



Delivering a Powerful Future



CopperString Project

Initial Advice Statement

21 May 2010

The following document was prepared by Resource and Land Management Services (RLMS) for the CopperString Project on behalf of the below management team.



The CopperString Project is being developed by a partnership between CuString Pty Ltd ACN 137 531 054 and Leighton Contractors Pty Ltd ABN 98 000 893 667.



TABLE OF CONTENTS

Abbreviations	iv
1. Introduction.....	1
1.1 Project Overview	1
1.2 Justification and Need	2
1.3 The Proponent	3
1.4 Purpose and scope of the IAS	3
2. Project Description.....	6
2.1 Location.....	6
2.2 Alternatives and Route Selection.....	6
2.3 Elements of the Project.....	7
2.3.1 Transmission Line	7
2.3.2 Sub-stations and Switching Stations	8
2.3.3 Easements.....	9
2.3.4 Access Tracks for Construction and Line Maintenance	9
2.3.5 Construction Camps	10
2.4 Proposed Timeframes	10
3. Existing Environment and Potential Impacts	11
3.1 Built and Socio-economic Environment.....	11
3.1.1 Population Centres.....	11
3.1.2 Infrastructure and Transport Network.....	12
3.1.3 Visual Amenity.....	12
3.1.4 Local, State and National Economies.....	12
3.1.5 Hazard and Risk.....	13
3.1.6 Indigenous and Cultural Heritage	13
3.1.7 Community Consultation	13
3.2 Land Tenure and Ownership	14
3.3 Biophysical and Natural Environment.....	18
3.3.1 Topography, Geology and Soils	18
3.3.2 Ecology.....	18
3.3.3 Water Resources.....	24
3.3.4 Air Quality	24
3.3.5 Waste	24
4. Environmental Approvals	26
4.1 Commonwealth.....	26
4.2 State.....	26
4.3 Local	27
Resources	28

ABBREVIATIONS

AC	Alternating current
CID	Community Infrastructure Designation, as defined under Chapter 5 of the <i>Sustainable Planning Act 2009</i>
DEWHA	Commonwealth Department of the Environment, Water, Heritage and the Arts
DIP	Queensland Department of Infrastructure and Planning
EIS	Environmental Impact Statement, as defined by Part 4 the <i>State Development and Public Works Organisation Act 1971</i>
EMF	Electromagnetic fields
EM Plan	Environmental Management Plan
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)
IAS	Initial Advice Statement, as defined by Part 4 the <i>State Development and Public Works Organisation Act 1971</i>
km	Kilometres
kV	Kilo-volt
m	Metres
MITEZ	Mount Isa to Townsville Economic Development Zone Inc
MNES	Matters of National Environmental Significance, as defined by the <i>Environment Protection and Biodiversity Conservation Act 1999</i> (Cth)
MW	mega-watt
NEM	National Electricity Market
NET	Northern Economic Triangle
NWMP	North West Minerals Province
NWQ	North-west Queensland
SDPWOA	<i>State Development and Public Works Organisation Act 1971</i>
SPA	<i>Sustainable Planning Act 2009</i>
The Project	The CopperString Project
TOR	Terms of Reference, as defined by Part 4 the <i>State Development and Public Works Organisation Act 1971</i>

1. INTRODUCTION

1.1 Project Overview

The CopperString Project (the Project), comprises of a partnership between CuString Pty Ltd (CuString) and Leighton Contractors Pty Ltd (Leighton Contractors) and proposes to construct an alternating current (AC) transmission line from a new sub-station on the Strathmore to Ross Transmission Line, south of Townsville, to the north west Queensland (NWQ) electricity supply system via a new connection at the Chumvale Sub-station, near Cloncurry (see Figure 1). A conceptual 275/330 kilo-Volt (kV) transmission line connection will allow the stand alone NWQ electricity supply system to connect into the national transmission network and National Electricity Market (NEM). The Project will assure more reliable and competitively priced electricity is available for NWQ.

Woodstock, south of Townsville, has been identified as the preferred sub-station site to connect to the national electricity grid, further options have been identified at the existing Ross and Strathmore Sub-station sites for potential connections. Further expansion of the western area of the Project beyond the Chumvale Sub-station may occur, subject to demand from potential customers in the North-West Minerals Province (NWMP). A study area for further expansion of the base alignment has been identified (see Figure 1), which extends further west to Mount Isa, as well as north and south to service existing and potential mining operations. The baseline transmission corridor and this additional study area make up the initial study corridor for the Project.

Current energy prices in the NWMP are high by national and international standards and the energy supply options are limited. The prices do not reflect energy prices that are available in the NEM. The combination of these factors inhibits the development of new mines and reduces the economic life of current mineral production operations. Access to competitively priced electricity for the NWMP, through a connector whose capacity is readily upgradable, will significantly contribute to the prolonged economic development of the region with considerable social benefits for the community in the region.

The Project will provide an electricity transmission network 'backbone' through the Northern Economic Triangle (NET), an area identified by the Queensland Government as being one of Australia's potentially most productive economic regions. The Project would underpin the vision of the Queensland Government commitment to 'foster sustainable economic, social and community growth through the emergence of Mount Isa, Townsville and Bowen as a triangle of mineral processing and industrial development.'

The initial study corridor traverses an identified clean energy corridor of significant renewable energy resources that would benefit from the ability to connect to the NEM to export electricity. Three renewable energy projects were identified at the North Queensland Renewable Energy Roundtable Forum in November 2009. These projects require a connection to the national electricity grid to be economically feasible. A BIS Shrapnel Report of March 2010, commissioned by the Mount Isa to Townsville Economic Development Zone Incorporated (MITEZ), concluded that these projects have the potential for up to 900 mega-watts (MW) of installed renewable energy capacity to be connected to the NEM by 2015/2016.

The Project utilises existing proven AC transmission line engineering to provide approximately 400 MW of transfer capability with high reliability by means of a twin-conductor double-circuit assembly. The transmission line route may potentially exceed 1100 kilometres (km) in length depending on user requirements and is expected to have a total financing requirement of approximately \$1 billion. The transfer capacity is intended to complement, and not replace, the existing energy infrastructure in north and north-west Queensland.

1.2 Justification and Need

The long term economic and social development of the NWMP is heavily dependent on the availability of competitively priced and reliable electricity supply through a system that is upgradable to meet future demand. This requirement has been recognised by the Queensland Government in a number of policy statements and strategies and through the provision of practical support. These Government initiatives include:

- The Northwest Queensland Development Initiative – mid-to-late 1990s
- The NET Infrastructure Plan – 2007
- Progressing a number of priority actions as highlighted in the NET Infrastructure Plan Progress Report – 2007
- Commissioning (jointly with the Queensland Resources Council), a review of North West Queensland Energy Delivery (the Sims Review) – 2009.

The Federal Government identified the extension of the national electricity grid to the NWMP as a national infrastructure priority in 2009, and has been an active stakeholder in the Sims Review process.

This is a private sector initiative that will deliver significant community benefits within the local, regional and National contexts. Based on the recommendations of the Sims Review, the project will upgrade the electricity supply to the NWMP to foster the continued economic, social and community growth of the region.

The development of the Project would support the following:

- Access to competitively priced energy would further diminish the risk of energy price instability from a single primary energy source
- An electricity connection path for future renewable energy projects within the clean energy corridor
- Increased resource exploration in NWQ by providing competitive and reliable energy supply for the processing of products
- Access to the NEM by small mining operations that will decrease reliance on diesel power generation
- Decreased risk of supply interruptions to industrial users and communities
- The potential to co-locate other linear infrastructure along the transmission line (such as oil and gas pipelines).

The establishment of the Project would see the delivery of highly reliable and competitively priced electricity from the NEM to the NWMP and communities in NWQ.

The Ministerial Council on Energy has recognised the challenge many renewable energy projects face in accessing the NEM and the importance of facilitating the scale-efficient expansion of the electricity supply network to address this issue. The Project provides the expansion of the national electricity grid consistent with the objective of the Ministerial Council on Energy to well recognised renewable energy resources in northern Queensland. The access advantages that will be provided to the clean energy corridor between Townsville and Mount Isa would assist projects that will contribute to the Commonwealth Government's Renewable Energy Target and meeting the needs of future national carbon emissions reduction obligations or schemes.

The Project will provide direct employment opportunities as part of the construction and during operation. It is anticipated that 400 people will be employed during the construction of the Project and 30 people will be required to operate and maintain the infrastructure. Indirect employment opportunities will occur as a result of the construction and commissioning of the project by means of further regional development and an expansion to the exploration, mining and resources processing of the region due to the provision of competitive and reliable electricity.

1.3 The Proponent

The Project is being developed by a partnership between CuString Pty Ltd and Leighton Contractors Pty Ltd. CuString is commencing the process of registering as an intending Transmission Network Service Provider. Leighton Contractors is an industry leader in the development and delivery of major social and economic infrastructure projects with Government and private sector stakeholders in Australia and New Zealand.

CuString will be nominated as the Proponent for the purposes of environmental assessment and approvals of the Project. It is intended for Leighton Contractors to undertake the design, construction, commissioning, operations and maintenance of the Project.

The combination of CuString and Leighton Contractors brings leading infrastructure delivery capability together with a detailed understanding of the electricity supply industry and the economics of energy in northern Queensland.

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1.4 Purpose and scope of the IAS

This Initial Advice Statement (IAS) has been prepared to provide a brief overview of the Project and to summarise the impacts that may occur due to the construction, operation and decommissioning of the project. It will assist the following key stakeholders:

- The Coordinator-General in the decision making process of declaring the Project a 'significant project' under Section 26 of the *State Development and Public Works Organisation Act 1971* (SDPWOA)
- The Department of Infrastructure and Planning (DIP), who are responsible for preparing draft Terms of Reference (TOR) for the Project on behalf of the Coordinator-General
- Advise any other key stakeholder groups and interested parties about the general scope and objectives of the Project.

The IAS is a scoping document and does not purport to provide an in-depth analysis of the Project. Technical and detailed analysis of the project will be provided in the EIS.

<Figure 1- CopperString Project Locality Map >

2. PROJECT DESCRIPTION

2.1 Location

The Project proposes to construct an electricity transmission line from a new sub-station at Woodstock, south of Townsville (or alternative site – identified on Figure 1) to a new connection into the NWQ electricity supply system at Chumvale, near Cloncurry (see Figure 1). Subject to demand from potential customers in the NWMP, further expansion of the western area of the Project beyond the Chumvale Sub-station may occur. A study area for further expansion of the base alignment has been identified, which extends further west to Mount Isa, as well as north and south to service existing and potential mining operations. The additional transmission line options are subject to future commercial negotiations and may not form part of the final Project.

The initial study corridor, including the potential options for expansion, may exceed 1100 km and crosses several local government areas. These areas are:

- Townsville City Council
- Whitsunday Regional Council
- Burdekin Shire
- Charters Towers Regional Council
- Flinders Shire
- Richmond Shire
- McKinlay Shire
- Cloncurry Shire
- Mount Isa City Council.

The initial study corridor is approximately 5 km wide. The final route alignment will occur within this study corridor and will be based on further community consultation, environmental investigation and construction constraints.

2.2 Alternatives and Route Selection

The EIS for the Project will detail the rationale for the project and include information on specific aspects of the project to allow stakeholders to have input and gain understanding as the project develops to its final form. Information will be provided about the benefits and consequences of proceeding with the Project. The 'do nothing' option will also be discussed in the EIS, outlining how the existing circumstances may be affected if the Project does not proceed.

The route selection process used to identify the initial study corridor was based on a constraints assessment utilising the following key selection criteria:

- Disturbance to areas of known ecological value
- Disturbance to existing landholders, land use and possible sensitive receptors
- The corridor length
- Terrain constraints/limitations
- Disturbance to areas of known heritage values
- The ease of access for construction and operations
- Co-location opportunities with other linear infrastructure
- Disturbance to and potential interference with existing infrastructure
- Construction requirements, such as:

- Inundation areas
- Soil stability and erodability
- Number of large watercourse crossings
- Number of affected infrastructure crossings.

The final transmission line alignment will require an easement of 120 metres (m) that will be determined by utilising the above selection criteria, detailed environmental investigation from the EIS process and any results of community consultation on the initial study corridor.

Woodstock, south of Townsville, has been identified as the preferred sub-station site to connect to the national electricity grid, further options have been identified at the existing Ross and Strathmore Sub-station sites for alternative connection points. The final sub-station site will be determined through ongoing negotiations with Powerlink and the final Project will only require one eastern sub-station site.

2.3 Elements of the Project

The following elements of the Project will form the resultant new power transmission infrastructure. The completion of construction works will be the culmination of an project development period involving extensive liaison with governments, authorities, communities, special interest groups, financial institutions, designers, equipment suppliers, consultants and contractors. Following the construction and commissioning of the transmission line, there will be ongoing maintenance to ensure the required level of reliability is maintained.

Construction methodologies will be refined during the design process in conjunction with the designated construction contractors and assessed as part of the EIS process. The life of the Project will be in excess of 40 years.

The Project requires substantial on-ground activity during the construction of the transmission line and associated infrastructure, though due to the nature of the linear infrastructure it is not likely that this impact will adversely affect any single location. After the commissioning of the Project, the amount of activity on site will decrease substantially. Typical maintenance operations will involve annual vegetation control works and five yearly aerial inspections and periodic track maintenance.

2.3.1 Transmission Line

The proposal comprises a 720 km high-voltage transmission line from the existing 275 kV Powerlink transmission network at Woodstock (or alternative site) to Chumvale (near Cloncurry), with additional capacity from Chumvale to a number of individual prospective network users. The inclusion of the northern, western and southern extensions to these network users has the potential to extend the transmission line by 60 to 400 km.

The new line will conceptually be a 275/330 kV AC double circuit system providing approximately 400 MW of firm transfer capability. The new line will greatly enhance reliability of electricity supply to the NWMP.

The support towers may comprise either galvanized steel self standing lattice construction or guyed galvanized steel lattice construction, though the final design will be determined during the EIS process. Both the Designs are typical of transmission lines constructed in Australia. The distance between towers will typically range from between 400-600 m, although this may vary depending on the topography and clearance required in particular areas of the alignment.

The final alignment of the towers will result from careful consideration of all physical constraints such as sensitive environmental areas, significant watercourse/infrastructure crossings, existing land use and amenity and will be located to minimise visual impacts. Locally the towers will be sited to make best use of available terrain providing both sound foundation whilst minimising impacts with existing water courses and other natural features.

An example of a typical 275 kV AC transmission line is provided below in Figure 2.

Figure 2 : Typical 275 kV AC transmission line



2.3.2 Sub-stations and Switching Stations

The preliminary design includes for new sub-stations at the nominal termination points of the transmission line, namely at Woodstock (or alternative site) where connection will be made to the national electricity grid and at Chumvale, near Cloncurry. There is potential to include intermediate sub-stations along the alignment to improve reliability and make provision for future connections.

An example of a recently constructed 330 kV sub-station is shown below in Figure 3.

Figure 3 : Recently constructed 330 kV sub-station



2.3.3 Easements

The final transmission line corridor for the Project will require an easement of 120 m in width. The easement is a registered interest in a parcel of land for which the Project may offer compensation options to the relevant landholder, with the landholder retaining ownership and most uses of the land. As part of the land acquisition process registered valuers will conduct an assessment of the property and determine the impact of any transmission line on the value of the property. The Project will document a detailed landholder engagement strategy to consult affected landholders and provide a path for comments to feed into the refined design and alignment of the transmission line.

There are restrictions placed on any activities that are permitted on a transmission line easement to ensure the safety of the public is maintained and the line can operate reliably. The restrictions also apply to the amount of vegetation permitted within the easement. The level of vegetation clearing necessary will be assessed based on the environmental investigations, detailed design and alignment of the transmission line.

2.3.4 Access Tracks for Construction and Line Maintenance

Access to the transmission line is required for both construction and maintenance. Whilst it is usual for the access track to be within the easement adjacent to the towers for relatively flat or open terrain, it is not essential that the access track be wholly contained within the easement. In steeper terrain or where watercourses intersect the easement, tracks may need to detour off the easement to avoid obstacles and follow natural contours hence providing trafficable grades for maintenance vehicles. In all cases maximum use is made of existing roads and tracks and owners' consent is obtained for access through private properties.

2.3.5 Construction Camps

The EIS will detail the workforce requirements for the Project based on the final construction methodologies. It is currently anticipated the construction of the Project within the required timeframes will require approximately 400 people working in a number of construction teams.

It is anticipated there will be a minimum of four construction zones that will all operate concurrently. Each zone will be serviced by a central camp and a project office. Each camp will be located within proximity of a regional township to enhance access to existing water and power supplies plus providing ready access to regional airports to facilitate travel for specialist construction workforce that cannot be sourced locally.

The temporary construction camps will be designed to provide a high level of accommodation to industry standards and will comply with all relevant legislation and regulations, including the required building codes and occupational health and safety guidelines. Potential camp sites are currently being investigated in consultation with local authorities and communities to ensure minimal impacts to host communities during the construction phase.

2.4 Proposed Timeframes

Table 1 provides a preliminary timeline for the completion of the major components of the Project assuming its designation as a 'significant project' under the SDPWOA.

Table 1 : CopperString Project Schedule

CopperString Project Milestone	Completion Date
Preliminary Design	Q2 2010
Completion of the EIS Process	Q3 2011
Detailed Design	Q3 2011
Financial Close / Construction Commences	Q4 2011
Commissioning	Q4 2013

The Project is based on the development and connection process framework provided by the National Electricity Rules to ensure transparency for potential users and to maximise the confidence of the community, government and potential investors.

3. EXISTING ENVIRONMENT AND POTENTIAL IMPACTS

The construction and operation of any major infrastructure project normally leads to some degree of social, environmental and economic impact, which may be positive or negative. In the case of the CopperString Project, the proponents will commit, via the EIS process, to a range of mechanisms to minimise the negative impacts and enhance the positive benefits of the Project.

The impact assessment process that will form the EIS for the Project will follow a rigorous and systematic methodology, involving:

- Establishing baseline data and information on the study area
- Identifying potential impacts based on proposed activities
- Devising suitable mitigation measures to firstly avoid or secondly reduce these impacts
- Estimating the significance of impacts and proposing offsets where required.

3.1 Built and Socio-economic Environment

3.1.1 Population Centres

Major townships that occur along the initial study corridor include:

- Townsville
- Collinsville
- Charters Towers
- Pentland
- Hughenden
- Richmond
- Julia Creek
- Cloncurry
- Mount Isa.

The initial study corridor avoids crossing any existing population centres and associated small rural lots that surround these centres. It is not expected there will be any adverse impacts between the Project and the residents of these identified centres.

It is anticipated the Project will have a positive economic impact on the surrounding towns along the final transmission route. The primary positive impacts are likely to be an increase in local employment opportunities from the growth of mining and resource exploration along the transmission line, as well as training and community development opportunities. There are expected to be short-term construction impacts and longer term direct and indirect employment benefits.

Effects such as an increase in the population of the region may result in impacts to the local housing markets and access to community services. Through the consultation and engagement of relevant stakeholders, the EIS will examine these impacts and provide recommendations to enhance the benefits of the Project and minimise any potential adverse impacts.

3.1.2 Infrastructure and Transport Network

The construction of the Project will require the transport of a significant amount of equipment and materials to sites along the transmission line corridor. It is proposed that the majority of these materials are transported by road; however rail options will also be considered. The Flinders Highway would be the most suitable road to supply the work sites as the initial study corridor roughly aligns with the southern side of this road network. In March 2010 AMSTEC Design Pty Ltd, on behalf of MITEZ, completed a report on the impact of road freight to the Flinders Highway to better understand the freight demand and conditions of the infrastructure network.

The workforce will also increase the vehicle traffic on major and local road networks. Where possible the existing public road network will be utilised, though access to private access roads will be negotiated with private landholders where applicable. In some cases roads may have to be upgraded to allow for the safe transport of materials.

The final transmission line may cross existing linear infrastructure easements (e.g. road, rail, electricity and stock routes). Appropriate environmental assessment and technical design will shape the most appropriate crossing locations and suitable management plans will be developed to ensure safety of the general community and workforce is paramount.

3.1.3 Visual Amenity

The visual impact of the proposed transmission line will be assessed with reference to the existing landscape values of the initial study corridor. Visual sensitivity in terms of land use and distances of potential sensitive receptors, notably rural residences and local communities, will be considered during the assessment. The initial study corridor has been designed to avoid larger residential areas and the land surrounding the initial study corridor is predominantly rural in character.

The Project will endeavour where possible to avoid any significant impact to the visually sensitive areas by adjustment of the final transmission easement and will utilise the existing topography, vegetation patterns and landforms to minimise the visual impact of the transmission line.

3.1.4 Local, State and National Economies

During the construction phase there will be significant expenditure in the local regional economies, including the purchase of goods and services for construction and expenditure by workers based at the construction camps. The long-term social and economic impacts will depend on the extent that the region expands or develops as a result of this resource opportunity.

The mining industry is the largest employment sector of the region and the development of the Project would ensure the continued growth of the sector through greater resource and mineral exploration. The investment of approximately \$1 billion will be directly related to the Project and a significant economic stimulus in flow-on investment of other ventures in northern Queensland may result from the operation of the transmission line and the access it will provide to the NEM. Government revenue may also benefit in the form of greater royalty payments as a result of an increase in mineral exploration within the region.

3.1.5 Hazard and Risk

Hazard and risk associated with the implementation and operation of the Project will be managed through strict adherence with legislative requirements and the Project's occupational health and safety plan. A risk assessment will be conducted to establish the likelihood and consequences of any potential hazards and associated risks of construction and operation of the transmission line in accordance with *Australia/New Zealand AS/NZS ISO 31000:2009 Risk Management – Principles and guidelines*.

The main risks in relation to the transmission line include those associated with fire, structural collapse and natural disasters. The final transmission line easement will have vegetation clearing requirements to limit the possibility of fire from ground earthing and the design of the structural components will comply with legislative requirements for safety in flooding areas.

Electromagnetic fields (EMF) will be addressed as part of the environmental assessment and an indication of the potential exposure to EMFs and a discussion of the effects of EMFs on human health will be presented in the EIS. The evaluation of potential impacts will be conducted in line with the current international best practice assessment methodologies.

3.1.6 Indigenous and Cultural Heritage

An initial assessment of Native Title of the study area has revealed several Native Title Claims. Native Title Parties will be consulted during the development of the Project. The claimant parties include the:

- Gudjala People
- Jangga People
- Birri People
- Yirendali People
- Wanamara People
- Kalkadoon People 4
- Kalkadoon People 5.

The Project's impacts on any cultural heritage values will be managed under a cultural heritage management plan that will address the duty of care requirement under the *Aboriginal Cultural Heritage Act 2003*.

An assessment will be conducted to identify sites of Aboriginal cultural heritage and places of heritage significance within the preferred alignment corridor. Any impacts and mitigation measures will be detailed in the EIS.

3.1.7 Community Consultation

The Project is developing a comprehensive community consultation program as part of the design and construction of the project. As part of the EIS process, community consultation will occur at defined stages; where the community and government advisory agencies will be invited to comment on the draft TOR and EIS.

A website will be established, a free-call phone number will be advertised and regular newsletters and other communication materials will be distributed to stakeholders during this process. It is also anticipated that stakeholders will be invited to attend one-on-one meetings and information forums throughout the project's development.

Outside of the statutory requirements, the Project will be actively seeking the input of the community and associated stakeholders to provide local input resulting in the best possible outcome for the various groups and individuals involved.

The community consultation plan will ensure stakeholders are provided with accurate and detailed information and opportunities to have an input to the plan's development, whilst maintaining the privacy of landholder records.

A preliminary assessment has identified a wide audience for stakeholder engagement, including:

- Individuals (directly affected by the project)
- Communities (along the preferred alignment)
- Traditional Owner Groups in the area
- Commonwealth, State and local governments
- Community/development and environmental and groups interested in the project
- Local businesses
- Renewable energy providers
- Potential customers that may require electricity supply from the Project.

The community consultation program will continue into the construction and commissioning of the Project to ensure stakeholders have an avenue to question, provide feedback and be involved with the project.

3.2 Land Tenure and Ownership

Cropping and cattle grazing/breeding have typically made up the majority of the land uses in the study area. In 2005-06 the total value of agricultural production in the greater local government areas was \$774.9 million, or 8.6 per cent of the total value of agricultural production in Queensland. These agricultural pursuits have typically come from large rural operations that are reflected in the large land parcel sizes along the initial study corridor.

The corridor generally traverses large holdings (freehold and leasehold) of cleared land used for primary production (see Figure 4). It is important to note that the major townships throughout the study area are avoided by the proposed alignment. Land uses throughout the study area are of a rural nature, with concentrations of services and social infrastructure located at the major towns identified in Section 3.1.1.

The initial study corridor identifies approximately 110 land parcels that may be impacted by the transmission line over the 720 km route alignment and with an increase in the length of the transmission line up to an additional 40 land parcels may be affected. The final transmission line easement is to be refined based on community consultation and environmental investigation. The likely property tenures that will be impacted include:

- Private property (freehold land)
- Land lease
- Crown land
- Native Title
- Easements, covenants and rights of way.

The initial study corridor has not impacted any known protected areas, reserves or state forests. An assessment of the various property tenures will be included in the EIS for the Project.

Due to the extensive nature of mining around the NWMP the transmission line will traverse numerous mining tenements (see Figure 5). The initial study corridor has avoided existing extractive industry operations and consultation will occur with the owners of exploration permits to ensure the final alignment can accommodate the forward planning of mining companies.

It is anticipated that the existing land uses within the initial study corridor will be compatible with the development of the project. There is the potential for some land uses interfering with the proposed transmission line. These issues will be identified through the consultation process and refinement to the study corridor may occur to accommodate future development activities.

<Figure 4 – Land Use>

<Figure 5 – Mining Tenures>

3.3 Biophysical and Natural Environment

3.3.1 Topography, Geology and Soils

The Project extends over a large part of Northern Queensland and as such the topography, geology and soil composition varies greatly.

From east to west the transmission line will traverse the Brigalow Belt North, Desert Uplands, Mitchell Grass Downs, Gulf Plains and Mount Isa Inlier bioregions; each bioregion comprising a unique combination of landform, soils, and vegetation.

Underlying geology influences topography and soils, and from east to west the transmission line will traverse the metamorphic and igneous rocks of the Cape River Province, the sedimentary rocks of the Eromanga and Carpentaria Basins, and the metamorphic and igneous rocks of the Mount Isa Inlier (see Figure 6). Soils are dominated by red duplex and massive earths to the east and massive earths to the west, with the central region dominated by relatively flat terrain with cracking clay soils. Quaternary alluvial sediments cover a significant part of the region, associated with water courses and flood plains.

In the east, the transmission line will cross the Great Dividing Range within the Desert Uplands Bioregion which comprises sandstone ranges and plains, providing an easier passage across the Great Divide than to the north which is dominated by granite ranges and basalt tablelands.

The Project will require vegetation clearing and trimming within the final 120 m easement and the construction of the transmission towers will require small areas of excavation and vegetative cover loss. These activities may cause the erosion of soils and measures will be implemented to limit the adverse impacts of soil erosion.

The clearing of vegetation around waterways and drainage lines will be minimised where possible to restrict the release of additional sediments into waterways during construction and maintenance. An erosion and sediment management plan will be provided in the EIS detailing how the risk of soil erosion will be managed for the Project.

It is unlikely that acid sulphate soils will be encountered within the initial study corridor, though an assessment of acid sulphate soils will be included in the EIS.

3.3.2 Ecology

The initial study corridor has been selected to avoid impacts to national parks, forest reserves, state forests or nature refuges. Despite limited Regional Ecosystem mapping of the study area it is possible that 'endangered' and 'of concern' regional ecosystems will be impacted in the final transmission line alignment. Detailed field studies will be required to both confirm the existing mapping and investigate areas where detailed ecosystem mapping is not available.

An EPBC Act Protected Matters Search was undertaken on the initial study corridor (including the eastern alternatives) with a buffer zone of 10 km to allow for the potential realignment of the route. Table 2 provides a summary of the EPBC Act Protected Matters Report. The results of the corridor search include the potential to encounter 4 threatened ecological communities, 27 threatened species and 22 migratory species listed under the EPBC Act.

Table 2 : EPBC Act Protected Matters Search for the Initial Study Corridor

Wetlands of International Significance		
	Bowling Green Bay – within the same catchment	Ramsar Site
	Coongie Lakes – within the same catchment	Ramsar Site
Threatened Ecological Communities		
	The community of native species dependent on natural discharge of groundwater from the Great Artesian Basin	Endangered
	Brigalow (<i>Acacia harpophylla</i> dominant and co-dominant)	Endangered
	Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin	Endangered
	Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered
Category	Species Description	Status
Threatened Species		
Birds	<i>Erythrotriorchis radiatus</i> (Red Goshawk)	Vulnerable
	<i>Erythrura gouldiae</i> (Gouldian Finch)	Endangered
	<i>Geophaps scripta scripta</i> (Squatter Pigeon (southern))	Vulnerable
	<i>Neochmia ruficauda ruficauda</i> (Star Finch (eastern), Star Finch (southern))	Endangered
	<i>Poephila cincta cincta</i> (Black-throated Finch (southern))	Endangered
	<i>Rostratula australis</i> (Australian Painted Snipe)	Vulnerable
Mammals	<i>Dasyurus hallucatus</i> (Northern Quoll)	Endangered
	<i>Hipposideros semoni</i> (Semon's Leaf-nosed Bat, Greater Wart-nosed Horseshoe-bat)	Endangered
	Spotted-Tail Quoll or Yarri (North Queensland subspecies)	Endangered
	<i>Pteropus conspicillatus</i> (Spectacled Flying-fox)	Vulnerable
	<i>Rhinolophus philippinensis</i> (large form) (Greater Large-eared Horseshoe Bat)	Endangered
	<i>Sminthopsis douglasi</i> (Julia Creek Dunnart)	Endangered
	<i>Xeromys myoides</i> (Water Mouse, False Water Rat)	Vulnerable
Reptiles	<i>Egernia rugosa</i> (Yakka Skink)	Vulnerable
Sharks	<i>Pristis microdon</i> (Freshwater Sawfish)	Vulnerable
Plants	<i>Acacia crombiei</i> (Pink Gidgee)	Vulnerable
	<i>Acacia ramiflora</i>	Vulnerable
	<i>Croton magneticus</i>	Vulnerable
	<i>Dichanthium queenslandicum</i> (King Blue-grass)	Vulnerable
	<i>Eucalyptus paedoglauca</i>	Vulnerable
	<i>Eucalyptus raveretiana</i> (Black Ironbox)	Vulnerable
	<i>Hydrocharis dubia</i> (Frogbit)	Vulnerable
	<i>Cycas ophiolitica</i>	Endangered
	<i>Leucopogon cuspidatus</i>	Vulnerable
	<i>Marsdenia brevifolia</i>	Vulnerable
	<i>Taeniophyllum muelleri</i> (Minute Orchid, Ribbon-root Orchid)	Vulnerable
	<i>Tylophora williamsii</i>	Vulnerable
Migratory Species		
Migratory Terrestrial Species – Birds	<i>Erythrura gouldiae</i> (Gouldian Finch)	Migratory
	<i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)	Migratory
	<i>Hirundapus caudacutus</i> (White-throated Needletail)	Migratory
	<i>Hirundo rustica</i> (Barn Swallow)	Migratory
	<i>Merops ornatus</i> (Rainbow Bee-eater)	Migratory
	<i>Monarcha melanopsis</i> (Black-faced Monarch)	Migratory
	<i>Monarcha trivirgatus</i> (Spectacled Monarch)	Migratory

	<i>Myiagra cyanoleuca</i> (Satin Flycatcher)	Migratory
	<i>Rhipidura rufifrons</i> (Rufous Fantail)	Migratory
Migratory Wetland Species – Birds	<i>Ardea alba</i> (Great Egret, White Egret)	Migratory
	<i>Ardea ibis</i> (Cattle Egret)	Migratory
	<i>Calidris acuminata</i> (Sharp-tailed Sandpiper)	Migratory
	<i>Charadrius veredus</i> (Oriental Plover, Oriental Dotterel)	Migratory
	<i>Gallinago hardwickii</i> (Latham's Snipe, Japanese Snipe)	Migratory
	<i>Glareola maldivarum</i> (Oriental Pratincole)	Migratory
	<i>Grus antigone</i> (Sarus Crane)	Migratory
	<i>Nettapus coromandelianus albipennis</i> (Australian Cotton Pygmy-goose)	Migratory
	<i>Rostratula benghalensis s. lat.</i> (Painted Snipe)	Migratory
Migratory Marine Birds	<i>Apus pacificus</i> (Fork-tailed Swift)	Migratory
	<i>Ardea alba</i> (Great Egret, White Egret)	Migratory
	<i>Ardea ibis</i> (Cattle Egret)	Migratory
Reptiles	<i>Crocodylus porosus</i> (Salt-water Crocodile, Estuarine Crocodile)	Migratory
Listed Marine Species		
Birds	<i>Anseranas semipalmata</i> (Magpie Goose)	Listed - overfly marine area
	<i>Apus pacificus</i> (Fork-tailed Swift)	Listed - overfly marine area
	<i>Ardea alba</i> (Great Egret, White Egret)	Listed - overfly marine area
	<i>Ardea ibis</i> (Cattle Egret)	Listed - overfly marine area
	<i>Calidris acuminata</i> (Sharp-tailed Sandpiper)	Listed
	<i>Calidris ferruginea</i> (Curlew Sandpiper)	Listed - overfly marine area
	<i>Calidris ruficollis</i> (Red-necked Stint)	Listed - overfly marine area
	<i>Charadrius mongolus</i> (Lesser Sand Plover, Mongolian Plover)	Listed
	<i>Charadrius ruficapillus</i> (Red-capped Plover)	Listed - overfly marine area
	<i>Charadrius veredus</i> (Oriental Plover, Oriental Dotterel)	Listed - overfly marine area
	<i>Gallinago hardwickii</i> (Latham's Snipe, Japanese Snipe)	Listed - overfly marine area
	<i>Glareola maldivarum</i> (Oriental Pratincole)	Listed - overfly marine area
	<i>Haliaeetus leucogaster</i> (White-bellied Sea-Eagle)	Listed
	<i>Hirundapus caudacutus</i> (White-throated Needletail)	Listed - overfly marine area
	<i>Hirundo rustica</i> (Barn Swallow)	Listed - overfly marine area
	<i>Merops ornatus</i> (Rainbow Bee-eater)	Listed - overfly marine area
	<i>Monarcha melanopsis</i> (Black-faced Monarch)	Listed - overfly marine area
<i>Monarcha trivirgatus</i> (Spectacled Monarch)	Listed - overfly marine area	

	<i>Myiagra cyanoleuca</i> (Satin Flycatcher)	Listed - overfly marine area
	<i>Nettapus coromandelianus albipennis</i> (Australian Cotton Pygmy-goose)	Listed - overfly marine area
	<i>Rostratula benghalensis s. lat.</i> (Painted Snipe)	Listed - overfly marine area
	<i>Rhipidura rufifrons</i> (Rufous Fantail)	Listed - overfly marine area
Reptiles	<i>Crocodylus johnstoni</i> (Freshwater Crocodile)	Listed
	<i>Crocodylus porosus</i> (Salt-water Crocodile, Estuarine Crocodile)	Listed

There are several known protected areas located within close proximity to the initial study corridor that are not expected to be impacted by the Project. These include Paluma Range National Park, Bowling Green Bay National Park, Mingela State Forest, Dalrymple National Park, Toomba Nature Refuge, White Mountains National Park, Porcupine Gorge National Park and Sonoma State Forest (see Figure 7).

The greatest potential impact to areas of ecological sensitivity will result from the required vegetation clearing for the final transmission line easement and associated access roads. Maintenance to the transmission line will also require trimming and removal of vegetation to allow for its safe operation. As previously discussed the initial study corridor has been refined to avoid large sensitive ecological areas and field investigations will be required to ensure that the transmission line avoids areas of high habitat and vegetation values.

In addition to the species listed under the EPBC Act (Table 2) a number of threatened flora and fauna species listed under the *Nature Conservation Act 1992* have been documented to occur within the initial study corridor. The EIS will highlight all potentially affected species as well as the investigations and commitments to avoid, minimise and mitigate any impacts on areas of ecological sensitivity within the initial study corridor.

<Figure 6 – Geology>

<Figure 7 - Environment>

3.3.3 Water Resources

The final transmission line will cross numerous waterways and flooding areas in a number of water catchments (see Figure 8). The initial study corridor avoids large waterbodies though some water crossings are unavoidable. The alternative eastern sub-station connection at Strathmore would require the final transmission line to skirt Lake Dalrymple (Burdekin Falls Dam). The major watercourse crossings include the:

- Burdekin River
- Leichhardt River
- Landsborough River
- Flinders River
- Saxby River
- Cloncurry River.

In addition, there is an area between Julia Creek and Cloncurry known as the Gilliat Channels which may be subject to flooding events during the wet season (summer months). The potential impact to water quality is likely to be highest during the construction phase. Any exposed areas could potentially contribute a higher sediment load to receiving waters.

Measures will be implemented to avoid impacts to waterways and these will include:

- the design and placement of infrastructure
- minimising the clearing extent and degree of embankment disturbance during any earthworks
- special design requirements for any tower structures that may potentially be in a flooding area.

3.3.4 Air Quality

There is the potential to create dust during the construction phase of the transmission line. Given the rural setting of the Project it is anticipated that this will not create a major impact to sensitive receptors. The use of existing access tracks and easements will also minimise the generation of dust. The EIS will detail any potential air quality impacts and propose mitigation measures for any impacts that cannot be avoided.

3.3.5 Waste

It is anticipated that there will be a minimal level of waste will be generated during construction. Consideration of the minimisation of waste, recycling of waste materials and the appropriate disposal of waste will be incorporated into the EM Plan for the Project to ensure it is considered throughout the design, construction and operation phases.

<Figure 8 – Water Resources>

4. ENVIRONMENTAL APPROVALS

4.1 Commonwealth

Due to the nature of the Project and linear infrastructure in general traversing a large area of land, the project will be referred to the Department of the Environment, Water, Heritage and the Arts (DEWHA) for an assessment of whether it will be a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The EPBC Act is the primary environmental legislation of the Commonwealth Government and assesses projects that may have significant impacts on matters of national environmental significance (MNES).

If the Project were to be designated a controlled action under the EPBC Act, it would be assessed under the one environmental process coordinated by the Queensland Government with separate assessment reports from the Coordinator-General and the Commonwealth Minister for the Environment, Heritage and the Arts. This is due to the bilateral agreement in place between the Commonwealth and Queensland Government that seeks to streamline the environmental approval process.

Other Commonwealth legislation that may be relevant to the Project includes the:

- *Aboriginal and Torres Strait Islander Act 2005*
- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*
- *Native Title Act 1993.*

4.2 State

This document forms part of an application for declaration as a 'significant project' under Section 26(1)(a) of the SDPWOA. Based on the Coordinator-General's decision to declare the Project a 'significant project', the EIS process under Part 4 of the SDPWOA would form the primary environmental assessment and approval for the project.

Outside of the SDPWOA the Project will also require various State approvals and permits under applicable legislation. The legislation that may be relevant includes the:

- *Aboriginal Cultural Heritage Act 2003*
- *Acquisition of Land Act 1967*
- *Building Act 1975*
- *Electricity Act 1994*
- *Environmental Protection Act 1994*
- *Forestry Act 1959*
- *Land Act 1994*
- *Land Protection (Pest and Stock Route) Management Act 2002*
- *Native Title Queensland Act 2003*
- *Nature Conservation Act 1992*
- *Sustainable Planning Act 2009*
- *Transport Infrastructure Act 1994*
- *Vegetation Management Act 1999*
- *Water Act 2000.*

4.3 Local

The Project will require statutory development approvals under the relevant local council planning schemes and the *Sustainable Planning Act 2009*. Consultation with local government throughout the EIS process will establish the requirement and extent of these approvals.

The Project may seek a Community Infrastructure Designation (CID) from the relevant Minister that may exempt the project from approval under the local government planning schemes. CID ensures that the site can be protected from encroachment by incompatible development, or that neighbouring development can be managed to avoid or minimise adverse environmental outcomes. This course of action will be confirmed through further consultation with the State and local governments.

RESOURCES

Census of Population and Housing, Basic Community Profile – B42 (2006)

Office of Economic and Statistical Research, Queensland Treasury

www.oesr.qld.gov.au

Economic Potential of Queensland's North West Minerals Province

BIS Shrapnel Pty Ltd on behalf of Townsville Enterprise Limited, Queensland Rail Network and the Port of Townsville

EPBC Act Protected Matters Search Tool (accessed 19 May 2010)

Department of the Environment, Water, Heritage and the Arts

<http://www.environment.gov.au/erin/ert/epbc/index.html>

Future Development of Queensland's Carpentaria Minerals Province, Developing a Resources Corridor – Clean Energy and Minerals (2010)

BIS Shrapnel Pty Ltd on behalf of MITEZ

http://www.mitez.com.au/docs/CopperString Project_devresourcescorridor.pdf

NET Infrastructure Plan 2007-2012 (2007)

Department of Infrastructure and Planning

<http://www.dip.qld.gov.au/plans/northern-economic-triangle-infrastructure-plan.html>

NET Infrastructure Plan Progress Report (2007)

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http://www.dip.qld.gov.au/resources/plan/net/triangle_infrastructure_plan_progress_report.pdf

Road Freight Corridor Study – Flinders Highway, North-West Queensland (2010)

AMSTEC Pty Ltd on behalf of MITEZ

http://www.mitez.com.au/docs/report_flindershighwayroadfreightcorridor.pdf

The Conservation Status of Queensland Bioregional Ecosystems (1999)

Sattler and Williams, Environmental Protection Agency. Brisbane, QLD.

The Sims Review: Providing a circuit breaker to meet North West Queensland's future electricity Needs (2009)

Port Jackson Partners Ltd on behalf of the Queensland Resources Council and Queensland Government

<http://www.dip.qld.gov.au/resources/growth-strategies/sims-review.pdf>