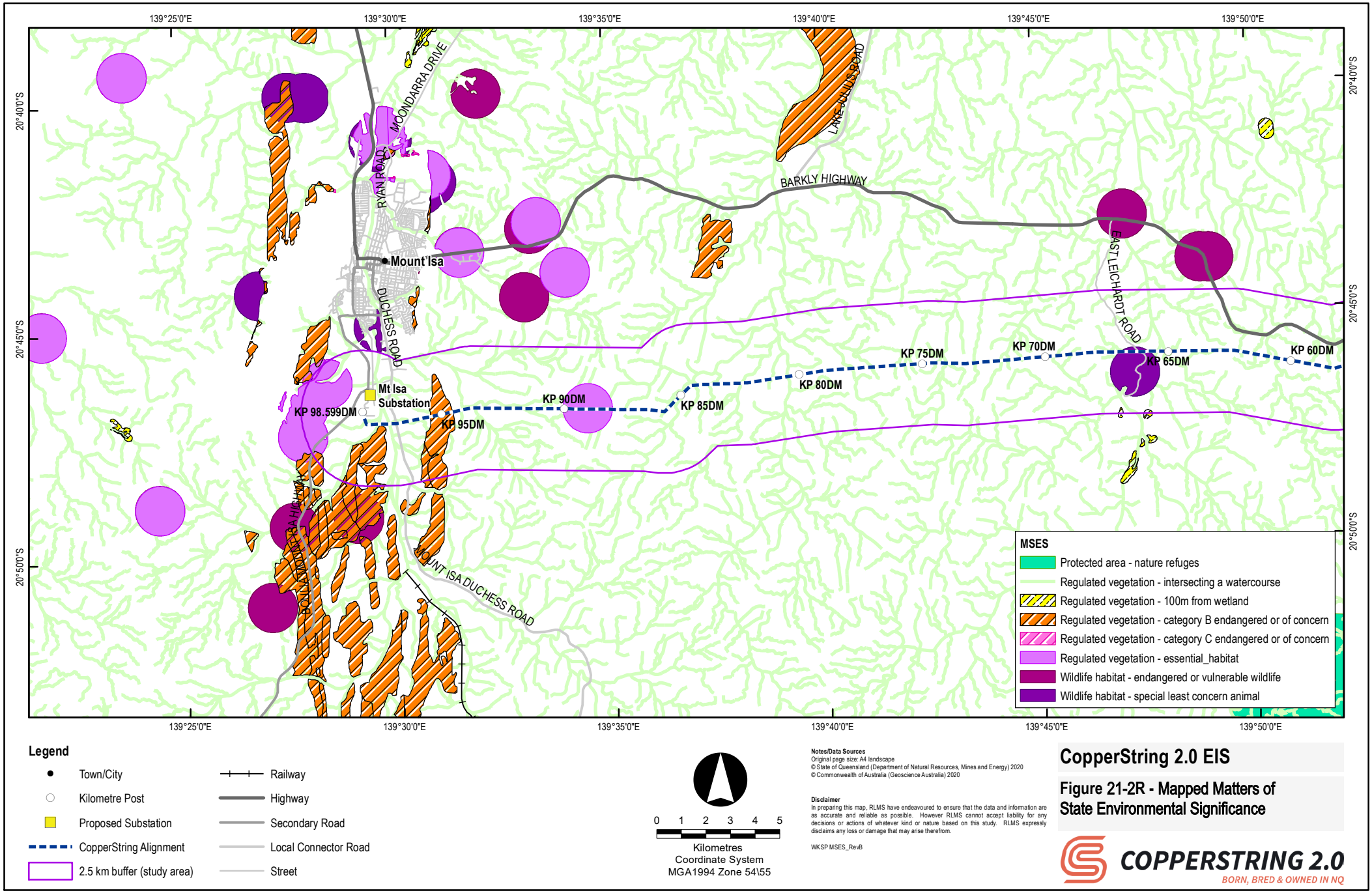
WKSP MSES_RevB

CopperString 2.0 EIS

Figure 21-2P - Mapped Matters of State Environmental Significance

COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ


139°50'0"E
139°55'0"E
140°0'0"E
140°5'0"E
140°10'0"E
140°15'0"E
20°40'0"S
20°45'0"S
20°50'0"S
EAST LEICHHARDT ROAD
KP 70DM
KP 65DM
KP 60DM
KP 55DM
KP 50DM
KP 45DM
KP 40DM
KP 35DM
KP 30DM
KP 25DM
KP 20DM
KP 15DM
BARKLY HIGHWAY
FOUNTAIN SPRINGS ROAD
MSES
Protected area - nature refuges
Regulated vegetation - intersecting a watercourse
Regulated vegetation - 100m from wetland
Regulated vegetation - category B endangered or of concern
Regulated vegetation - essential_habitat
Wildlife habitat - endangered or vulnerable wildlife
Wildlife habitat - special least concern animal
139°45'0"E
Legend
Town/City
Kilometre Post
CopperString Alignment
2.5 km buffer (study area)
Railway
Highway
Street
0 1 2 3 4 5
Kilometres
Coordinate System
MGA1994 Zone 54\55
Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.
WKSP MSES_RevB
CopperString 2.0 EIS
Figure 21-2Q - Mapped Matters of State Environmental Significance
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ



Legend

- Town/City
- Kilometre Post
- Proposed Substation
- CopperString Alignment
- 2.5 km buffer (study area)
- Railway
- Highway
- Secondary Road
- Local Connector Road
- Street

0 1 2 3 4 5
Kilometres
Coordinate System
MGA1994 Zone 54\55

Notes/Data Sources
Original page size: A4 landscape

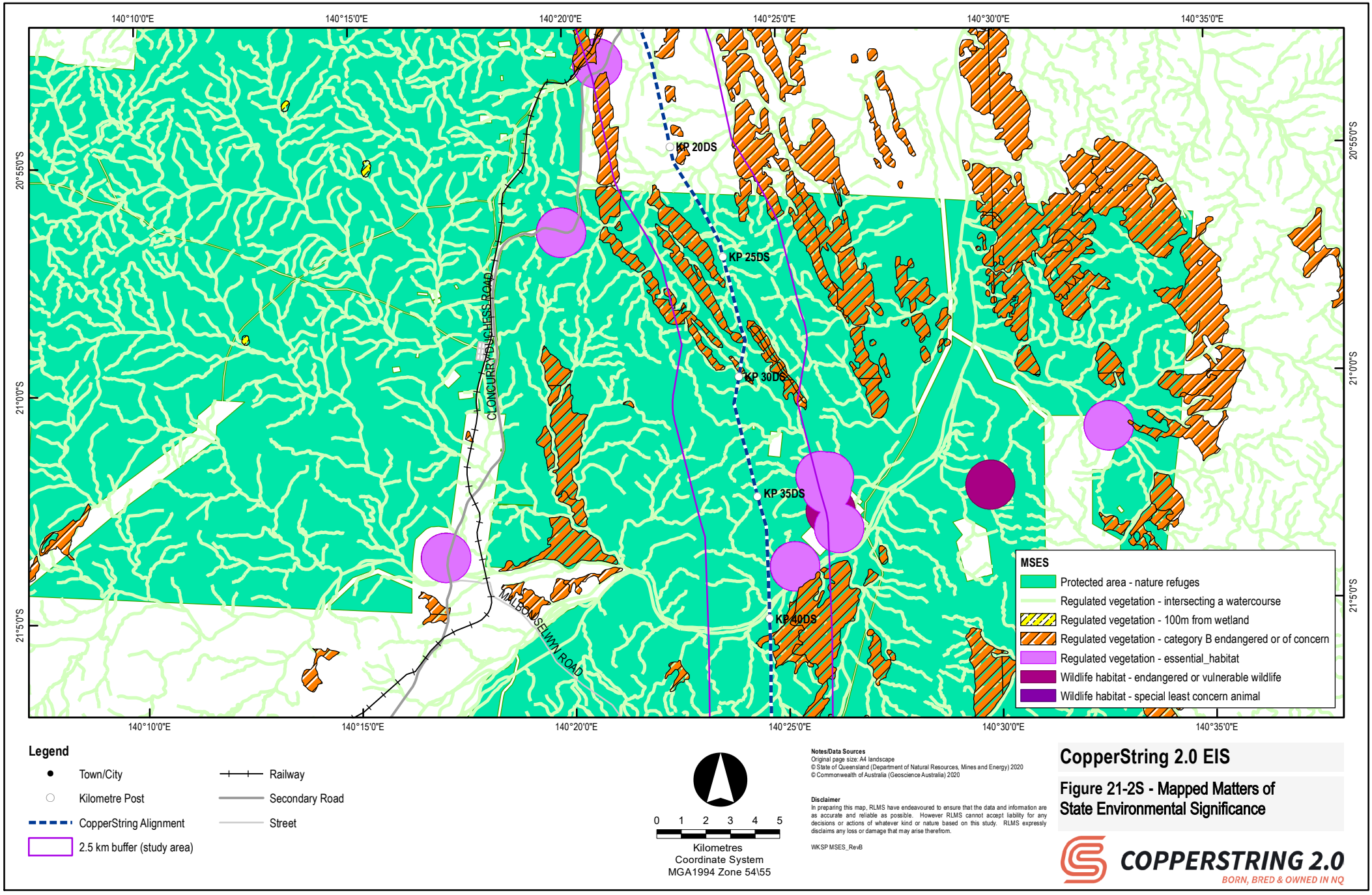
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

WKSP MSES_RevB

CopperString 2.0 EIS

Figure 21-2R - Mapped Matters of State Environmental Significance

COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ



Legend

- Town/City
- Kilometre Post
- CopperString Alignment
- 2.5 km buffer (study area)
- Railway
- Secondary Road
- Street

0 1 2 3 4 5

Kilometres
Coordinate System
MGA1994 Zone 54\55

Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020

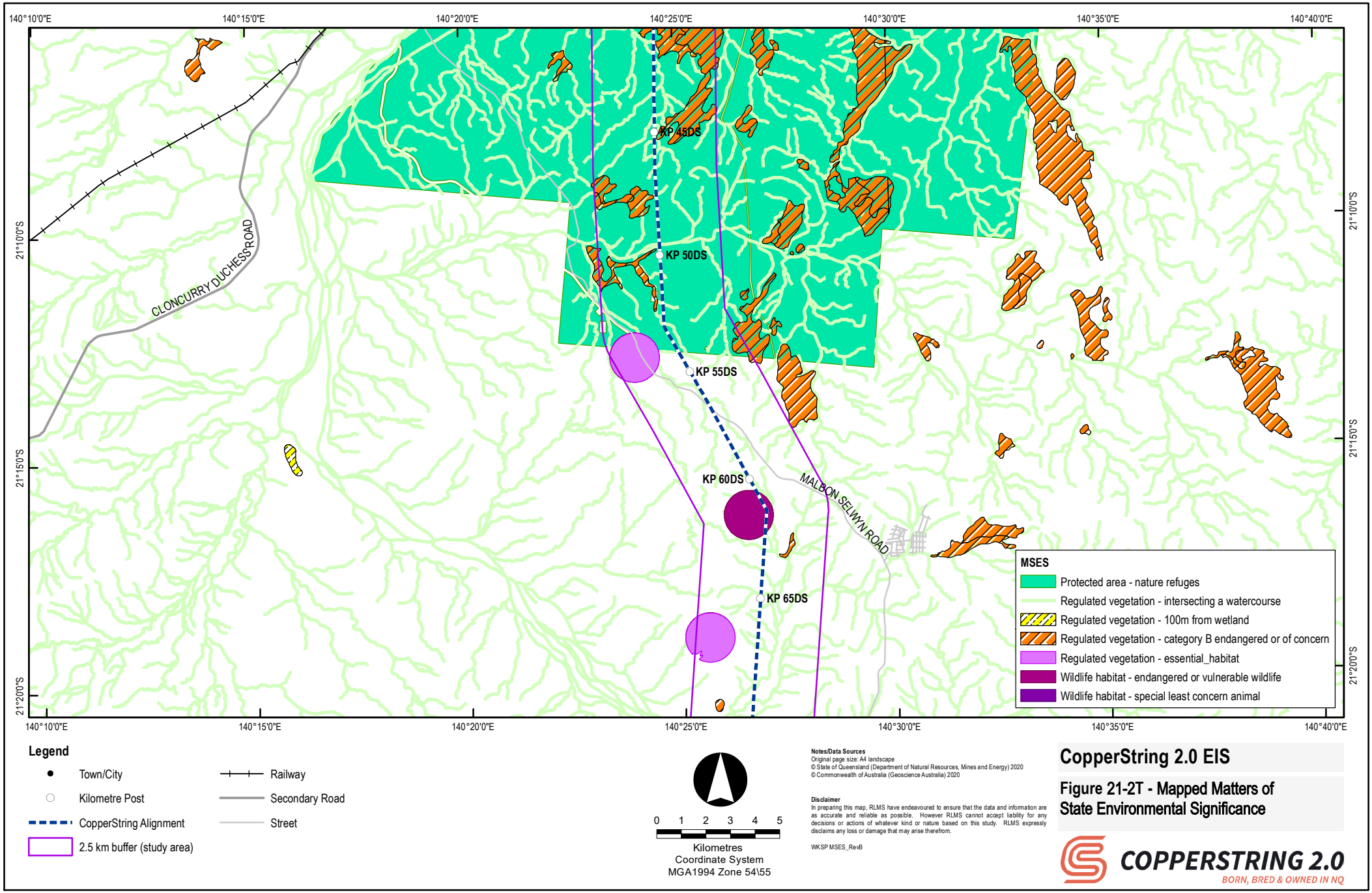
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

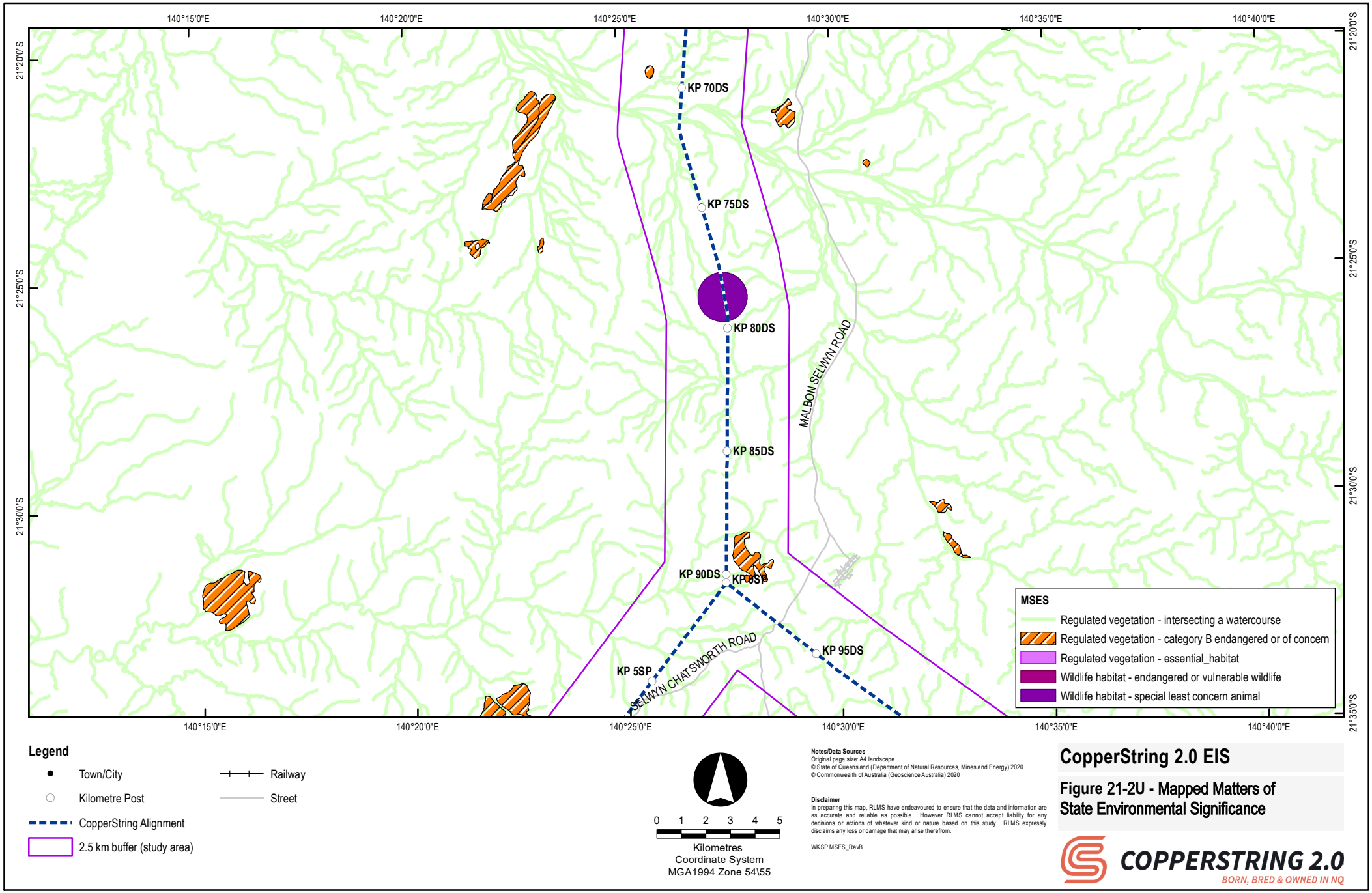
WKSP MSES_RevB

CopperString 2.0 EIS

Figure 21-2S - Mapped Matters of State Environmental Significance

COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ


140°10'0"E
140°15'0"E
140°20'0"E
140°25'0"E
140°30'0"E
140°35'0"E
140°40'0"E
21°10'0"S
21°15'0"S
21°20'0"S
KP 45DS
KP 50DS
KP 55DS
KP 60DS
KP 65DS
CLONCURRY DUCHESS ROAD
MALBON SELWYN ROAD
MSES
Protected area - nature refuges
Regulated vegetation - intersecting a watercourse
Regulated vegetation - 100m from wetland
Regulated vegetation - category B endangered or of concern
Regulated vegetation - essential_habitat
Wildlife habitat - endangered or vulnerable wildlife
Wildlife habitat - special least concern animal
Legend
Town/City
Kilometre Post
CopperString Alignment
2.5 km buffer (study area)
Railway
Secondary Road
Street
0 1 2 3 4 5
Kilometres
Coordinate System
MGA1994 Zone 54\55
Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.
WKSP MSES_RevB
CopperString 2.0 EIS
Figure 21-2T - Mapped Matters of State Environmental Significance
COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ



Legend

- Town/City
- Kilometre Post
- CopperString Alignment
- 2.5 km buffer (study area)
- Railway
- Street

0 1 2 3 4 5
Kilometres
Coordinate System
MGA1994 Zone 54\55

Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020

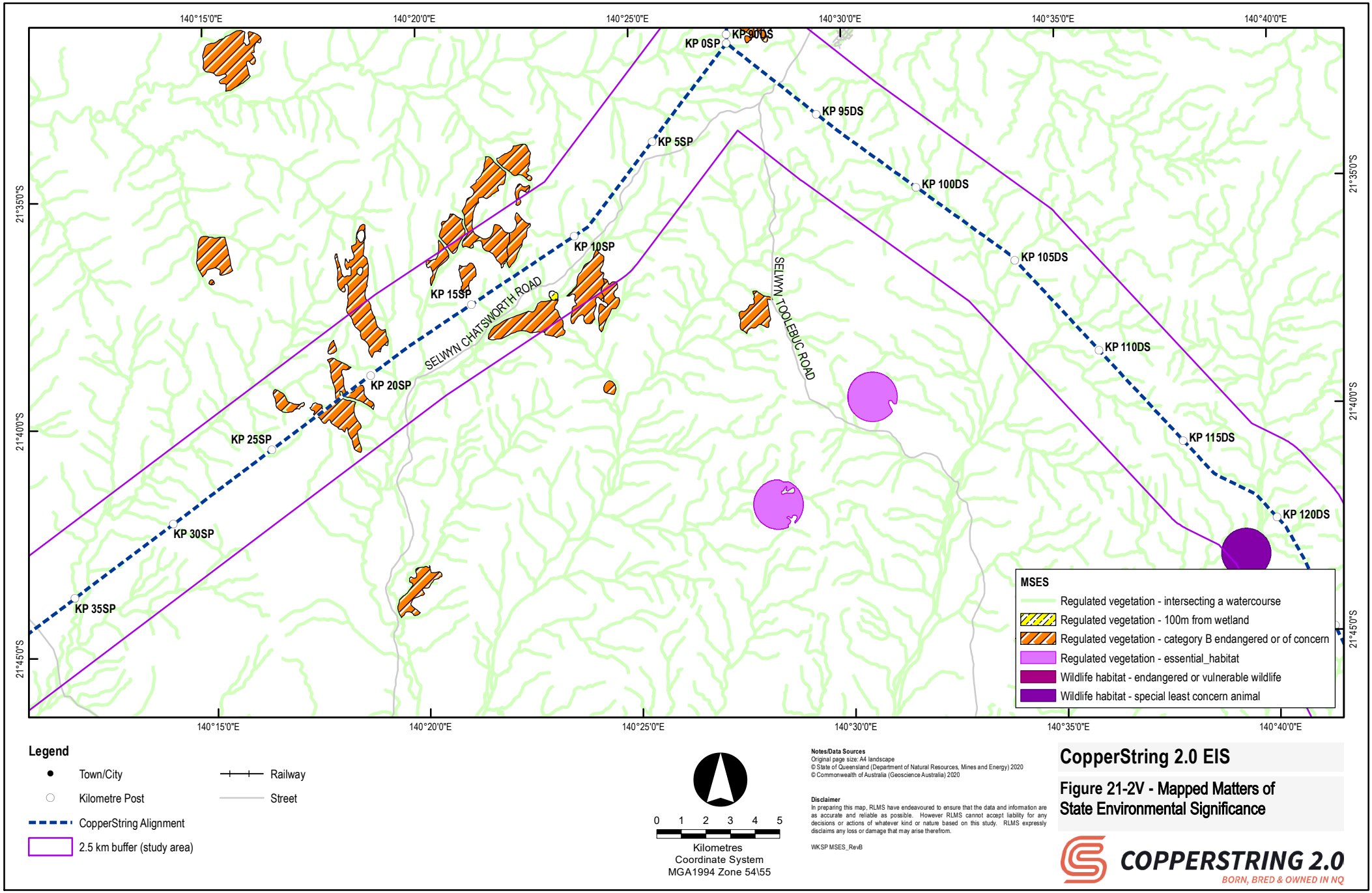
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

WKSP MSES_RevB

CopperString 2.0 EIS

Figure 21-2U - Mapped Matters of State Environmental Significance

COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ



Legend

- Town/City
- Kilometre Post
- CopperString Alignment
- 2.5 km buffer (study area)
- Railway
- Street

0 1 2 3 4 5

Kilometres

Coordinate System
MGA1994 Zone 54\55

Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020

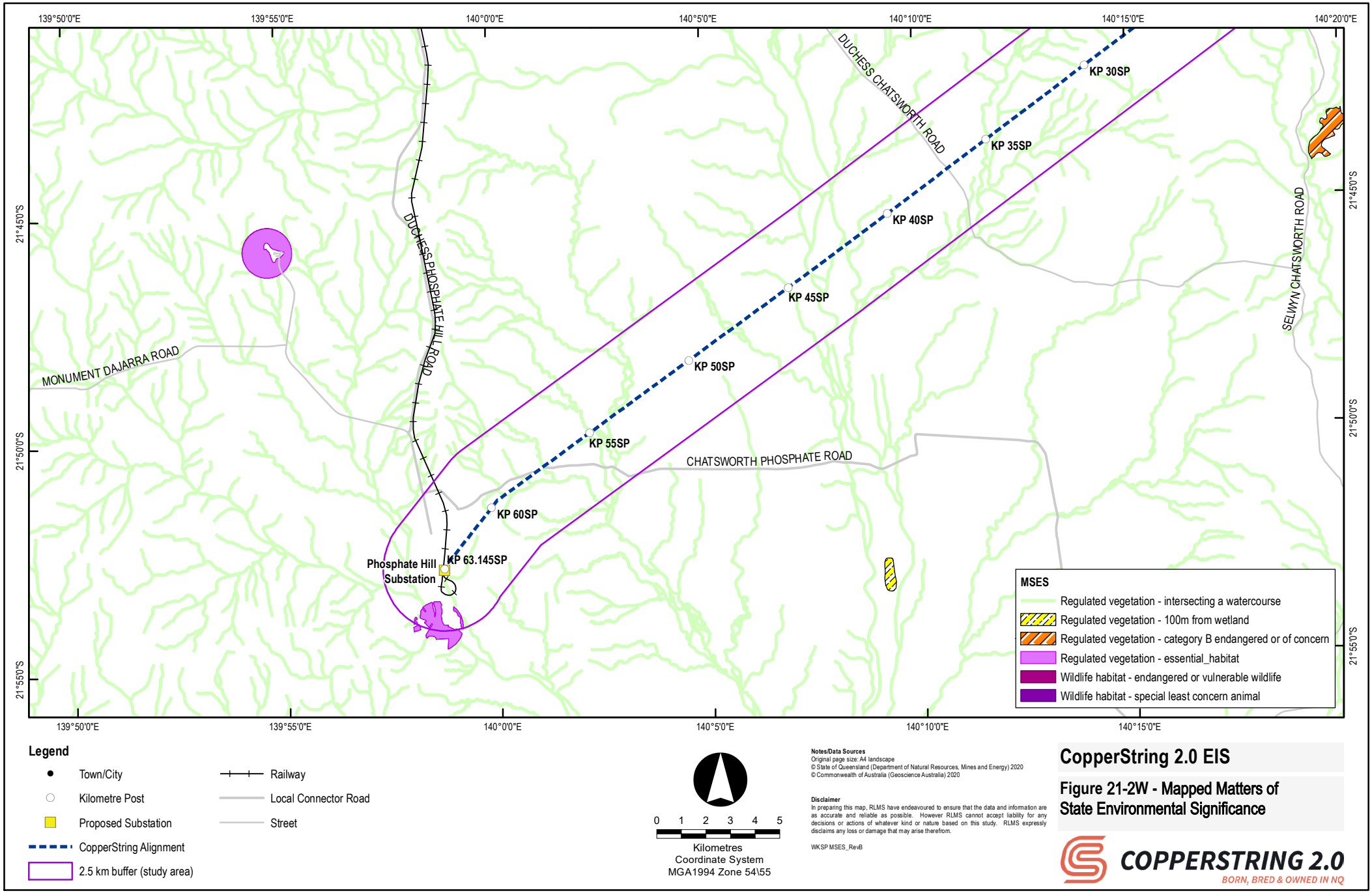
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

WKSP MSES_RevB

CopperString 2.0 EIS

Figure 21-2V - Mapped Matters of State Environmental Significance

COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ



Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020

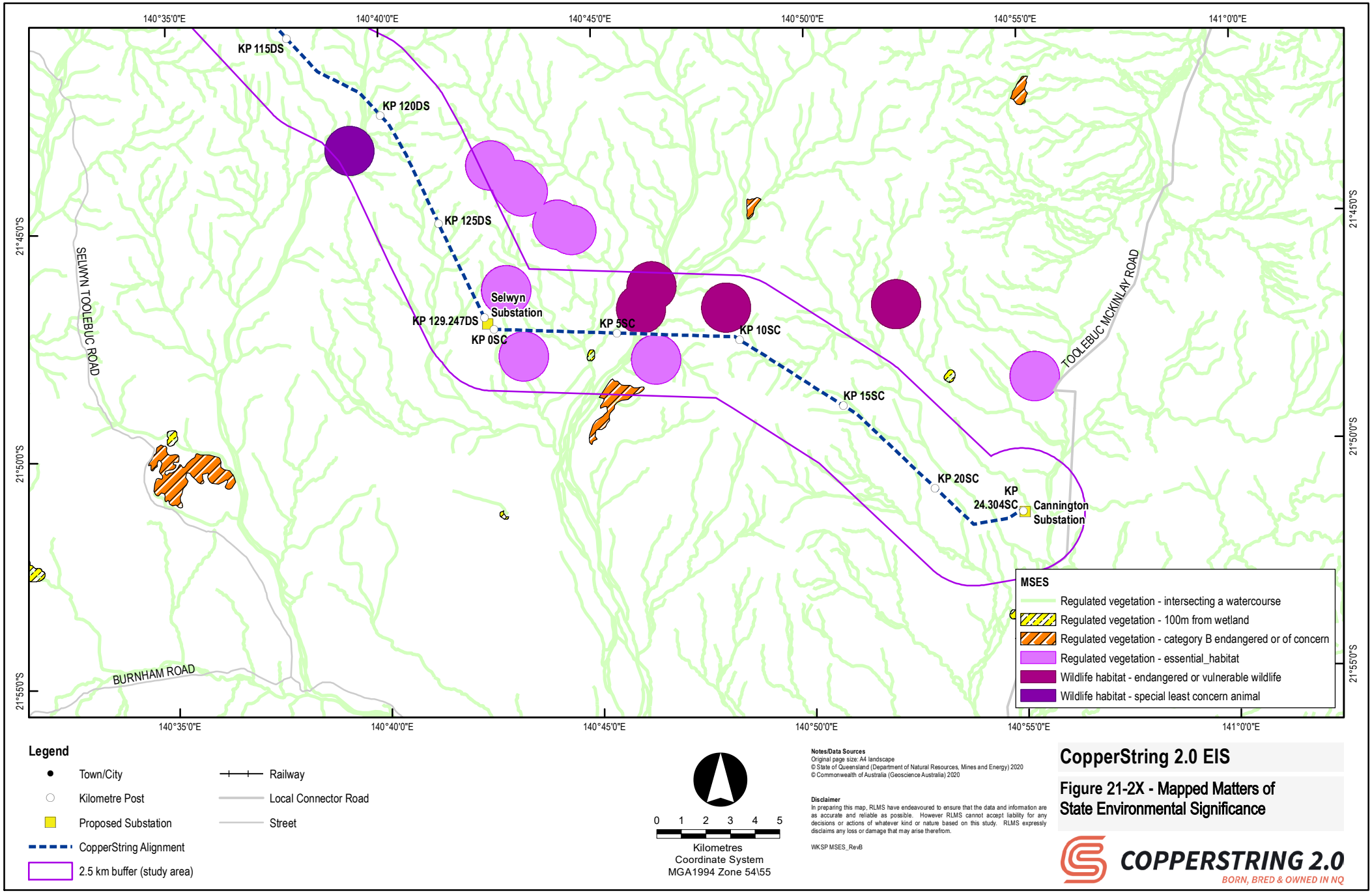
Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

WKSP MSES_RevB

CopperString 2.0 EIS

Figure 21-2W - Mapped Matters of State Environmental Significance

COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ



Legend

- Town/City
- Kilometre Post
- Proposed Substation
- CopperString Alignment
- 2.5 km buffer (study area)
- Railway
- Local Connector Road
- Street

0 1 2 3 4 5
Kilometres
Coordinate System
MGA1994 Zone 54\55

Notes/Data Sources
Original page size: A4 landscape
© State of Queensland (Department of Natural Resources, Mines and Energy) 2020
© Commonwealth of Australia (Geoscience Australia) 2020

Disclaimer
In preparing this map, RLMS have endeavoured to ensure that the data and information are as accurate and reliable as possible. However RLMS cannot accept liability for any decisions or actions of whatever kind or nature based on this study. RLMS expressly disclaims any loss or damage that may arise therefrom.

WKSP MSES_RevB

CopperString 2.0 EIS

Figure 21-2X - Mapped Matters of State Environmental Significance

COPPERSTRING 2.0
BORN, BRED & OWNED IN NQ

21.4 Project impact areas

In considering the potential Project impacts, it is important to note significant opportunity exists to avoid or minimise impacts to MNES and MSES through the siting of towers and spanning of important ecological areas. This includes specification of tower heights to increase the separation between transmission lines and vegetation, consideration of construction access and ongoing maintenance requirements.

Potential impacts have also been considered in light of the following:

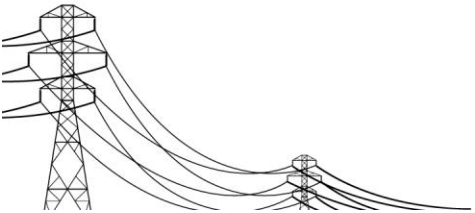
- The Project is a long and narrow linear project
- The transmission line will not create a barrier to fauna movement
- Clearing requirements for the Project will result in the loss of some habitat features. However for most species, given the linear nature of disturbance, the loss of habitat will be highly localised and is unlikely to impact the species' capacity to persist locally
- Impacts may be temporary and minor within individual areas and might not impact species presence in the landscape

Disturbance within the easement includes temporary and permanent disturbance footprints. Temporary disturbance activities include the Brake and winch sites and the Tower construction footprints. Permanent disturbance includes clearing loss for the transmission line clearance to canopy, access tracks and towers. The permanent loss of vegetation across the corridor will vary depending on the corridor section. However the permanent loss in any section is not expected to exceed 15% of the total corridor. Table 21-4 outlines the estimated clearing loss for each section of the Project.

Additional information related to the estimated clearing loss of the Project is described in Volume 1 Chapter 2 Project Description.

Table 21-4 Estimated clearing loss

Section	Length (km)	Width (km)	Area (ha)	Total Disturbance in easement (ha)	Temporary disturbance in easement (ha)	Permanent loss (% of easement)
Renewable Energy Hub	342	0.06	2052	426.53	144.89	13.73
CopperString Core	395	0.06	2370	430.87	162.85	11.31
Chumvale connections	7	0.06	42	14.76	9.61	12.27
Mount Isa Augmentation	99	0.06	594	68.30	45.83	3.78
Southern Connection	129	0.06	774	125.04	62.46	8.08
Cannington Connection	23	0.06	144	18.64	13.01	3.91
Phosphate Hill Connection	63	0.06	378	41.57	29.21	3.27



21.4.1 MNES impact areas

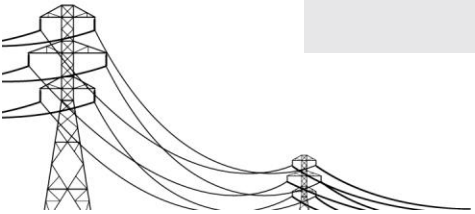
The conservation significant communities and species confirmed present or considered likely to occur within the Project area are provided in Table 21-5, including areas of mapped suitable habitat. No other MNES are impacted by the Project.

This habitat mapping has been considered for assessing potential impacts to each species, as relevant to their habitat requirements (e.g. non-breeding, breeding or foraging habitat), movements and lifecycle, and in relation to remaining suitable habitat available at the local and regional scales. Where this suitable habitat represents habitat critical to the survival of the species, or important habitat for a species, this has been specified in the ecological assessment (refer to Volume 3 Appendix N Ecological Assessment).

Table 21-5 MNES impact areas

MNES	Status	Location of suitable habitat impacted	Total habitat within Project activities (ha)
TECs			
Semi-evergreen vine thickets (SEVT) of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered under the EPBC Act	TEC located south of Project area, near KP 58-73WD	0
Flora species			
Eucalyptus raveretiana Black ironbox	Vulnerable under EPBC Act	KP 0-88WD	0.002
Livistona lanuginosa Waxy cabbage palm	Vulnerable under EPBC Act and NC Act	KP 10-233WD	2.18
Acacia crombiei Pink gidgee	Vulnerable under the EPBC Act and NC Act	KP 308-443WD	105.46
Fauna species			
Koala	Vulnerable under EPBC Act and NC Act	KP 0-208WD KP 268-333WD	97.04
Squatter pigeon	Vulnerable under EPBC Act and NC Act	KP 0-313WD	Foraging habitat: 32.54 Breeding habitat: 5.25

MNES	Status	Location of suitable habitat impacted	Total habitat within Project activities (ha)
Black-throated finch	Endangered under EPBC Act and NC Act	KP 0-313WD	290.99
Julia Creek dunnart	Vulnerable under EPBC Act and Endangered under NC Act	KP 308-704WD	107.22
White-throated needletail	Vulnerable and Migratory under EPBC Act and Special Least Concern under NC Act	KP 0-108WD	This nomadic species possesses no specialised habitat, due to its exclusively aerial nature.
Grey falcon	Vulnerable under the EPBC Act and NC Act	KP 0-28WD KP 128-504WD KP 524-634WD KP 50-100DS KP 130-1503SC KP 0-63SP	216.20
Red goshawk	Vulnerable under EPBC Act and Endangered under NC Act	KP 0-308WD	88.87
Night parrot	Endangered under EPBC Act and Endangered under NC Act	KP 674-732WD KP 0-99.15DM KP 0-129DS KP 0-24SC KP 0-63SP	62.57
Painted honeyeater	Vulnerable under EPBC Act and Vulnerable under NC Act	KP 208-248WD KP 308-353WD KP 524-554WD KP 704-736WD KP 90-99DM	661.09
Australian painted snipe	Endangered under EPBC Act and Vulnerable under NC Act	Intermittently scattered throughout: KP 0-736WD KP 0-99DM	138.63



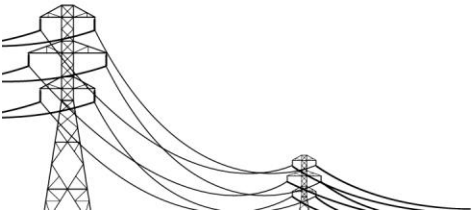
MNES	Status	Location of suitable habitat impacted	Total habitat within Project activities (ha)
		KP 0-129DS KP 0-24SC KP 0-63SP	
Plains death adder	Vulnerable under EPBC Act and Vulnerable under NC Act	KP 298-694WD	261.47
Ornamental snake	Vulnerable under EPBC Act and Vulnerable under NC Act	KP 118-228WD	34.66
Migratory species (breeding/ non-breeding habitat)			
Fork-tailed swift Latham's snipe Oriental pratincole Marsh sandpiper Wood sandpiper Glossy ibis Gull-billed tern Caspian tern	Migratory under the EPBC Act	KP 0-208WD KP 258-308WD KP 524-554WD	65.15

21.4.2 MSES impact areas

Prescribed activities and relevant MSES

Volume 1 Chapter 4 Legislation and Approvals has been referenced to identify potential or likely prescribed activities that may trigger offsets under State legislation for the Project, including:

- Taking a protected plant within the meaning of the NC Act under a protected plant clearing permit granted under the Nature Conservation (Administration) Regulation 2006, or in accordance with s15 in an area outside a protected area
  - There is the potential for a clearing permit to be required where NC Act listed flora species are directly impacted (or if clearing occurs within 100 m of a protected plant within the mapped high risk trigger area), for which a protected plant flora survey will be required to determine potential impacts and specific avoidance and mitigation measures.
- A development approval for which an environmental offset may be required under any of the following modules of the State development assessment provisions—



– State Code 16: Native vegetation clearing for the clearing activities associated with temporary infrastructure for the Project outside of the transmission corridor and outside of the infrastructure designation area.

The prescribed environmental matters that are required to be assessed for SRIs are provided in Table 21-6, as indicated in the Queensland Environmental Offsets Policy General Guide (DEHP, 2017). The calculated impact areas of these MSES are also provided.

Table 21-6 Prescribed activities and relevant MSES in Project Area

Prescribed activity	Relevant MSES	MSES present in Project area	Total habitat within Project activities (ha)	Significant Residual Impact Guideline
Taking a protected plant under a clearing permit under the NC Act	Protected wildlife habitat for flora (Schedule 2 item 6-1 and 6-2 of the EO Regulation)	Known locations of *Livistona lanuginosa*: KP 124-125 and 137-139WD High risk trigger area: KP 138-140WD	Mapped suitable habitat 2.18 ha High risk trigger area (12.1 ha intersected by Project area)	NC Act (DEHP 2014)
		Known locations of *Eucalyptus nudicaulis*: KP 89.5DM No high risk trigger area	Mapped suitable habitat 6.34 ha	NC Act (DEHP 2014)
Native vegetation clearing	Existing legally secured offset area, regulated vegetation (Schedule 2 item 2 of the EO Regulation), and connectivity areas (Schedule 2, item 3 of the EO Regulation)	Regulated vegetation – Of Concern Category B, wetland, essential habitat for EVNT species, within defined distance of a watercourse	0.56 ha Of Concern RE 30.87 ha essential habitat 0 ha regulated vegetation wetland Numerous watercourses traversed containing remnant vegetation within a defined distance of a watercourse.	Planning Act (DSDIP 2014)
		Connectivity areas	Approximately 1.79% reduction in core remnant areas (not significant)	Planning Act

Additional MSES value considerations

Native vegetation

Clearing native vegetation is regulated under the VM Act and made assessable through the Planning Act. Schedule 10 Part 3 of the Planning Regulation states that operational work that is clearing native vegetation is prohibited development, unless it is for a relevant purpose (under the VM Act s22A), exempt clearing work (under the Planning Regulation Schedule 21) or accepted development (under the VM Act Schedule 7). Where it can be demonstrated that the proposed activities are undertaken by an electricity entity or transmission entity or undertaken on a designated premises under the Planning Act, then the clearing works would be exempt and a development approval for clearing native vegetation under the Planning Act would not be required. CuString have commenced the regulatory process with the Queensland state government to be endorsed as an electricity entity under the Electricity Act and therefore clearing of native vegetation for the project may occur as exempt clearing work.

Land disturbance activities (e.g. temporary laydown areas, temporary accommodation camps) that are not within in the transmission line corridor (assessed as part of the EIS process and infrastructure designation, which will be exempt or accepted development) may require Operational Works application for clearing of native vegetation, or as included as part of a Material Change of Use application. It is proposed that any accommodation camps or construction laydown areas requiring a Material Change of Use development permit assessable under the local government planning scheme would be situated in areas without MSES present. If such development might affect MSES, the potential need for offsets would be assessed under the Planning Act.

Wetland protection area

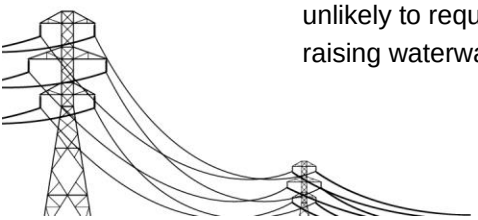
Approximately 5 ha of mapped GBR WPA trigger area is intersected by the Project area at KP 169WD, however the Project is unlikely to trigger approval for high impact earthworks in a WPA due to being electricity operating works and being likely to comply with Schedule 14 of the Planning Regulation. No works will occur within or directly adjacent to the wetland within the WPA. Therefore this aspect is not likely to trigger offset requirements.

Protected plants

There are previous records of *Acacia armitii* in proximity to the Project, which is a Near Threatened plant listed under the NC Act. The detailed design will include tower placement, higher towers and span lengths that will be effective in avoiding individual occurrences and minimising any clearing within potential habitat for the *A. armitii.* Other infrastructure areas will avoid occurrences of this species, including for temporary and permanent access, laydown and assembly areas. The Project will also undertake pre-clearance flora surveys in areas of known occurrences in order to avoid individuals. However, if an occurrence cannot be avoided, a clearing permit would be required for this species. In this case, Near Threatened plants are not MSES for this prescribed activity (taking a protected plant under a clearing permit), therefore do not trigger offset requirements.

Waterway crossings

Crossings of waterways during construction will utilise existing crossings, and crossings will not be of a type that constitute waterway barrier works. During the construction phase of the Project will utilise existing waterway crossings and where a temporary crossing is required it will be required to meet the Accepted development requirements for operational work that is constructing or raising waterway barrier works (DAF 2018). Therefore waterway crossings are unlikely to require development approval and address the State Code 18: Constructing or raising waterway barrier works in fish habitats, hence will not trigger offset requirements.



Ballara Nature Refuge

The DES have advised that there is no specific approval mechanism or authority for transmission line infrastructure traversing through a nature refuge. The Ballara Nature Refuge is structured as a conservation agreement between the landholder and the State, therefore the proponent is required to engage with the landholder and potentially apply for an amendment to the agreement. Consequently, the below prescribed activity does not apply to the Ballara Nature Refuge protected area:

- An activity conducted under an authority in a protected area under the *Nature Conservation Act 1992* (NC Act) s34, s35, s38, s42AD or s42AE, 43F, 43G or 43H

Subsequently, no offset requirements will be triggered for impacts to Ballara Nature Refuge.

For completeness, a review of the Significant Natural Resources of the Ballara Nature Refuge that are listed in the Conservation Agreement between the State of Queensland and the landholder are provided in Table 21-7, with an assessment of their relevance to the Project. The assessment concludes that, while the Project will intersect with an area of the Ballara Nature Refuge, design measures have been implemented and management measures are proposed to effectively avoid or, if avoidance is not possible, minimise impact. Subsequently, no significant impacts on the Significant Natural Resources of the Ballara Nature Refuge are likely to occur as a result of the Project.

Refer to Volume 3 Appendix N Ecological Assessment for additional information related to the Ballara Nature Refuge relevant to the Project.

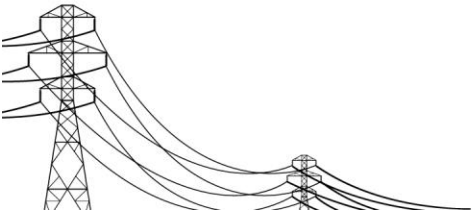
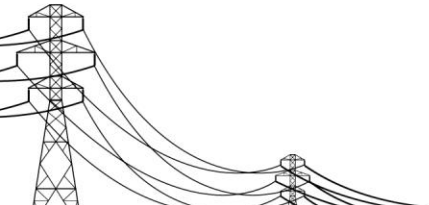
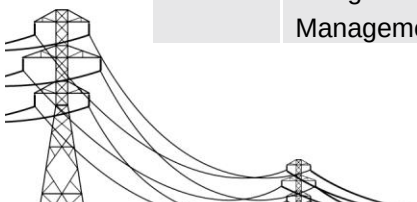


Table 21-7 Significant natural resources of the Ballara Nature Refuge

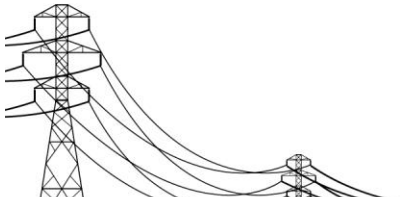
Item	Description in Conservation Agreement	Relevance to the Project
1	Presence of REs that are threatened and/or have restricted representation in protected areas*. Namely Endangered RE 1.3.7 that occurs along the majority of the creeks and riparian areas, also Of Concern REs 1.3.6, 1.5.4 and 1.5.6x2. Numerous other REs have low or no representation in protected areas. All REs in Item 1 are prone to invasion from weeds and introduced pasture plants such as buffel grass. Management conditions of highest importance: - 1c) Stock grazing is conducted on a rotational basis or at a variable rate - 1l) Minimising disturbance to wetland and riparian vegetation - 2b) Minimising the introduction, establishment and spread of pest plants and controlling existing infestations of pest plants	The RE 1.3.7 is listed as Least Concern VM Act status and Endangered Biodiversity status, and is stated in the REDD as having a medium extent in reserves. It is a fringing riparian community intersected by the corridor selection at up to four mapped locations within the nature refuge. These locations can be spanned by the transmission line and therefore avoided by the Project. RE 1.3.6 is listed as Least Concern VM Act status and No Concern at Present Biodiversity status, and is stated in the REDD as having a low extent in reserves. This RE occurs on floodplains and terraces and is intersected in numerous patches, particularly between KP 35 and 45DS. RE 1.5.4 is listed as Least Concern VM Act status and No Concern at Present Biodiversity status, and is stated in the REDD as having a low extent in reserves. This RE is intersected by the corridor selection in patches between KP 22 and 30DS. RE 1.5.6x2 is now classified as RE 1.5.16, which is listed as Least Concern VM Act status and No Concern at Present Biodiversity status, and is stated in the REDD as having no representation in reserves. RE 1.5.16 intersects the corridor selection within the nature refuge between KP 24 and 27DS. There are numerous other patches of this RE mapped within the nature refuge. The corridor selection has been selected to avoid REs listed as Of Concern or Endangered (VM Act status) wherever possible. There are two patches mapped as containing Of Concern (VM Act status) RE 1.11.7 that are intersected by the Project (these being RE 1.11.2a/1.11.8/1.11.7 at KP 30DS and RE 1.5.3/1.5.4d/1.11.7 at KP 41DS). No Endangered REs (VM Act status) are intersected by the alignment. Disturbance to wetland and riparian vegetation will be avoided, or minimised where it cannot be avoided, and the introduction and spread of pest plants will be managed during construction and operation of the Project.



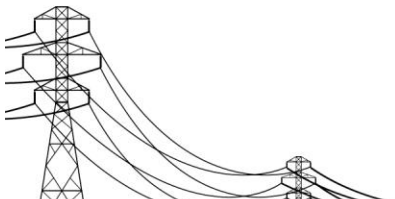
Item	Description in Conservation Agreement	Relevance to the Project
2	The Land contains a long section of the Cloncurry River and several springs including Fountain Spring and Trafalgar Spring. The springs are rare natural permanent water sources in an otherwise dry environment in the western section of the nature refuge. The Cloncurry River and the springs are significant refugia points for native fauna and perform a critical function in maintaining core populations of species during periods of drought. Management conditions of highest importance: - 1c) Stock grazing is conducted on a rotational basis or at a variable rate - 1l) Minimising disturbance to wetland and riparian vegetation - 1m) Minimising disturbance to natural water flows and processes - 1n) Minimising disturbance to the bed or banks of wetlands and watercourses by restricting machinery and vehicle use in such areas, except at established crossings - 3a) Developing and implementing fire management strategies that are appropriate to the ecosystems (including wildlife)	Within the Ballara Nature Refuge, the corridor selection intersects the Cloncurry River at one location (KP 40DS), with a number of tributaries to the Cloncurry River also intersecting the corridor selection. The transmission line will span the Cloncurry River and significant riparian corridors and will not result in waterway barrier works or other impacts to permanent or intermittent water sources. Fountain Springs and Trafalgar Springs are located approximately 22 km southwest of the Mount Isa Augmentation corridor section. No known springs are mapped within the vicinity of the Project area. Disturbance to wetland and riparian vegetation will be avoided, or minimised where it cannot be avoided. Natural water flows and processes will not be impacted by the Project. Waterway crossings will use existing crossings through the nature refuge wherever possible, and will restrict the use of machinery or vehicles in the bed and banks of wetlands or watercourses. Standard fire management strategies have been applied for the construction and operation of the Project, which take into account the potential fire hazard of the region.
3	The Land includes numerous abandoned mines and a rail line, and surrounds significant Non-Indigenous Cultural Heritage sites including cemeteries and the former township of Ballara, Hightville and Marrabah. There is historic, social, cultural and archaeological value in the mining heritage sites (former townships, cemeteries, abandoned mines, tunnels and associated infrastructure, and gem and crystal fossicking areas). Management conditions of highest importance:	The corridor selection has been designed to avoid areas of cultural heritage significance. The abandoned towns of Ballara and Hightville are located approximately 16 km south of the Mount Isa Augmentation corridor section (KP 50DM). Marrabah is approximately 7.5 km west of the study area at KP 28DS. The mining heritage sites are further assessed in Volume 2 Chapter 15 Cultural heritage of the EIS.



Item	Description in Conservation Agreement	Relevance to the Project
	- 1q) Low intensity recreational fossicking only - 4b) No Grazing Management Operations within a 100 m buffer of heritage places (Indigenous and Non-Indigenous)	
4	The Land contains large areas of intact and extremely rugged terrain remote from natural sources of water. Areas to the west of Fountain Range and along White Range are not grazed by domestic stock. These areas function in near natural condition and minimal disturbance. Management conditions of highest importance: - 3a) Developing and implementing fire management strategies that are appropriate to the ecosystems (including wildlife) - 3b) Not constructing infrastructure except where approved in this agreement or in writing by the Minister	The corridor selection does not intersect the areas to the west of Fountain Range and along White Range. No infrastructure is proposed to be built in such areas of extremely rugged terrain in near natural condition.
5	Known habitat for ghost bat (*Macroderma gigas*). The area contains known habitat for ghost bat (listed as Vulnerable). This species is considered to be under threat of decline and has sparse distribution throughout most of its range. The species roosts in abandoned mine shafts and rock fissures and is known to roost in the rail tunnel near the abandoned town of Hightville. Management conditions of highest importance: - 1e) Not damaging, destroying, marking, moving, removing, digging up or otherwise interfering with native animal habitat including roosts, caves, hollows - 1f) Avoiding interruption to breeding cycles, food sources, roosting, migration…and avoiding unnatural encouragement (direct or indirect (e.g. unsecured waste containers) feeding of native animals)	Ghost bat is listed as Vulnerable under the EPBC Act and Endangered under the NC Act. There are no known roosts sites and the species has not been previously recorded within the study area. The abandoned town of Hightville is approximately 21 km south of the Mount Isa Augmentation corridor section. The listing advice for the species describes roosting habitat as deep caves or disused mines. No suitable habitat is located within the study area. They are carnivorous, including small mammals, birds, reptiles, frogs and large insects. They may move between a number of caves seasonally or with weather conditions, therefore requiring a range of cave sites. The southern-most colony in Queensland were found to produce offspring in late spring. The Project will not impact suitable habitat for the ghost bat, or interrupt behavioural or movement patterns of the species.



Item	Description in Conservation Agreement	Relevance to the Project
6	All other Natural Resources of the Land.	Large sections of the corridor selection intersect areas of low open woodland on hills and ranges (i.e. RE 1.11.2) interspersed with areas of riparian communities and valley plains or terraces. There may be small patches of 'Of Concern' RE 1.11.7 intersected by the Project area, which can be avoided from direct impacts. However some areas mapped by DNRME regulated vegetation regional ecosystem mapping as containing RE 1.11.7 have been field-verified as not containing this RE, including within the Project area. No areas of mapped essential habitat for conservation significant species is intersected by the corridor selection. Some records of purple-necked rock wallaby occur within the study area.



Animal breeding places

High-risk or low-risk species management programs (SMPs) are likely to be required for construction of the Project for tampering with breeding places for fauna species.

There are no requirements for offsets for SMPs, however there may be requirements for impact management through translocation of breeding structures or wildlife into suitable habitat prior to or during clearing activities.

Species habitat impact areas

The conservation significant species that are MSES alone (i.e. not also MNES that are addressed in Section 21.4.1) and have mapped areas of suitable habitat intersected by the Project area are provided in Table 21-8. No prescribed activities that trigger assessment of fauna species habitat (aside from regulated vegetation essential habitat) are proposed for the Project. There is the potential for a clearing permit to be required where NC Act listed flora species are directly impacted (or clearing occurs within 100 m of *Livistona lanuginosa* within the high risk trigger area), however the Project has been assessed as unlikely to have an SRI on these flora species.

The suitable habitat mapping has been considered for assessing potential impacts to each species, as relevant to their habitat requirements (e.g. non-breeding, breeding or foraging habitat), movements and lifecycle, and in relation to remaining suitable habitat available at the local and regional scales. Where this suitable habitat represents habitat critical to the survival of the species, or important habitat for a species, this has been specified in the ecological assessment (refer to Volume 3 Appendix N Ecological Assessment).

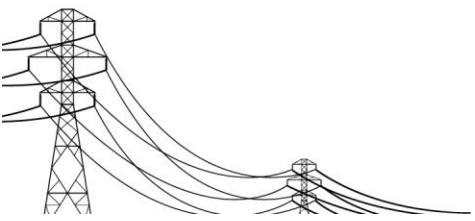


Table 21-8 MSES habitats in Project area

MNES	Status	Location of suitable habitat impacted	Total habitat within Project activities (ha)
Flora species			
Eucalyptus nudicaulis	Vulnerable under the NC Act	KP 89.5DM	105.46
Acacia armitii	Near Threatened under the NC Act	KP 178WD and 218WD	0
Fauna species			
Short-beaked echidna	Special Least Concern under the NC Act	KP 0-353WD KP 654-735.78WD KP 0-99.15DM KP 0-24.09SC KP 0-63.38SP	780.35
Purple-necked rock wallaby	Vulnerable under the NC Act	KP 664-735.78WD KP 0-99.15DM KP 0-24.09SC KP 0-63.38SP	196.63
Northern leaf-nosed bat	Vulnerable under the NC Act	KP 40-99.15DM	11.78
Common death adder	Vulnerable under the NC Act	KP 0-198WD KP 0-50SC KP 0-99.15DM	281.9
Vine thicket fine-lined slider	Vulnerable under the NC Act	KP 57-75WD	0

21.5 Significant residual impact assessment

A SRI assessment has been undertaken for MNES and MSES that have been identified and likely to be impacted within the Project area.

21.5.1 MNES communities

Offsets for MNES are only required if residual impacts (those remaining after all measures to avoid, mitigate and minimise are applied) are significant as defined in the *Matters of National Environmental Significance - Significant impact guidelines 1.1* (DoE 2013). The potential Project impact areas for relevant Threatened Ecological Communities are provided in Table 21-5.

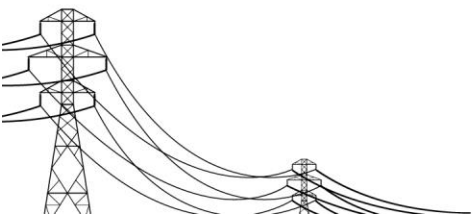
The *Semi-evergreen vine thickets (SEVT) of the Brigalow Belt (North and South) and Nandewar Bioregions* that was confirmed present within the study area was assessed under the *Matters of National Environmental Significance - Significant impact guidelines 1.1* (DoE 2013) as **unlikely** to be significantly impacted by the Project as it will be avoided (the relevant significant impact assessments are shown in Volume 3 Appendix N Ecological Assessment).

21.5.2 MNES species

Offsets for MNES are only required if residual impacts (those remaining after all measures to avoid, mitigate and minimise are applied) are significant as defined in the *Matters of National Environmental Significance - Significant impact guidelines 1.1* (DoE 2013). The potential Project impact areas for relevant MNES species are provided in Table 21-5.

The MNES species confirmed present or considered likely to occur within the Project area were assessed under the *Matters of National Environmental Significance - Significant impact guidelines 1.1* (DoE 2013) as **unlikely** to be significantly impacted by the Project (the relevant significant impact assessments are shown in Volume 3 Appendix N Ecological Assessment). The species assessed as unlikely to be significantly impacted include:

- Conservation significant flora species*:*
  - *Eucalyptus raveretiana* (black ironbox)
  - *Livistona lanuginosa* (waxy cabbage palm)
  - *Acacia crombiei* (pink gidgee)
- Conservation significant fauna species:
  - *Phascolarctos cinereus* (koala)
  - *Geophaps scripta scripta* (squatter pigeon (southern))
  - *Poephila cincta cincta* (southern black-throated finch)
  - *Sminthopsis douglasi* (Julia Creek dunnart)
  - *Hirundapus caudacutus* (white-throated needletail) (also a listed migratory species)
  - *Falco hypoleucos* (grey falcon)
  - *Erythrotriorchis radiatus* (red goshawk)
  - *Pezoporus occidentalis* (night parrot)
  - *Grantiella picta* (painted honeyeater)
  - *Rostratula australis* (Australian painted-snipe)
  - *Acanthophis hawkei* (plains death adder)
  - *Denisonia maculata* (ornamental snake)



- Migratory species:
  - A*pus pacificus* (fork-tailed swift)
  - *Gallinago hardwickii* (Latham's snipe)
  - *Gelochelidon nilotica* (gull-billed tern)
  - *Glareola maldivarum* (oriental pratincole)
  - *Hirundapus caudacutus* (white-throated needletail) (also a listed threatened species)
  - *Hydroprogne caspia* (Caspian tern)
  - *Plegadis falcinellus* (Glossy ibis)
  - *Tringa glareola* (wood sandpiper)
  - *Tringa stagnatilis* (marsh sandpiper)

A summary of the outcomes of the assessment of significant impacts on MNES flora and fauna is summarised in Table 21-9.

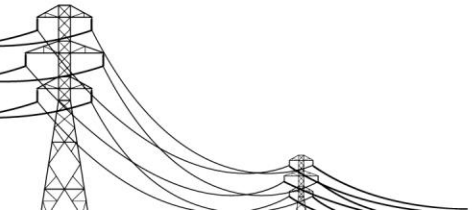
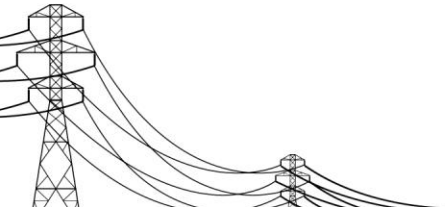
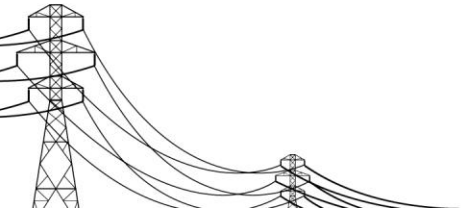


Table 21-9 Summary of significant impacts on MNES species

Species	Significant impact criteria								
	Lead to a long-term population decrease	Reduce the area of occupancy of an important population	Fragment an existing important population	Adversely affect habitat critical to the species survival	Disrupt the breeding cycle	Impact the species habitat	Introduce invasive species	Introduce disease that may cause the species to decline	Interfere substantially with the recovery of the species
Flora									
Eucalyptus raveretiana	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Livistona lanuginosa	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Acacia crombiei	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Fauna									
Squatter pigeon	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Koala	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Black-throated finch	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Julia Creek dunnart	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
White-throated needletail	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Red goshawk	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Grey falcon	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Night parrot	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely



Species	Significant impact criteria								
	Lead to a long-term population decrease	Reduce the area of occupancy of an important population	Fragment an existing important population	Adversely affect habitat critical to the species survival	Disrupt the breeding cycle	Impact the species habitat	Introduce invasive species	Introduce disease that may cause the species to decline	Interfere substantially with the recovery of the species
Painted honeyeater	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Australia painted snipe	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Plains death adder	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Ornamental snake	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely



21.5.3 MSES species

This section assesses the significance of the Projects' impacts on MSES that have been confirmed present or considered likely to occur within the Project area (excluding species that have been included in the assessment as MNES in Section 21.5.1).

Offsets for MSES conservation significant flora and fauna species and regulated vegetation and connectivity areas are only required if residual impacts are significant as defined in the Queensland Significant Residual Impact Guidelines (DEHP 2014). The potential Project impact areas for relevant MSES are provided in Table 21-8.

All conservation significant flora and fauna species (MSES) confirmed present or considered likely to occur within the Project area were assessed under the Queensland Significant Residual Impact Guidelines (DEHP 2014) as **unlikely** to be significantly impacted by the Project (the relevant SRI assessments are shown in Volume 3 Appendix N Ecological Assessment). These species include:

- Conservation significant flora species*:*
  - *Eucalyptus nudicaulis*
  - *Acacia armitii*
- Conservation significant fauna species:
  - *Petrogale purpureicollis* (purple-necked rock-wallaby)
  - *Tachyglossus aculeatus* (short-beaked echidna)
  - *Hipposideros semoni* (northern leaf-nosed bat)
  - *Acanthophis antarcticus* (common death adder)
  - *Lerista cinerea* (vine thicket fine-lined slider)

A summary of the outcomes of the assessment of significant impacts on MSES species is summarised in Table 21-10.

It should be noted that if clearing occurs within 100 m of a *Livistona lanuginosa* individual within the mapped high risk trigger area, a clearing permit is required to be obtained. However it is unlikely that a SRI would result from such clearing, where no protected plants are likely to be directly or indirectly impacted.

Table 21-10 Summary of significant impact outcomes on MSES species

Species	Significant impact criteria							
	Lead to a long-term population decrease	Reduce the extent of occupancy	Fragment an existing population	Result in genetically distinct populations forming	Introduce invasive species	Introduce disease that may cause the species to decline	Interfere with the recovery of the species	Disruption to ecologically significant locations
Flora								
Eucalyptus nudicaulis	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Acacia armitii	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Fauna								
Purple-necked rock-wallaby	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Short-beaked echidna	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Northern leaf-nosed bat	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Vine thicket fine-lined slider	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely

21.5.4 MSES regulated vegetation

A SRI assessment was undertaken for relevant MSES regulated vegetation in accordance with applicable SRI guideline criteria under the Planning Act to determine the likelihood of significant residual impact for each matter and subsequently, whether offset obligations would be required.

A summary of the likelihood of significant residual impact on relevant MSES regulated vegetation and connectivity areas is provided in Table 21-11.

Table 21-11 Summary of regulated vegetation and connectivity areas significant impact assessment

MSES	Significant
Regulated vegetation	
Endangered RE	Unlikely
Of Concern RE	Unlikely
Remnant vegetation within a defined distance of a watercourse	Unlikely
Remnant vegetation intersecting a wetland	Unlikely
RE an area of essential habitat for Endangered or Vulnerable wildlife	**Potential**
Connectivity areas	
RE containing remnant vegetation required for ecosystem functioning	Unlikely

The SRI assessments are provided in the following sections.

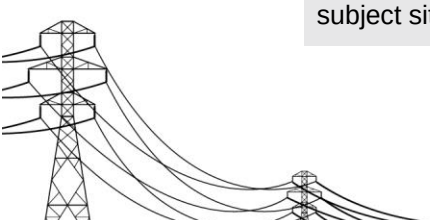
Of Concern regional ecosystem

An assessment against the Significant Residual Impact Guidelines (DSDIP 2014) with regards to Of Concern RE was undertaken and identified that a SRI has potential to occur. This assessment is provided in Table 21-12.

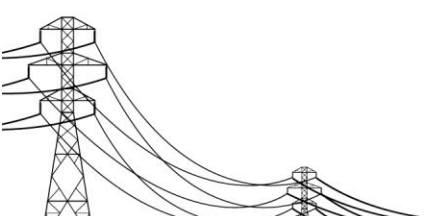
Table 21-12 SRI assessment - Of Concern RE

SRI criteria	Assessment
LIKELY to have an SRI:	
Clearing of more than 5 ha of Endangered or Of Concern RE vegetation OR	Unlikely The estimated disturbance of the Project on mapped Of Concern Re is approximately 0.56 The mixed polygons where one element is an Of Concern RE will be ground-truthed prior to finalising the design and location of towers and spanned areas in order to avoid or minimise clearing within the Of Concern REs. The Of Concern elements are all mapped as comprising less than 10% of the overall mixed polygons. No Endangered RE will be impacted by the Project.
Clearing that results in an overall area (not confined to property boundaries) of Endangered or Of	Unlikely The Of Concern RE 1.11.7 is a low, sparse woodland on hills and ranges, of which much of the low canopy vegetation can be

SRI criteria	Assessment
Concern RE vegetation of less than 5 ha OR	spanned across and potentially avoided with appropriate siting of access tracks and towers and span lengths. The Of Concern RE 2.3.43 is a grassland community on alluvial plains that will require very little clearing of vegetation in order to construct the Project. The mixed polygons where one element is an Of Concern RE will be ground-truthed prior to finalising the design and location of towers and spanned areas in order to avoid or minimise clearing within the Of Concern REs. The Of Concern elements are all mapped as comprising less than 10% of the overall mixed polygons. No Endangered RE will be impacted by the Project.
Clearing that results in the physical separation of Endangered and Of Concern RE communities within and on adjoining sites (physical separation refers to any clearing that would result in the separation of an otherwise intact area of vegetation)	Unlikely The Of Concern RE 1.11.7 is a low, sparse woodland on hills and ranges, of which much of the low canopy vegetation can be spanned across and potentially avoided with appropriate siting of towers and span lengths. The Of Concern RE 2.3.43 is a grassland community on alluvial plains that will require very little clearing of vegetation in order to construct the Project. The mixed polygons where one element is an Of Concern RE will be ground-truthed prior to finalising the design and location of towers and spanned areas in order to avoid or minimise clearing within the Of Concern REs. The Of Concern elements are all mapped as comprising less than 10% of the overall mixed polygons. No Endangered RE will be impacted by the Project.
UNLIKELY to have an SRI:	
Lineal clearing (that is for a purpose under s22A of the VM Act) within Endangered or Of Concern REs not exceeding the width and area thresholds specified in Table 1, State Development Assessment Provisions (SDAP) State Code 16 by more than 25%; where an equivalent area which can be mapped as Endangered or Of Concern in the future is being rehabilitated on the subject site OR	Not applicable



SRI criteria	Assessment
Thresholds are provided in the below Table 21-13.	
Clearing of less than 10% of the total mapped area of Endangered or Of Concern REs intersecting the property boundaries of the project, if total clearing is under 5 ha; and where an equivalent area which can be mapped as Endangered or Of Concern in the future, is rehabilitated through other locations on the subject site OR	Not applicable
Clearing of Endangered or Of Concern REs not exceeding the width thresholds specified in Table 1, SDAP State Code 16 by more than 100% or the area threshold by 50%; where rehabilitated on the subject site OR Thresholds are provided in the below Table 21-13.	Not applicable
Clearing of Endangered or Of Concern REs within width thresholds specified in Table 1, SDAP State Code 16 and not exceeding the area threshold by more than 50%, to a maximum area of 5 ha OR Thresholds are provided in the below Table 21-13.	Complies Of Concern RE 1.11.7 is a sparse structure category, therefore the width threshold of 20 m and area threshold of 2 ha applies. Of Concern RE 2.3.43 is a grassland structure category, therefore the width threshold of 25 m and area threshold of 5 ha applies. Clearing of both Of Concern REs will not exceed these thresholds. Mapped Of Concern REs will be ground-truthed prior to finalising the design and siting of towers with the aim of avoiding or minimising clearing widths and areas to meet these criteria.



SRI criteria	Assessment
Removal of up to 5% of the total mapped area of Endangered REs intersecting the property boundaries of the project, where not greater than 25 m in width; for the purposes of removing fragments, patches, uneven edges or protruding vegetation OR	Not applicable
Removal of up to 10% of the total mapped area of Of Concern RE intersecting the property boundaries of the project, where not greater than 50 m in width; for the purposes of removing fragments, patches, uneven edges or protruding vegetation OR	Not applicable
Clearing of Endangered or Of Concern vegetation that is equivalent in size/area to existing exempt clearing to be protected via the proposal (i.e. realignment of a boundary which results in a shorter length of exempt clearing through an existing Endangered or Of Concern area than allowed via the existing boundary) OR	Not applicable
Clearing of REs less than 1.1 ha in size where surrounding land uses are zoned for urban purposes or future urban purposes under a local planning instrument.	Not applicable

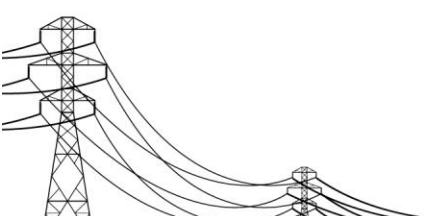


Table 21-13 RE width and area thresholds (State Code 16, Table 16.3.1)

Structure category	Width (m)	Area (ha)
Dense and mid-dense*	10	0.5
Sparse and very sparse*	20	2
Grassland*	25	5

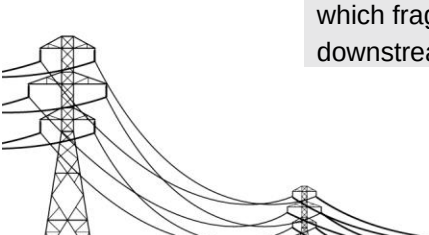
* As per structure category in the Regional Ecosystem Description Database (Queensland Herbarium, 2019)

Remnant vegetation within defined distance of a watercourse

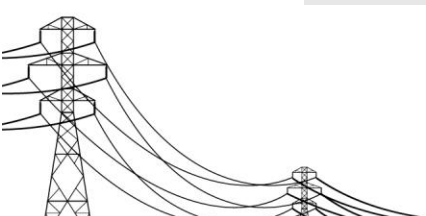
An assessment against the Significant Residual Impact Guidelines (DSDIP 2014) with regards to remnant vegetation within defined distance of a watercourse was undertaken and identified that a SRI has potential to occur. This assessment is provided in Table 21-14.

Table 21-14 SRI assessment – within defined distance of a watercourse

SRI criteria	Assessment
LIKELY to have an SRI:	
Permanent removal of vegetation within the defined distance of a stream order 2 or higher where no rehabilitation is proposed OR	Unlikely The Project will avoid clearing within riparian vegetation in all areas apart from access tracks where no alternative crossing exists. Permanent removal of remnant vegetation within 10 m of a watercourse will be avoided by the Project or, where necessary for access, will be rehabilitated in accordance with the Concept Rehabilitation Plan (Volume 3 Chapter 18). Higher stream orders that are frequently flowing will aim to use existing crossings. Within the Project area, transmission towers will not be constructed within the high banks of waterways, other than where it cannot be avoided (especially within large braided ephemeral systems wider than 500 m). Clearing of vegetation to establish vehicle access across a watercourse shall not occur within 10 m of the defining high bank of a watercourse and access tracks will be a maximum of 7 m wide and developed through a combination of vehicle compaction or minor grading. Where watercourse bed level crossings are required, existing crossings will be utilised, as agreed with the property owner. Rehabilitation of cleared areas adjacent to watercourses will be undertaken as soon as practicable after clearing.
Building of an online detention basin greater than 1 ha in size or other similar works that result in the clearing of vegetation which fragments up and downstream remnant	Not applicable



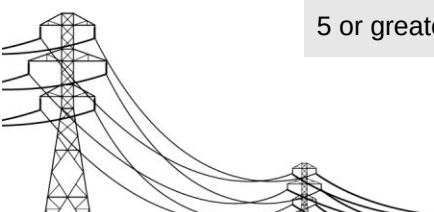
SRI criteria	Assessment
areas on any stream order OR	
Permanent clearing of more than 0.5 ha of an Endangered or Of Concern RE, within the defined distance of a watercourse	Unlikely Of Concern RE 2.3.43 occurs on a braided channel system mapped with numerous braided regulated vegetation watercourses. The Of Concern RE is a grassland community that is a minor component of the overall mapped polygon. The Project will place towers and access tracks/waterway crossings outside of the onsite Of Concern community, if present along the corridor selection, and outside of 10 m width for the mapped watercourses. While there is potentially 0.56 ha of Of Concern RE 2.3.43 intersected by the Project area, pre-clearance surveys will ground-truth the occurrence of this community to enable avoidance of impacts. Of Concern RE 1.11.7 does not occur along a mapped regulated vegetation watercourse.
UNLIKELY to have an SRI:	
Lineal clearing of vegetation (that is for a purpose under s22A of the VM Act) less than 25 m in width on a stream order 1 or 2 mapped watercourse, where the works include: i. revegetation of exposed embankment areas (e.g. from a new road crossing and culvert installation) in accordance with a vegetation management or rehabilitation plan ii. temporary erosion and sediment control until construction is completed or stream banks have been stabilised AND iii. a crossing design which can be demonstrated (through a site specific study or similar) not to interfere with existing aquatic and	Potential Within the Project area, transmission towers will not be constructed within the high banks of waterways, other than where it cannot be avoided (especially within large braided ephemeral systems wider than 500 m). Clearing of vegetation to establish vehicle access across a watercourse shall not occur within 10 m of the defining high bank of a watercourse and access tracks will be a maximum of 7 m wide and developed through a combination of vehicle compaction or minor grading. Where watercourse bed level crossings are required, existing crossings will be utilised, as agreed with the property owner. Rehabilitation of cleared areas adjacent to watercourses will be undertaken as soon as practicable after clearing.



SRI criteria	Assessment
terrestrial habitat of the watercourse, OR	
Temporary clearing of 'least concern' RE of up to 1 ha on a stream order 1 or 2 where erosion and sediment measures are in place and the area is to be rehabilitated on the subject site OR	Potential in some areas As per above description.
Removal of vegetation from a partially vegetated / degraded stream order 1 or 2 where revegetation greater than the area removed occurs on other stream order areas within or adjoining the site OR	Potential in some areas As per above description.
Clearing of 'least concern' RE not containing Essential Habitat up to 1 ha for lineal infrastructure (e.g. roads and rail) OR	Not applicable
Removal of understorey vegetation of up to 3 ha within a remnant area (excluding clearing within the high bank of the watercourse) for the purposes of open space or safety where not removing any trees with a trunk Diameter at Breast Height (DBH) greater than 150 mm in diameter	Not applicable

Table 21-15 Distance from defining banks of watercourses and drainage features (State Code 16, Table 16.3.2)

Stream order	Distance from defining bank (m)
1 or 2	10
3 or 4	25
5 or greater	50

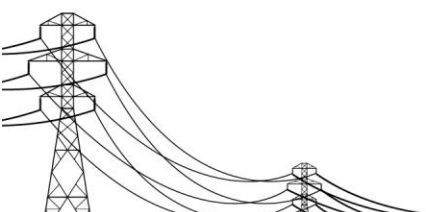


Remnant vegetation intersecting a wetland

An assessment against the Significant Residual Impact Guidelines (DSDIP 2014) with regards to remnant vegetation intersecting a wetland was undertaken and identified that a SRI is unlikely to occur. This assessment is provided in Table 21-16.

Table 21-16 SRI assessment – wetland RE

Significant residual impact criteria	Assessment
LIKELY to have an SRI:	
Clearing within the defining banks of a defined wetland area exceeding the thresholds specified in Table 2, SDAP State Code 16 OR Thresholds are provided in Table 21-15.	Unlikely No regulated vegetation wetlands will be impacted by the Project area.
Clearing involving the permanent removal of more than 25% of the vegetation located within 50 m of the defining bank of a defined wetland OR	Unlikely Areas within 50 m of regulated vegetation wetlands will be primarily avoided by Project clearing impacts. Where avoidance is not possible, the area will be rehabilitated in accordance with the Concept Rehabilitation Plan (Volume 3 Chapter 18).
Clearing involving the permanent removal of more than 50% of the vegetation located between 50 m and 100 m of the defining bank of a defined wetland	Unlikely Areas within 100 m of regulated vegetation wetlands will be primarily avoided by Project clearing impacts. Where avoidance is not possible, the area will be rehabilitated in accordance with the Concept Rehabilitation Plan (Volume 3 Chapter 18).
UNLIKELY to have an SRI (include low risk activities outside of the wetland area – not surrounding buffer areas):	
Lineal clearing (that is for a purpose under s22A of the VM Act) within 25% of the area and width thresholds in Table 1, SDAP State Code 16 where the cleared area is proposed for rehabilitation OR Thresholds are provided in Table 21-13.	Unlikely As per above description.
Clearing of vegetation not exceeding the width thresholds specified in Table 1, SDAP State Code 16 by more than 100%; where the overall area threshold is not exceeded OR Thresholds are provided in Table 21-13.	Unlikely As per above description.



Significant residual impact criteria	Assessment
Lineal clearing (that is for a purpose under s22A of the VM Act) that does not exceed the width thresholds specified in Table 1, SDAP State Code 16 and does not exceed the area threshold by more than 50% OR Thresholds are provided in Table 21-13.	Unlikely As per above description.
Clearing that is not within 50 m of the defining bank of a wetland and does not exceed the width thresholds specified in Table 1, SDAP State Code 16 by more than 100% or the area threshold by 50%, where the cleared area is proposed to be rehabilitated OR Thresholds are provided in Table 21-13.	Unlikely As per above description.
Clearing of less than 2 ha and not within 50 m of the defining bank of a wetland for low impact open space uses where other management measures (e.g. erosion and sediment control etc.) are included to achieve any of the relevant performance outcomes of SDAP State Code 16 OR	Unlikely As per above description.
Clearing for any lineal infrastructure (e.g. roads and rail) not greater than 50 m in width, which results in the permanent removal of less than 25% of the vegetation located within 50 m of the defining bank of a wetland and where management plans are demonstrated to achieve the performance outcome of SDAP State Code 16 OR	Unlikely As per above description.
Clearing within 100 m of a wetland where it can be demonstrated the vegetation type is not associated with the wetland (e.g. separated by topography / catchments or other physical barriers.	Not applicable

Essential habitat

An assessment against the Significant Residual Impact Guidelines (DSDIP 2014) with regards to essential habitat was undertaken and identified that a SRI has potential to occur. This assessment is provided in Table 21-17.

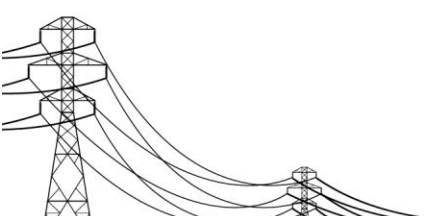
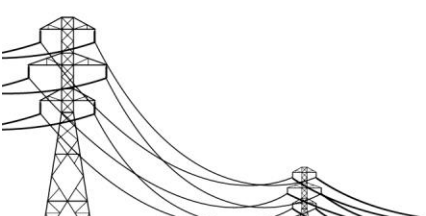


Table 21-17 SRI assessment – essential habitat

Significant residual impact criteria	Assessment
LIKELY to have an SRI:	
Clearing of essential habitat exceeding the thresholds specified in Table 1, SDAP State Code 16, and resulting in a greater than 10% permanent reduction in the extent of essential habitat mapped on site. Thresholds are provided in Table 21-13.	Potential There is approximately 205.78 ha of mapped essential habitat intersected by the Project area. Some of these areas contain value for the species they are mapped for; however, as they are a buffer of a previous record, some mapped areas will not contain values for the species they are mapped for. Where there is a flora species occurrence along a riparian corridor, no clearing will occur and no access tracks will be planned in proximity to those habitat areas, therefore Project activity areas for those habitat areas have been listed as 0 ha of disturbance. This is the case for *Livistona lanuginosa*. Disturbance within the easement includes temporary and permanent disturbance footprints. Temporary disturbance activities include the Brake and winch sites and the Tower construction footprints. Permanent disturbance includes clearing loss for the transmission line clearance to canopy, access tracks and towers. The permanent loss of vegetation across the corridor will vary depending on the corridor section. However the permanent loss in any section is not expected to exceed 15% of the total corridor (which would reduce the disturbance area of essential habitat to 30.87 ha as a maximum). Where this essential habitat is based on riparian corridors or gilgai landforms that will be spanned by the transmission line (such as in known occurrences of waxy cabbage palm and gilgai habitat for ornamental snake), the area of essential habitat cleared will be minimised in those habitats. Also in areas of high terrain, such as habitat for purple-necked rock wallaby, the transmission line will be designed to span across much of the vegetation. In grassland communities that are habitat for Julia Creek dunnart, there will be minimal or no vegetation clearing.



Significant residual impact criteria	Assessment
UNLIKELY to have an SRI:	
Lineal clearing (that is for a purpose under s22A of the VM Act) within essential habitat not exceeding the width and area thresholds specified in Table 1, SDAP State Code 16 by more than 25%, and where an equivalent area which can be mapped as essential habitat in the future is rehabilitated on the subject site OR Thresholds are provided in Table 21-13.	Not applicable
Clearing of less than 10% of the total mapped areas of essential habitat on-site; where the remaining 90% is protected through a legally binding agreement (or similar) in order to maintain ecosystem function (e.g. to continue to support the species for which the essential habitat is derived) OR	Not applicable
Temporary clearing of essential habitat vegetation not exceeding the width thresholds specified in Table 1, SDAP State Code 16 by more than 100% or the area threshold by more than 50%; where cleared essential habitat vegetation is rehabilitated, on the subject site OR Thresholds are provided in Table 21-13.	Not applicable
Clearing of essential habitat vegetation complying with the width thresholds specified in Table 1, SDAP State Code 16 and exceeding the area threshold by less than 50% OR Thresholds are provided in Table 21-13.	Potential As per description above.
Removal of essential habitat vegetation exceeding the width and area thresholds specified in Table 1, SDAP State Code 16 and where through the remapping of other vegetation the site results in an increase in the extent of mapped essential habitat vegetation OR Thresholds are provided in Table 21-13.	Not applicable

Significant residual impact criteria	Assessment
Removal of fragmented or isolated areas of essential habitat where the equivalent area of essential habitat can be added to a larger retained vegetated area displaying the same essential habitat factors, by revegetation	Not applicable

21.5.5 Connectivity areas

The Performance Outcome 16 of State Code 16 requires that:

> *'In consideration of vegetation on the land subject to the development application and on adjacent land, sufficient vegetation is retained to maintain ecological processes and remains in the landscape despite threatening processes'*

The DES Landscape Fragmentation and Connectivity Tool was used to determine potential impacts on connectivity as a result of the Project. The outcome is that the Project is not predicted to have a significant residual impact on connectivity.

Although the Project will result in localised losses of habitat to allow for the construction, most of the infrastructure footprint, such as offices, construction compounds and laydown areas are proposed in areas of non-remnant vegetation.

A summary of the Landscape Fragmentation and Connectivity Tool assessment is provided in Table 21-18.

Table 21-18 Summary of Landscape Fragmentation and Connectivity Tool – connectivity areas

Landscape Fragmentation and Connectivity Tool parameter	Output
Significance test one	
Area of remnant core vegetation at the local scale (pre impact)	962,913.72 ha
Area of remnant core vegetation at the local scale (post impact)	945,698.52 ha
Percent change of core at the local scale (post impact)	1.79 %
Significance test two	
The number of core remnant areas occurring on the site	7
The number of core remnant areas remaining on the site post impact	7
Result	
This analysis has determined any impact on connectivity areas is NOT significant	

21.6 Offsets Strategy

21.6.1 Offset triggers

No significant residual impacts to MNES are considered likely to occur as a result of the Project, therefore no offset requirements under the EPBC Act are anticipated to be required.

The MSES that have potential for offset requirements to be triggered are:

- Regulated vegetation (prescribed matters of Of Concern RE, remnant vegetation within the defined distance of a watercourse, and/or essential habitat for EVNT species):
  - Unless the Project is demonstrated to be undertaken by an electricity entity under the Electricity Act and therefore clearing of native vegetation for the project can occur as exempt clearing work
- Wildlife habitat for protected plants:
  - Only if pre-clearance surveys identify occurrences where impacts cannot be avoided, and a clearing permit is required to be obtained, and significant residual impacts are then assessed as likely to result
  - Not including Near Threatened species *Acacia armitii*

21.6.2 Type of offset

A proponent may elect to deliver an offset under the EO Act by three methods:

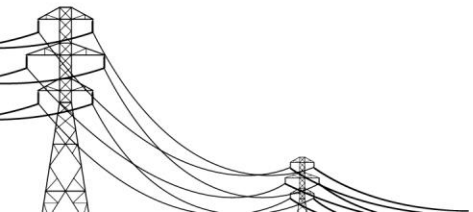
- Proponent-driven offset (land based)
- Financial settlement offset
- Combination of proponent-driven and financial settlement offsets.

Proponent-driven offset (land based)

Proponent-driven offsets are delivered by, or on behalf of the proponent. This can include delivery of the offset by a third party through a contract between the proponent and an offset provider. Under this option the liability for delivering the offset remains with the proponent as part of their obligation to deliver the requirements of the offset conditions.

A land-based offset is characterised by a parcel of land being managed to provide a conservation outcome for impacted matters. Land-based offsets may be provided for an impact on any MSES.

Under the EO Act, MSES offset requirements may be fulfilled through a combination of proponent-driven offsets and financial settlement. While the proportion of proponent-driven and financial settlements is more variable within the Queensland Impact Site Assessment Tool, this method is effective and can account for limitations such as land availability and in cases where landholder agreements are not achievable. The Queensland Impact Site Assessment Tool uses a maximum ratio of 1:4 to ensure the requirement to deliver a conservation outcome is met; i.e. the land-based offset required is up to four times the size of the area impacted. This is to facilitate a gain in ‘habitat quality’ suitable to compensate for the loss of ‘habitat quality’ at the impact site, to achieve a conservation outcome for the impacted matters.



Legal securing

There are a number of mechanisms by which CuString Pty Ltd can legally secure and manage suitable offset sites for the Project, the most appropriate of which will be determined by the specific characteristics of the selected site/s and the management actions required so that offset obligations are achieved.

There are three constituents to the legally securing process:

- Acquisition (land dealings) strategy
- Securing mechanism
- Management strategy

Offset sites are to be legally secured and managed in such a way to protect the relevant offset matter. The most appropriate course of action will be determined following outcomes of field surveys to consider the environmental values and land use of candidate sites, landholder discussions, and government consultation.

Two initial options to secure offset sites are those of an outright purchase or entry into a legally binding agreement with a landholder whereby managing the offset area(s) would be the responsibility of either CuString Pty Ltd or the landowner, with CuString Pty Ltd responsible for ensuring compliance with regulatory conditions.

Voluntary Declaration

A voluntary declaration (VDec) is an available option to secure the offset areas. A VDec is an option under the VM Act that provides a simplified, streamlined process for landholders to voluntarily protect areas of native vegetation not otherwise protected by the VM Act. A VDec can be used to protect areas of high nature conservation values (or areas vulnerable to land degradation), and to secure areas of land to satisfy statutory offset requirements.

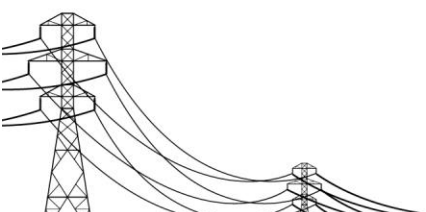
The proponent will follow the process outlined in the *Guide to Voluntary Declarations under the Vegetation Management Act 1999 (effective 21 June 2019)* to obtain the VDec, which is summarised below.

A Request for a voluntary declaration application is submitted to the Queensland Department of Natural Resources, Mines and Energy (DNRME), including written consent from all registered owners, a description of the purpose of the VDec and how the area meets the criteria of high nature conservation value, and a copy of the offset area management plan.

DNRME will assess the VDec request to ensure it meets all criteria required and to ensure the management plan contains the appropriate elements to ensure the declared area is managed to achieve the desired outcomes.

Once DNRME is satisfied that the VDec request meets the criteria for a declaration, a VDec offer will be sent that includes a draft:

- Declaration notice
- Declared area code (if proposed)
- Property Map of Assessable Vegetation (PMAV) showing the area as Category A vegetation, giving it a high level of protection similar to Endangered regional ecosystems within a Category B area
- Declared area management plan, including map of the declared area.



Once DNRME and the proponent agree to the offer, DNRME will make the declaration and provide a finalised VDec package. The declaration takes effect from the date the chief executive signs the declaration notice. The offset area management plan has effect under the VDec process from the same date. The VDec will be applied over the offset areas in perpetuity.

There are no statutory timeframes for the VDec application and approval process.

Financial

In accordance with the Impact Site Assessment Tool under the EO Act offsets, financial settlement offsets acquit the offset obligation by making a payment in accordance with the Qld Policy. Once the amount has been paid, the offset obligation has been met.

If a land-based offset is not available to fully acquit the Commonwealth and State offset obligations, CuString Pty Ltd may pursue, financial settlement and other compensatory measures in combination with land-based offsets, particularly for MSES offsets.

Combination

A combination of proponent-driven and financial settlement offsets may also be applied to adequately achieve offset requirements for relevant MSES.

While the proportion of proponent-driven and financial settlements is more variable within the Queensland Impact Site Assessment Tool, this method is effective and can account for limitations such as land availability and in cases where landholder agreements are not achievable.

21.6.3 Potential offset obligations

Table 21-19 summarises potential offset calculation estimates for MSES regulated vegetation with SRI related to the Project, in accordance with the Impact Site Assessment Tool (including both financial settlement and site assessment estimates).

If individuals of a protected plant species (likely to be either *Livistona lanuginosa* or *Eucalyptus nudicaulis*) cannot be avoided from disturbance, and the Project triggers a clearing permit and a SRI, an offset may be required at a x4 multiplier of wildlife habitat area.

However, considering the proposed avoidance strategies to occur during pre-clearance design and siting of infrastructure, these SRI are anticipate to be deemed as unlikely.

Table 21-19 Impact Site Assessment Tool offset calculation estimate

MSES regulated vegetation	Maximum area of disturbance (ha)	Notional offset area (ha)	Notional financial settlement
An area of essential habitat for Endangered, Vulnerable or Near Threatened wildlife	30.87 (based on maximum of 15% of corridor disturbance of 205.78 ha)	123.48	$304,025

Assumptions made for inputs to the Impact Site Assessment Tool include:

- Assumptions of area represent a worst-cast scenario, using the maximum estimated disturbance area, while the significant residual impact area is likely to be substantially less

- Essential habitat has been calculated based on the total area however using only the inputs for purple-necked rock wallaby within Cloncurry Shire Council area (Northwest Highlands Bioregion), although essential habitat for other species is mapped within the Project area in other bioregions
- The offset calculations have not assumed co-location of offset areas, which is likely to be the case where more than one MSES has an SRI

Available offset land

If offsets are triggered for regulated vegetation and/or protected plants, these may be able to be co-located on the same land and/or same offset areas.

Once impact areas are further defined through pre-clearance surveys to field-verify areas to avoid, a desktop assessment will be undertaken to identify areas of potential value as offset sites that are adjacent or in close proximity to the Project area.

Following identification using desktop mapping and databases, and agreement by landholders, field assessments of impact areas and proposed offset areas would be undertaken. Field assessments (and associated desktop assessments) would be in accordance with the Guide to determining terrestrial habitat quality (DES 2020).

Field assessments would also identify potential requirements for management and monitoring of proposed offset areas in order to maintain or improve the habitat quality onsite.

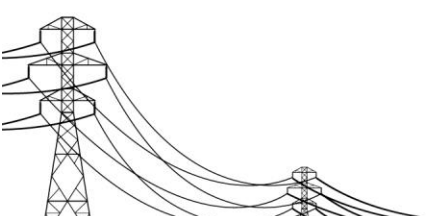
An Offset Management Plan would then be developed that described the existing characteristics of the offset areas and the proposed management and monitoring programs, in accordance with approval conditions, requirements for legally securing, and with consideration of the relevant recovery and threat abatement plans.

21.6.4 Compliance with Queensland Offsets Policy

The Qld Policy states that an environmental offset must meet the following seven offset principles:

- Offsets will not replace or undermine existing environmental standards or regulatory requirements, or be used to allow development in areas otherwise prohibited through legislation or policy
- Environmental impacts must first be avoided, then minimised, before considering the use of offsets for any remaining impact
- Offsets must achieve a conservation outcome that achieves an equivalent environmental outcome
- Offsets must provide environmental values as similar as possible to those being lost
- Offset provision must minimise the time-lag between the impact and delivery of the offset
- Offsets must provide additional protection to environmental values at risk, or additional management actions to improve environmental values
- Where legal security is required, offsets must be legally secured for the duration of the impact on the prescribed environmental matter.

The proposed offset and Offset Management Plan will be delivered with the aim of meeting the above Qld Policy principles.



21.7 Conclusion

21.7.1 Overall outcomes

The MNES that were confirmed present or likely to occur included one TEC (*Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions*), 15 listed threatened species, and nine listed migratory species. Offsets for MNES are only required if residual impacts (those remaining after all measures to avoid, mitigate and minimise are applied) are significant as defined in the *Matters of National Environmental Significance - Significant impact guidelines 1.1* (DoE 2013).

The residual impact on the MNES was assessed as **unlikely** to be significant (the relevant significant impact assessments are shown in Volume 3 Appendix N Ecological Assessment).

Therefore no potential offset requirements under the EPBC Act are anticipated for the Project.

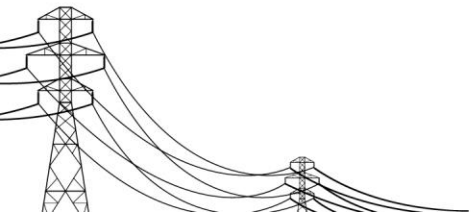
The likely prescribed activities that may trigger offsets under State legislation for the Project, including:

- Taking a protected plant within the meaning of the NC Act under a protected plant clearing permit granted under the Nature Conservation (Administration) Regulation 2006, or in accordance with s15 in an area outside a protected area
  - Assessment of an SRI for protected plants wildlife habitat would be triggered
  - However, where occurrences of protected plants can be avoided, and a clearing permit is not required, offsets would not be triggered
  - If clearing occurs within 100 m of the occurrences of *Livistona lanuginosa* in the mapped high risk trigger area, a clearing permit would be required, however an SRI would be unlikely where individuals are not directly or indirectly impacts, therefore offsets would not be triggered
- State Code 16: Native vegetation clearing for the clearing activities associated with temporary infrastructure for the Project outside of the transmission corridor and outside of the infrastructure designation area.
  - Assessment of an SRI for regulated vegetation and connectivity areas would be triggered
  - However, where it can be demonstrated that the proposed activities are undertaken by an electricity entity or transmission entity or undertaken on a designated premises under the Planning Act, then the clearing works would be exempt and a development approval for clearing native vegetation under the Planning Act would not be required.

All conservation significant flora and fauna species (MSES) confirmed present or considered likely to occur within the Project area were assessed under the Queensland Significant Residual Impact Guidelines (DEHP 2014) as unlikely to be significantly impacted by the Project (the relevant SRI assessments are shown in Volume 3 Appendix N Ecological Assessment).

A SRI assessment was undertaken for relevant MSES regulated vegetation and connectivity areas in accordance with applicable SRI guideline criteria under the Planning Act to determine the likelihood of a SRI for each matter and subsequently, whether offset obligations would be required. This assessment determined that there is potential for a SRI for Of Concern REs, remnant vegetation within a defined distance of a watercourse and essential habitat.

Final impact areas will be further refined through pre-clearance surveys to identify areas to avoid. With consideration of the proposed avoidance strategies to occur during pre-clearance design and siting of infrastructure, these SRIs are anticipated to be deemed as unlikely.



If offsets are deemed to be required following the design phase, further desktop and field assessments will be undertaken to identify potential offset areas which have been identified in proximity to the Project area. Accordingly, an Offset Management Plan would be developed.

21.7.2 Response to Terms of Reference

In addressing the Terms of Reference, the following responses are provided:

12.27 Identify whether the Project will result in a significant residual impact on MSES, requiring an offset with reference to the Queensland Environmental Offsets Policy and Significant Residual Impact Guideline 2014 (see Appendix 1) and the Queensland Environmental Offsets framework:

- Potential SRI to regulated vegetation matters, including Of Concern REs, remnant vegetation within the defined distance of a regulated vegetation watercourse and essential habitat; however the Project is considered to be exempt under the Planning Regulation 2017 for operational works that is clearing native vegetation undertaken within the designated infrastructure easement for the transmission line. Other Project infrastructure areas will be located outside of these MSES areas.

12.148 The MNES chapter must include an assessment of the likelihood of residual significant impacts occurring on listed threatened species and communities, and listed migratory species after avoidance, mitigation and management measures relating to the Project have been applied. If it is determined that a residual significant impact is likely, include a draft Offset Management Strategy (as an appendix to the EIS) that provides, at a minimum:

(f) details of the mechanism to legally secure the environmental offset/s (under Queensland legislation or equivalent) to provide protection for the offset area/s against development incompatible with conservation.

- Section 6 outlines the proposed process for securing land for offsets should they be required, being subject to landholder agreement.

The Terms of Reference (ToR) matters dealing with MNES are not applicable.