CopperString 2.0

Cumulative impacts

Volume 2 Chapter 20

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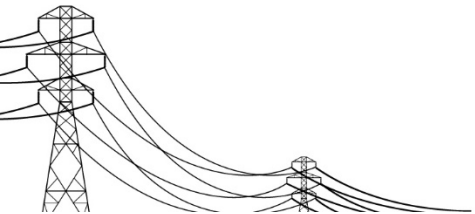


20. Cumulative impacts

20.1 Introduction

20.1.1 Project overview

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.

The CopperString transmission network is divided into the following eight sections as shown in Figure 20-1:

1. Woodstock Substation
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).

20.1.2 Purpose of chapter

The purpose of this chapter is to access the impacts of the CopperString Project cumulatively with those of other proposed projects which may have a similar duration and spatial boundary relevant to that environmental value.

This cumulative impact assessment chapter was prepared in accordance with the Terms of Reference (ToR) for the Project. A table that cross-references the contents of this chapter and the ToR is included as Volume 3 Appendix A Terms of reference with cross-reference table.

In accordance with the ToR, residual (mitigated risks) impacts with the potential to interact with other projects and thereby having a potential cumulative impact has also been discussed within other chapters of this Environmental Impact Station (EIS). These were included as follows:

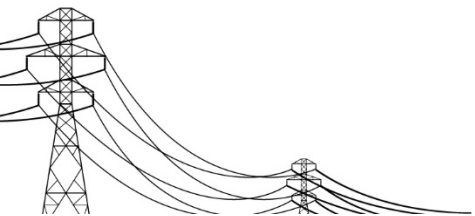
- Volume 2 Chapter 14 Social
- Volume 2 Chapter 16 Economics
- Volume 2 Chapter 17 Hazards, health and safety
- Volume 2 Chapter 18 Matters of national environmental significance.

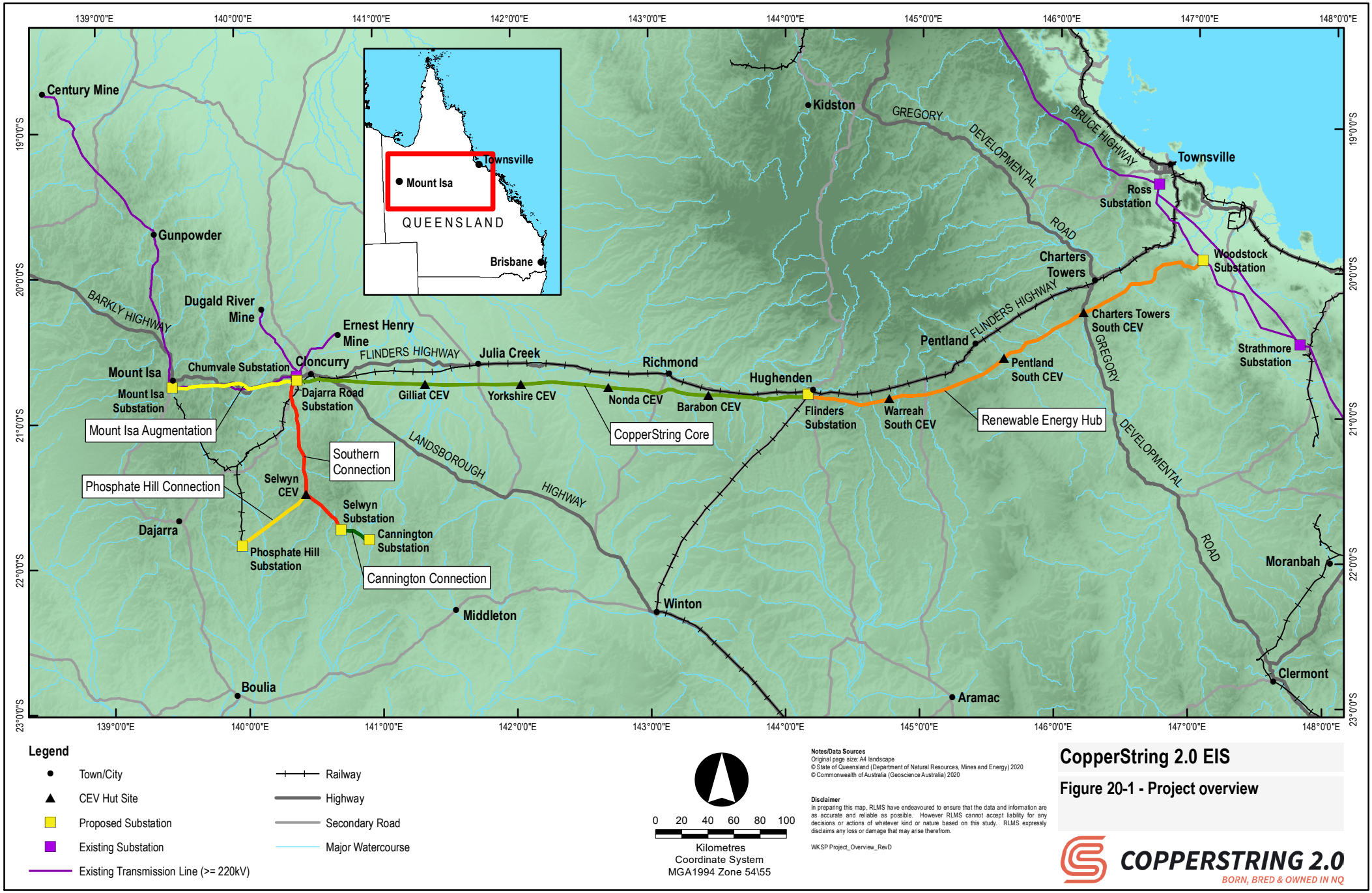
20.1.3 Defined terms

The following are a list of defined terms utilised throughout this chapter.

- ‘The Project’ – means the CopperString 2.0 EIS Project
- ‘CuString’ – means CuString Pty Ltd, the proponent

- ‘Corridor selection’ – means 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 Selwyn to Phosphate Hill and 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.
- ‘Study area’ – means the study area defined specifically for this chapter of the EIS, included in Section 20.2.1.





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
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WKSP Project_Overview_RevD

CopperString 2.0 EIS

Figure 20-1 - Project overview

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20.2 Methodology

20.2.1 Study area

For the purpose of this cumulative assessment, spatial boundaries have been defined for each environmental value to identify if the project is contributing to a cumulative impact. The spatial boundaries vary and do include areas within and outside of the seven local government areas (LGAs) through which the corridor selection traverses, with the addition of Townsville City Council via which major deliveries and staging will occur. Refer to Figure 20-2.

20.2.2 Data sources

The following data sources were used as part of this assessment:

- Publically available information regarding proposed projects such as environmental impact statements and project websites.
- Coordinated projects map (Department of State Development, Tourism and Innovation 2020).
- Queensland's major mineral, coal and petroleum operations and resources map (Department of Natural Resources, Mines and Energy (DNRME) 2019).

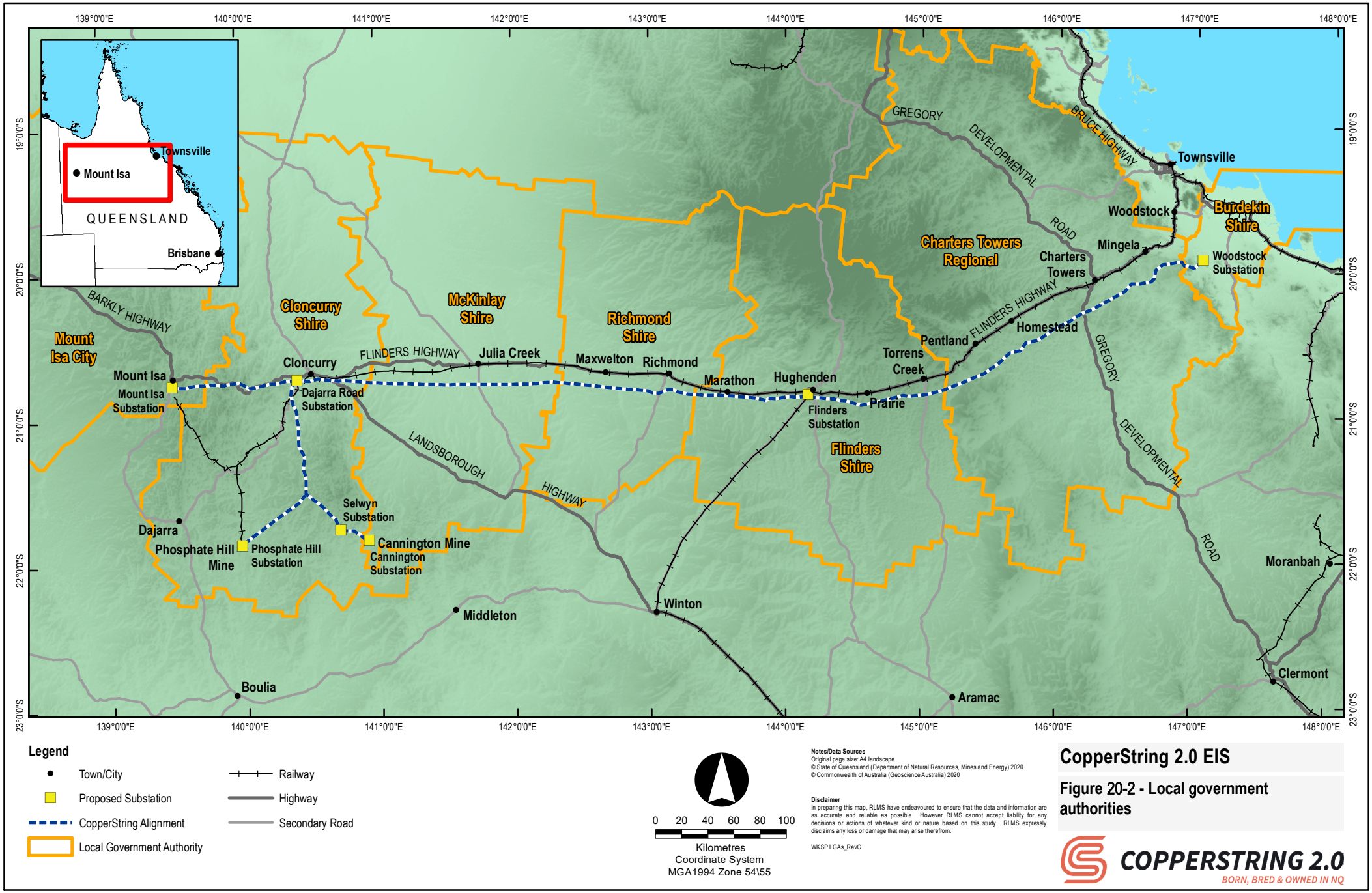
This cumulative impact assessment draws on the findings from other assessments conducted as part of the EIS for the Project, including:

Volume 2

- Chapter 5. Land
- Chapter 6. Geology and soils
- Chapter 7. Flora and fauna
- Chapter 8. Biosecurity
- Chapter 9. Water resources and water quality
- Chapter 10. Air and greenhouse gas
- Chapter 11. Noise and vibration
- Chapter 12. Waste management
- Chapter 13. Transport
- Chapter 14. Social
- Chapter 15. Cultural heritage
- Chapter 16. Economic
- Chapter 17. Hazards, health and safety
- Chapter 18. Matters of national environmental significance

Volume 3

- Appendix O. Visual Amenity



Legend

- Town/City
- Proposed Substation
- CopperString Alignment
- Local Government Authority
- Railway
- Highway
- Secondary Road

0 20 40 60 80 100

Kilometres

Coordinate System
MGA1994 Zone 54\55

Notes/Data Sources
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WKSP LGAs_RevC

CopperString 2.0 EIS

Figure 20-2 - Local government authorities

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20.2.3 Legislative context and standards

The legislation relevant to this cumulative impact assessment is as follows:

- *Environment Protection and Biodiversity Conservation Action 1999* (EPBC Act)
- *State Development and Public Works Organisation Act 1971* (SDPWO Act).

In the absence of standard or legislated guidelines in Queensland, the cumulative impact assessment made reference to the following publication:

- Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (Walker and Johnston 1999), prepared for the European Commissions.

Guidelines for the Assessment of Indirect and Cumulative Impacts (Walker and Johnston 1999) provides guidance on setting spatial and temporal boundaries for assessment and considering the magnitude and significance of impacts.

20.2.4 Assessment method

The scope of this cumulative impact assessment was defined by the following tasks:

- Identification of proposed projects within the public realm
- Review of project descriptions of proposed projects
- Review of residual impacts of the Project
- Screening of residual impacts for their potential to interact with other impacts
- Review of environmental assessments of the proposed projects
- Prediction of the scale and magnitude of the cumulative impacts.

The identification of current and proposed projects included a review of the coordinated projects map (DSDTI 2020), Queensland's major mineral, coal and petroleum operations and resources map (DNRME 2019), in addition to projects identified as part of the strategic blueprint for Queensland's North West Mineral Province (NWMP) and those promoted by the Mount Isa to Townsville Economic Zone (MITEZ).

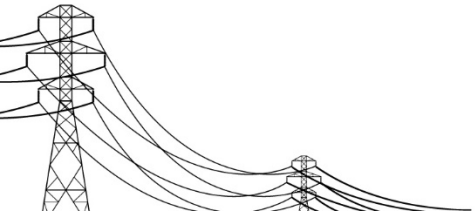
It is considered that this method would capture current projects (those for which environmental approval has been granted but not yet commenced works) and proposed projects (those which are undergoing or proposed to undergo environmental assessment) of the scale, duration and spatial boundary relevant to this cumulative impact assessment. Publications on proposed projects were reviewed in order to physically describe the projects and their associated activities. The current and proposed projects identified here are listed in Section 20.3.2.

20.3 Existing environment

20.3.1 Assessment of relevant Projects

The assessment approach centred on the identification and qualitative evaluation of affected environmental values in association with the Project. The values and potential effects considered in this assessment are highlighted in Table 20-1. The following factors were considered for each potential impact on a Natural environmental or built environmental value:

- magnitude of the impact
- spatial extent of the impact.
- duration of the impact.



Residual impacts were then screened, and any with a spatial extent which did not intersect another project, had a short term duration or minor intensity were not considered further (refer to Section 20.4.1). This methodology was employed due to the preliminary level of information available from the majority of listed projects which are still in the feasibility investigations. The limited information available was generally sourced from internet sources and other information in the public domain.

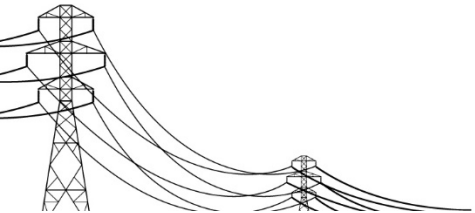


Table 20-1 Environmental values assessed through the cumulative assessment

Natural environmental and built environmental value	Main effects considered	Spatial boundary of cumulative impact	Duration of cumulative impact
Land use	Loss of rural grazing land productivity, accessibility and soil quality.	Property boundary of the impacted landholder	Approximately 2 years during construction
Geology and soils	Erosion and soil stabilisation.	Property boundary of the impacted landholder	Approximately 2 years during construction
Air quality and Greenhouse gas (GHG)	Localised odours and dust emissions GHG emissions.	Within 2 km of the Project area National	Approximately 2 years during construction
Noise and vibration	Localised noise impacts.	Within 2 km of the Project area	Approximately 2 years during construction
Cultural Heritage	Local effects on Indigenous and non-Indigenous cultural heritage.	Disturbed areas associated with construction of the Project area	Project lifespan
Flora and fauna	Habitats, breeding or feeding places of endangered, rare or threatened plant or animal species.	Within the bioregion	Project lifespan
Biosecurity	Spread of pest plants and animals.	Local Government Area	Project lifespan
Water quality and water resources	Decrease in surface water and groundwater quality through water abstraction for construction uses.	Within the sub-catchment	Approximately 2 years during construction
Traffic	Increased use and degradation of transport volumes and routes.	State Controlled Roads Local Government Roads Private Roads Air and Sea transportation networks	Approximately 2 years during construction

Natural environmental and built environmental value	Main effects considered	Spatial boundary of cumulative impact	Duration of cumulative impact
Social and Economic values	Health and safety, amenity and economic benefits. Demand for skilled labour and opportunity for local business to provide goods and services for the Project.	Corridor selection Local Government Areas	Approximately 2 years during construction
Waste	Use of natural resources, energy and associated waste generation and impacts to the capacity of existing facilities.	Local Government Areas	Approximately 2 years during construction

20.3.2 Description of cumulative impact projects

A summary of the identified Projects considered for this assessment is provided below in Table 20-2. These projects were identified due to their location in relation to the Project, potential conflict for resources, or project schedule.

An attempt was made to assess impacts over the life-cycle of individual projects listed in Table 20-2. However, where data in relation to the intensity or duration of impacts from the other projects was not available or incomplete, assumptions based on likely values from other similar scale projects was utilised. Whilst the decommissioning of the Project could introduce additional or differing cumulative impacts particularly on social values through, for example, the potential loss of the economic benefits, these have not been assessed since the timeline for decommissioning would fall at the end of the Project's 45 year life.

Figure 20-3 and Table 20-3 also identify a number of other projects within the region which were also of relevance to the Project. These projects were identified as having broader regional significance within the EIS, particularly for studies including Transport and Social cumulative impacts.

Table 20-2 Overview of projects

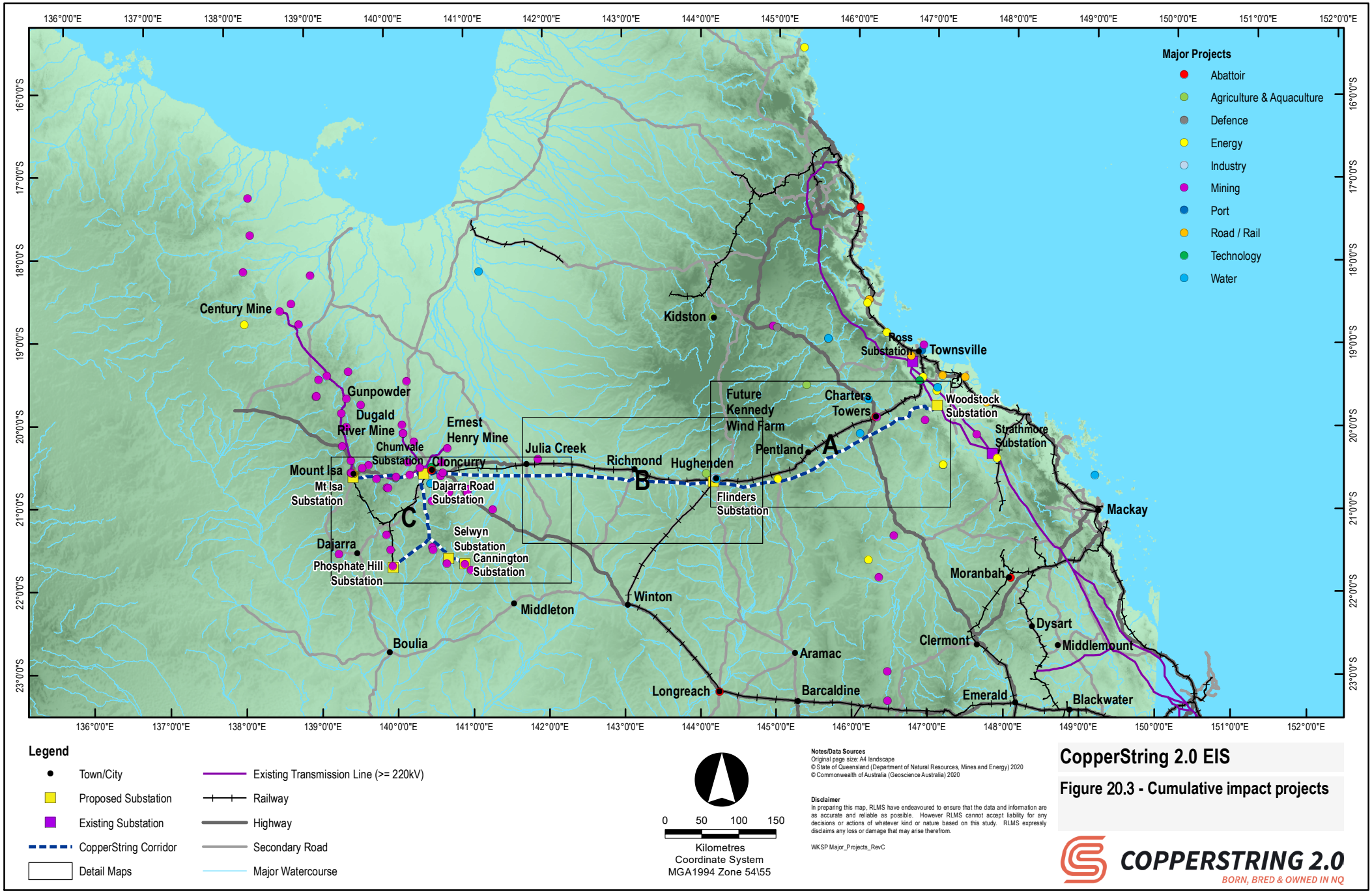
Existing and proposed projects	Activity	Location	Major impacts	Timing and Status
Townsville Port Expansion	Increase Port capacity	Townsville	Demand on skilled labour and resources	Under development
Hells Gate Dam and Irrigation Project (including Big Rocks Weir)	Dam construction and waterway diversions	Townsville	Demand on skilled labour and resources; alterations to surface water flows and resources; construction noise.	Business case funding approved.[1]
15 Mile Irrigated Agricultural Development Project	Irrigated agricultural development	Hughenden	Demand on skilled labour and resources; alterations to surface water resources;	Expected completion in 2020
Kennedy Energy Park (Windlab)	Development of a renewable energy precinct to be connected to the Project	Kennedy	Demand on skilled labour and resources; Climate	Construction completed. Awaiting application to Australian Energy Market Operator

[1] Townsville Enterprise (2020) Hells Gate Dam Project. Available from: https://www.townsvilleenterprise.com.au/key-projects/hells-gate-dam-project/

Existing and proposed projects	Activity	Location	Major impacts	Timing and Status
Unmanned Aerial Vehicle testing facility	Establish a world-class commercial common-user drone testing facility.	Cloncurry Airport	Demand on skilled labour and resources; increased noise emissions in vicinity of airfield	Construction expected May 2020 with completion by October 2020[2]
Hughenden Industrial Estate	Under development by a variety of enterprises	Hughenden	Demand on skilled labour and resources; Traffic	Under development. Stage 2 expansion planned
Hughenden Beef Processing Facility	A new meatworks and 50,000 head feedlot	Hughenden	Demand on skilled labour and resources; noise and odour emissions, increased transport demand	Planned to be operational in 2022
Mount Colin (Round Oak)	Exploration works for expansion of mining project	Cloncurry	Demand on skilled labour and resources	Exploration to continue until August 2022
Northern Outback Meat Processing studies (MITEZ[3])	Evaluating the commercial viability of a Northern Outback Queensland meat processing facility	Cloncurry	Demand on skilled labour and resources; noise and odour emissions, increased transport demand	Unknown – feasibility study completed

[2] Department of State Development, Tourism and Innovation (2020) Unmanned aerial systems. Available from: https://www.statedevelopment.qld.gov.au/industry/priority-industries/aerospace/unmanned-aerial-systems.html

[3] MITEZ Economic Development (2015) Northern Outback Queensland Meat Processing facilities. Available from: http://www.mitez.com.au/cpt_projects/northern-outback-queensland-meat-processing-studies/



Legend

- Town/City
- Proposed Substation
- Existing Substation
- CopperString Corridor
- Detail Maps
- Existing Transmission Line (>= 220kV)
- Railway
- Highway
- Secondary Road
- Major Watercourse

0 50 100 150

Kilometres

Coordinate System
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Figure 20.3 - Cumulative impact projects

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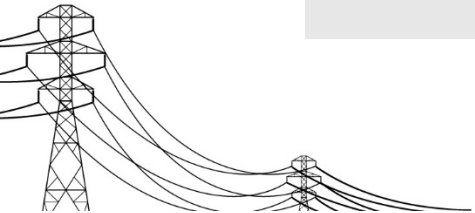
Table 20-3 Cumulative impact projects

Industry	Project
Mining	Alpha Coal Project
	Galilee Coal Project (Northern Export Facility)
	Carmichael Coal Mine and Rail
	China Stone Coal Project
	Capricorn Copper Mine Refurbishment and Restart Project
	Ravenswood Expansion Project
	Sconi Project
	Mt Elliot
	Merlin Molybdenum-Rhenium Phase 2
	Cannington Expansion
	Roseby Copper (Little Eva)
	Charters Towers
	Copper Mountain Mining, Cloncurry, Queensland, copper
	Citigold Corp, Charter Towers expansion, Queensland, gold
	Evolution Mining, Mt Carlton, Queensland, gold
	Walford Creek
	Lady Annie
	Tick Hill
	Osborne, Kulthor, Selwyn, Mt Dore
	Cloncurry Copper Project
	Mt Colin
	Barbara
	Rocklands
	Eloise
	Milo
	Millenium
	Kalman, Jubilee, Elaine, Overlander, Mt Philp
	Gilded Rose
	Westmoreland
	Leichhardt Project
	Dugald River
	Isa Copper Smelter, Mount Isa Copper, George Fisher
	Mount Isa Zinc
	George Fisher, Handlebar Hill
	Ernest Henry
	Lady Loretta
	Valhalla, Odin, Skal, Bikini, Mirrioola
	Duke Batman
	Andersons
	Honey Pot
	Watta Hills, Warwai
	Mt Oxide
	Constance Range
	White Range
	Mt Norma
	Phosphate Hill
	Century
	Lorena
	AusMes Mining Group - Mt Freda

Industry	Project
	Mary Kathleen
	Korella
	Mount Dromedary
	Maronan - Pb/Ag/Cu/Au
	Pegmont
	Wee MacGregor
	Eloise JV, Altia
	Quamby (Assuming Quamby Queen Mine)
	Ardmore
	Bluebush
	Trekelano
	Paradise South
	Kamarga - Paperback Project incl. JB Prospect
	Barr Creek (D8)
	St Elmo
Agriculture and Aquaculture	15 Mile Irrigated Agricultural Development project
	Agripower Fertiliser Expansion Project
	Guthalungra Aquaculture Project
	Stage 1 of Cloncurry's Bio-fuels and Waste Treatment Precinct
Energy	Kidston Pumped Storage Hydro project
	Kidston Project
	North Queensland Power Station (assumed to be located near Collinsville)
	Kennedy Energy Park Stage 1 (Wind 40MW, Solar 15MW)
	Clare Solar Farm Project (100MW)
	Rollingstone Solar Farm (110 MW)
	Haughton Solar Farm 100MW
	Majors Creek Solar Project 400MW
	Archer Point Wind Farm 120MW
	Ingham Bio-Energy Project (110MW)
	Burdekin Falls - Hydro-Electric Power Station (50MW)
	Northern Gas Pipeline– Opportunity/Impact Study
Technology	Unmanned Aerial Vehicle Test, Trial and Evaluation Facility and Flight Range at Cloncurry
Road / Rail	Sarina to Cairns - Haughton River & Pink Lily Lagoon Upgrade
	Sarina to Cairns - Ingham to Cardwell Range Deviation
	Townsville Ringroad stage 5
	Bruce Highway - Burdekin Deviation
	Bruce Highway - Ingham to Cardwell Range Deviation
	Sarina to Cairns - Saltwater Creek Upgrade
	North Coast Line Capacity (Brisbane to Cairns)
	Commercial & Industrial Transport & Logistics Facility for Regional NWQ – Feasibility Study
Defence	Singapore Force Posture Initiatives - Townsville
Water	Three Rivers Irrigation Project
	Haughton Pipeline Duplication
	Burdekin Falls Dam - Saddle Dam and Monolith Improvement
	Hells Gate Dam - Upper Burdekin
	Hells Gate Diversion Canal - 240km from Hells Gates to a Delineated Area, 30 km SW of Charters Towers



Industry	Project
	Options for additional water storage for Mount Isa/ Cloncurry
	O'Connell Creek Water Storage & Irrigation Project
	Haughton Pipeline Duplication (current and Stage 2)
	Big rocks weir
	Hells gate dam
	Cave Hill dam
	Hughenden Recreational Lake
Abattoir	Northern Outback Queensland Meat Processing Studies
	Hughenden Beef Processing plant (abattoir / meatworks)
Port	Townsville Port Expansion Project
Industry	Hughenden Industrial Estate
	Lansdown Industrial Precinct

20.4 Potential impacts and mitigation measures

20.4.1 Potential Cumulative impacts

The following sections identify potential impacts and mitigation measures for each environmental value identified in Table 20-1. The impact levels are inclusive of the implementation of any mitigation measures described in Section 20.4.2.

Table 20-4 provides an overview of the natural environmental and built environmental values which are likely to contribute to a cumulative impact as a result of the Project. An assessment of each value is discussed below in relation to the contribution of the Project to cumulative impacts.

Table 20-4 Cumulative impacts requiring assessment

Natural environmental and built environmental values	Cumulative impact	
	Construction	Operation
Land use	×	×
Geology and soils	×	×
Air quality and GHG	×	×
Noise and vibration	×	×
Cultural Heritage	×	×
Flora and fauna	✓	✓
Biosecurity	✓	×
Water resources and water quality	×	×
Traffic	✓	×
Social values	×	×
Waste	✓	×

Land

The loss of agricultural land underlies all of the projects reviewed in this study. Both the Project and other relevant projects will impact on large tracts of land, however the land impacted by the

Project will not be sterilised for agricultural purposes following completion of construction. Construction activities have the greatest potential for impact given the greater disturbance area, although, these impacts can be minimised by liaising/negotiating with the relevant stakeholders and shortening the duration of construction.

Operational land use impacts are expected to be manageable through maintaining activities within the Project area. Once construction is complete the easement and any access tracks will be available to landholders and livestock for use, which may not be the case for other relevant projects with long lifespans and permanent impact footprints.

No cumulative impacts during construction or operation.

Geology and soils

Many soils in the study area are susceptible to varying types of erosion. The impact from the Project on soil quality is localised and as such the cumulative impact on this parameter is expected to be low.

No cumulative impacts during construction or operation.

Flora and fauna (including matters of national environmental significance)

A detailed assessment of the cumulative impacts on flora and fauna is difficult given the level of information available is limited. The greatest cumulative impact of the identified projects is the potential loss of habitat and greater impact to species listed under the *Vegetation Management Act 1990* and the *Environment Protection and Biodiversity Conservation Act 1999*. Consequently, due to a lack of specific available data on the impacts from other projects, the extent of specific habitat loss was not possible to define.

To avoid significant cumulative impacts to flora and fauna values all project proponents would need to adopt the proposed Project approach to avoid areas of conservation or ecological significance where practical to do so. Each proponent of other projects considered in this assessment will be required to provide offsets in accordance with Commonwealth and State policies for unavoidable impacts on potential habitat.

Potential for cumulative impacts during construction or operation.

Biosecurity

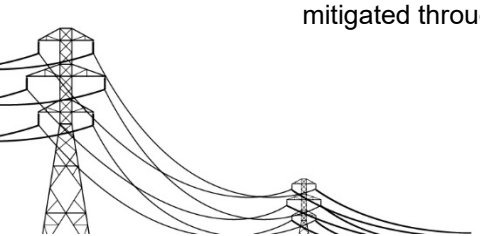
The greatest risk associated with invasive plants and animals for the Project is the increased opportunity for invasive plant infestation and resultant negative impacts to biodiversity and loss of land productivity. There is also a high risk that increased clearing of vegetation and transport activities could facilitate invasive plant infestations.

The construction phase has the greatest potential for impact. Activities associated with the construction phase that have greater potential for impact include the transport of materials and living in construction camps. All activities involving transport have the capacity to transfer invasive plants, including pre-construction site visit and operating activities. Construction camps can attract a range of invasive animals which can be transferred to construction locations with personnel and equipment movements.

Potential for cumulative impacts during construction only.

Water resources and water quality

The likelihood of measurable impacts of the proposed Project on the water resources is low. Most of the impacts are identified to occur during the construction phase, which can be mitigated through implementation of mitigation measures.



Given that the identified impacts are insignificant, residual impacts are then inexistent. Residual impacts can be considered as those that remain significant following application of the mitigation measures. It is, however, acknowledged that increased stormwater generation will remain as a negative impact (even though it is low) as a result of construction of substations. The Project has limited potential to impact on groundwater.

No cumulative impacts during construction or operation.

Air quality and GHG

The main impacts from the Project are from dust produced from disturbed land. Disturbance areas associated with the Project are limited to that required for easements, tower footprints, access tracks, CEV huts, laydown areas, and substations. Individually these are relatively small and localised in comparison to the larger development projects including, dams, mines and industrial areas.

The placement of concrete batching plants at laydown areas should consider the proximity of sensitive receptors and ensure that adequate buffer distances are maintained, or other air quality mitigation measures are adopted during strong wind conditions.

Construction activities have the greatest potential for impact on air quality, although impacts from construction will be of a short-term duration at any individual location. Operation is not expected to result in any impacts on the environmental values of receptors near the corridor selection or substations.

Decommissioning would be expected to be similar to construction of the transmission line and substations. Routine mitigation activities to reduce the impact of dust and air emissions during demolition/disassembly would apply where dust emissions are expected to occur.

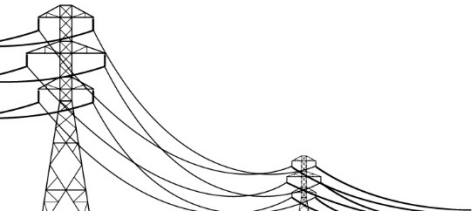
Electricity is currently supplied to the NWMP from local generation sources, with standalone diesel or gas generation at mine sites. The Project will provide a reliable low cost supply to existing customers in the NWMP, and enable new industrial facilities and large agricultural and renewable energy projects in the region to enter the National Energy Market. The Project is intended to provide increased reliability and capacity of electricity supply in NWMP and regional communities, resulting in prolonged economic development of the region, with considerable social benefit for local communities.

Although the Project is expected to host some of the new projects' power requirements, if the Project was not constructed the alternative would be to assume onsite diesel power generation since the Mica Creek Power Station's spare capacity and future capabilities are unknown. Therefore, the cumulative effect must be based on on-site diesel power generation.

Since the carbon intensity of diesel power generation and the current Project supply are virtually identical the cumulative effect for GHG emissions during operations then becomes the difference between the margin loss factor for the Project and the Scope 3 emissions from the transport of diesel. Should the renewable energy projects earmarked for the region come to fruition, then the net effect of the GHG emissions from the Project would again be reduced.

Construction power and GHG emissions are expected to come primarily from diesel or petrol driven vehicles and mobile equipment and the cumulative effect is an increase in GHG emissions during construction. Within the context of Queensland emissions relating to public electricity and heat production, the Scope 1 and 2 emissions from the Project equate to an increase in emissions of 0.36%. At a national level, the Project contributes an increase of 0.10% for emissions.

No cumulative impacts during construction or operation on air quality or GHG emissions.



Noise and vibration

The assessment of noise indicated that the Project may be constructed and operated without significant impact on sensitive receptors as long as appropriate management practices are implemented and siting studies are completed.

The placement of concrete batching plants and laydown areas should consider the proximity of sensitive receptors and ensure that adequate buffer distances are maintained or other noise mitigation measures are adopted.

Construction activities have the greatest potential for impact, although this is mitigated by the localised duration of construction in any particular location. Operational noise is not expected to result in any impacts on the environmental values of receptors near the line.

Decommissioning noise would be expected to be similar to construction of the transmission lines and substations. Mitigation activities to reduce the impact of construction noise would apply to decommissioning actions.

No cumulative impacts during construction or operation.

Waste and sustainability

The Project traverses a large linear area that includes seven regional councils, each with their own waste management facilities. Several of these facilities have the capacity to assist with the waste management of the Project.

The construction phase will be the primary source of waste generation throughout the life of the Project. Decommission will also generate are large amount of waste, however the actions will be addressed prior to the commencement of the decommissioning phase. Waste will be dealt with following the waste management hierarchy, where avoidance of waste generation is the most desirable course of action and disposal of waste is the least desirable course of action. Many types of waste are able to be reused or recycled and disposal should only be undertaken once all other avenues are exhausted.

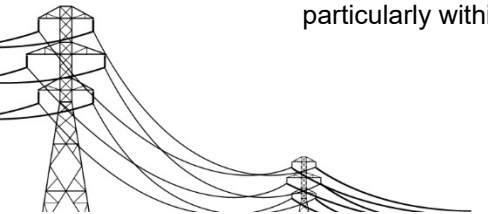
Large increases in waste generation and improper disposal methods are the primary impacts associated with waste during the Project. Cumulative impacts associated with Project waste generation may occur as the result of multiple Projects in the region requiring waste disposal facilities. However, these impacts can be mitigated by following the waste management hierarchy and ensure wastes are reduced, recycled or reuse before they are disposed.

Potential for cumulative impacts during construction only.

Transport

Construction equipment and personnel will need to be transported to construction locations. In addition there is the movement of often large and heavy plant and equipment that is used for construction operations. This will occur during initial construction and upon de-commissioning. Similarly, the movement of construction equipment and associated facilities would only occur during initial construction and upon de-commissioning. However, the movement of personnel is on a more regular basis.

Workers will travel between construction camps and respective construction zones, on a daily basis. Workers will operate at various construction zones along the corridor selection concurrently. It is anticipated that a combination of buses and predominantly 4WD vehicles will be used to transport workers to and from site. As such, high volumes of traffic are expected to be generated during peak construction periods. The one way workforce movements will primarily occur in the early morning and late afternoons, outside of existing peak hours, particularly within townships.



All of the projects will contribute to the level of traffic during construction. The remote, rural location of the Project is such that the concentration of traffic on road networks is likely to be lower, however cumulative effects will occur along the main Flinders/Barkly Highway between Townsville and Mount Isa.

Decommissioning is generally less intense due to less time pressure and is anticipated to be more staggered in time due to differing life spans of the projects. Decommissioning impacts are therefore not considered to be cumulative with regards to traffic and transport.

During operations the level of traffic movement associated with the Project is reduced to periodic inspections and maintenance activities and poses minimal cumulative effects.

Potential for cumulative impacts during construction only.

Social

The Project corridor selection and associated consultation with landholders has considered rural land fragmentation, disturbance of sensitive land uses and the amenity of homesteads to avoid potential social impacts.

The economic benefits of more competitive power prices are the primary driver for the Project. Its enabling nature will also provide spin-offs to the local community by way of an increased demand on support services and employment opportunities. As such the cumulative impact from the Project in relation to the social benefits provided by improved community benefit and prosperity is expected to be positive during construction and operation.

There are a number of projects planned in the regional study area that may occur at the same time as the Project's construction. During consultation it was also confirmed that there is a current skills shortage and there was unlikely to be the specialist skills required for the Project in the existing workforce.

Should all project activities occur, there is potential that there may be competition for labour in the regional study area, drawing workers from existing jobs and creating shortfalls. However, it is expected that the Project's workforce would be sourced from a combination of local and other parts of Queensland and Australia will be used for the Project along with opportunities for training local workforce which will not adversely impact the community.

No cumulative impacts during construction or operation

Cultural heritage

The cultural heritage assessment has identified a number of Indigenous and non-Indigenous cultural heritage sites within proximity of the corridor selection. Identified non-Indigenous sites are unlikely to be impacted by the Project due to their distance from the corridor selection. Indigenous cultural heritage sites will be managed through avoidance of known sites and development of the Cultural Heritage Management Plan with relevant Aboriginal parties.

No cumulative impacts during construction or operation.

Summary

Table 20-5 provides a summary of the expected potential cumulative impact risk for those values identified in Table 20-4 as requiring assessment and outlined in the assessment above.

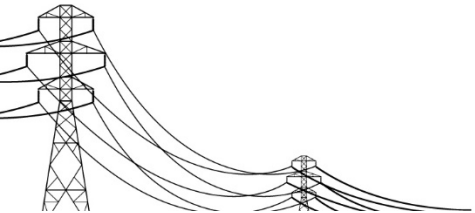


Table 20-5 Potential cumulative impact risk on environmental values

Natural environmental and built environmental values	Unmitigated Risk rating	Mitigated Risk Rating
Flora and fauna	Low	Low
Biosecurity	Low	Low
Traffic	Low	Low
Waste	Low	Low

20.4.2 Mitigation

The proposed mitigations are existing commitments within the EIS which are considered to be adequate to also mitigate the cumulative effects of other projects and include:

- Direct impact to areas of high ecological value will be avoided through the process of corridor realignments or spanned across wherever possible using higher towers as appropriate to the ecological values and the terrain constraints.
- A Road Use Management Plan and a Traffic Management Plan will be developed for the Project and will include consultation with the relevant transport authorities, such as DTMR, Queensland Rail and local government councils.
- Prior to leaving a Project work front, or moving between Project properties, work fronts or biosecurity risk areas, all vehicles, plant, equipment and machinery shall undergo clean down.
- Implementation of the waste management hierarchy to reduce the volumes of waste required to be disposed of to landfill.

Consideration of other projects in the region, adjusting schedules and where flexible, planning activities to reduce conflicts or detrimental interactions with other projects in the region should also be considered in pre-construction and procurement planning.

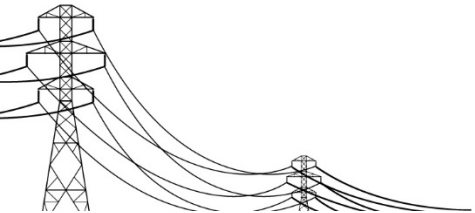
20.5 Conclusion

This cumulative impacts chapter describes the cumulative impacts of the Project and other proposed projects in the region. This assessment considered the relevant aspects of projects which may result in cumulative impacts to the broader region.

It was considered that mitigation and management measures incorporated into the Project would effectively avoid or otherwise manage potential cumulative impacts, such that residual consequences resulted in a low risk rating.

The unavoidable residual impacts with the greatest potential to result in longer term cumulative impacts involved the disturbance of conservation values associated with flora and fauna. Cumulative impacts associated with biosecurity, transport and waste are expected to be short-term, occurring only during the construction phase of the Project.

The Project has provided comprehensive avoidance and management strategies to mitigate or compensate for these non-significant impacts which are most prevalent during the construction phase. Similarly, each proponent of other projects considered in this assessment will be required to provide similar mitigation and management measures or offsets in accordance with Commonwealth and State policies for unavoidable impacts on potential habitat. Over time these



management measures or offsets should take account of the potential cumulative impacts that each project will incur.