

Powerlink Western Downs Substation

Environmental Impact Statement

Draft Report

Prepared for: Powerlink Pty Ltd

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ABBREVIATIONS AND ACRONYMS

°C	Degrees Celsius
ABS	Australian Bureau of Statistics
AHD	Australian Height Datum
Air NEPM	Commonwealth National Environment Protection (Ambient Air Quality) Measure
Air Toxics NEPM	Commonwealth National Environment Protection (Air Toxics) Measure
ARPANSA	Australian Radiation Protection and Nuclear Safety Agency
ASS	Acid Sulphate Soils
BoM	Bureau of Meteorology
CASA	Civil Aviation Safety Authority
CLR	Contaminated Land Register
CPRS	Carbon Pollution Reduction Scheme
DBH	Diameter Breast Height
DEO	Desired Environmental Outcome
DEWHA	Department of Environment , Water, Heritage and the Arts
DHLGP	Department of Housing, Local Government and Planning (now DLGPSR)
DLGPSR	Department of Local Government, Planning, Sport and Recreation
DME	Department of Mines and Energy
DMR	Department of Main Roads
DERM	Department of Environment and Resource Management
DoD	Department of Defense
DPI&F	Department of Primary Industries & Fisheries
DSM	Demand Side Management
EIS	Environmental Impact Statement
EMA	Emergency Management Australia
EMF	Electric and Magnetic Fields
EMP	Environmental Management Plan
EMR	Environmental Management Register
EPA	Environmental Protection Agency
EPBC	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPC	Exploration Permit Coal
EPP (Air)	Environmental Protection Policy for Air
ERA	environmentally relevant activity
ESAA	Electricity Supply Association of Australia
EWPs	Environmental Work Plans
DIP	Department of Infrastructure and Planning
GHG	Greenhouse Gas
GIS	Geographic Information System
GQAL	Good Quality Agricultural Land
GPS	Global Positioning System
ha	hectare(s)
hrs/d	hours per day
Hz	Hertz

IDAS	Integrated Development Assessment System
IPA	<i>Integrated Planning Act 1997</i>
IRTM	Interactive Resource and Tenure Maps
kg/m	kilogram per metre
km	kilometre(s)
km/h	kilometres per hour
kV	kilovolt(s)
LDR	Low Density Residential area
LPA	<i>Land Protection (Pest and Stock Route Management) Act 2002</i>
LRA	Land Resource Area
LRAM	Land Resource Assessment and Management
m	metre(s)
MPEBD	Maximum Permissible Evident Built Development
mG	milligauss
mm	millimetre(s)
MNES	Matters of National Environmental Significance
MRET	Mandatory Renewable Energy Target
m/s	metre (s) per second
NCA	<i>Nature Conservation Act 1992</i>
NGERS	National Greenhouse and Energy Reporting Scheme
NHMRC	National Health and Medical Research Council
OUM	Office of Urban Management
PAR	Preferred Alignment Report
PAWC	Plant Available Water Capacity
<i>pers com</i>	personal communication
PVC	Poly vinyl chloride
QETC	Queensland Electricity Transmission Corporation
QLD	Queensland
QLUMP	Queensland Land Use Mapping Program
QNI	Queensland New South Wales Interconnector
QPWS	Queensland Parks and Wildlife Service
RE	Regional Ecosystem
SF ₆	Sulphur hexafluoride
SPP	State Planning Policies
TLF	Transmission Loss Factor
TOR	Terms of Reference
UCG	Underground Coal Gasification
UXO	Unexploded Ordinance
V/m	Volts per metre
WDRC	Western Downs Regional Council
XLPE	cross linked poly ethylene

EXECUTIVE SUMMARY

INTRODUCTION AND KEY RECOMMENDATIONS

This Environmental Impact Statement (EIS) presents an assessment for a proposed 275kV/500kV substation in the vicinity of the Kogan Creek Power Station on the Darling Downs near Chinchilla. This “Western Downs Substation” will initially be operated as a 275,000 volts switchyard and be connected via a new transmission line to the existing transmission line between Kogan Creek Power Station and the Braemar Substation. Following establishment, the substation will then be connected to the proposed Halys Substation in the Tarong region via a new transmission line. This line is proposed to be built on partially vacant easements from the Warra to Halys area. The identification of a suitable corridor/route, and the environmental assessment of the connection between the Western Downs Substation and this vacant easement will be the subject of a separate study.

Powerlink Queensland, a Transmission Network Service Provider, is the Project proponent.

From the detail contained within this EIS, it has been demonstrated that the proposed placement of the substation will provide the least overall impact for all of the issues considered.

PROJECT JUSTIFICATION

Through Powerlink Queensland Planning Studies, it is indicated that electricity use in Southern Queensland has exhibited very strong growth during the past ten years and growth is expected to continue over the next ten years.

The existing transfer capability of Powerlink’s network between Central Queensland and Southern Queensland, as well as between Bulli, South West, and South East Queensland, is described by limit equations which dynamically maximise the transmission capability available to electricity market participants at any time. Notwithstanding this, it has been identified that the required power transfer between the Bulli and South West zones will reach the capability of the existing network from summer 2010/11. These limitations can be addressed incrementally until 2012/13 whereby a major augmentation is required between these two zones. In addition to power transfer limitations, fault level limitations at the Braemar substation are forecast to coincide. These will impose limits on the capability of that facility to meet system and security limits.

Powerlink Queensland is required to develop its network to meet the security and reliability standards of the National Electricity Rules, the *Queensland Electricity Act 1994* and the terms of its transmission licence. Powerlink has undertaken an assessment of options and carried out consultation as required by the National Electricity Rules prior to approving the option which has the lowest net present value cost, in accordance with the Australian Energy Regulator’s regulatory test. Under this assessment, it was found that the option which satisfied the regulatory test involved establishment of Western Downs substation by 2012/13.

LEGISLATION AND APPROVALS

Relevant Federal and State legislation, codes and local government planning provisions potentially triggered by the proposed Project have been discussed. In addition, assessment of the relevant approval process and the possible permits, licences and approvals that may be required are also detailed. The substation development is community infrastructure as defined under the *Integrated Planning Act 1997* (IPA) and consequently ministerial designation as 'Community Infrastructure' will be sought.

SUMMARY OF THE DESCRIPTION OF POTENTIAL IMPACTS AND MITIGATION MEASURES

The impact that the proposed Project may have on a range of physical, biological and social environmental factors was analysed and mitigation measures provided, where necessary. The following provides a summary of the main potential impacts and mitigation measures. More detailed mitigation measures have been provided within the EIS and Environmental Management Plan (EMP).

Geology and Soils

The site is located on Kurbarilla sandstone geology and is contained within an ironbark/ bull oak land resource area. All soils on the site are similar from an agronomic and soil chemistry perspective and are characterised by low water holding capacity with increasing salinity and sodicity with depth. Soils are classified as Sodosol (texture contrast soils with a sodic upper B horizon) with the major difference across the site being a varying depth of the surface A horizon (<15cm to 40cm). The site is not classified as Good Quality Agricultural Land. The property is not registered on the Environmental Protection Agency Environmental Management Register or Contaminated Land Register.

The primary issue for the site is the management of the sodic subsoils such that earthworks and construction do not initiate tunnel erosion processes. This will be achieved through firstly applying gypsum to the site before construction begins (soils tests have been conducted and gypsum application rates of 15 t/ha are recommended), and secondly ensure that earthworks are conducted in a manner which limits the exposure of sodic subsoils to water flow where practicable.

Climate and Air Quality

Rainfall in Southern Queensland is considered highly variable and subject to extended periods of drought, followed by intensive rainfall. Maximum temperatures often reach 30°C in the Summer months, and minimum temperatures often fall below 5 °C over Winter. Annual wind data collected by the Dalby Airport weather station indicated that the Project site is typically subjected to prevailing easterly winds for most of the year, with the average wind speed of approximately 12km per hour (BoM, 2009).

The data shows that severe storms (including high winds, hail and inundation with flash flooding) are the most common atypical events for the area. The daily average data collected from the Kogan Creek Whyte monitoring station shows that whilst there were 3 exceedances in ambient guidelines, within the 2008-2009 monitoring period, the objective for PM10 allow for an exceedance on 5 days per annum for environmental values to still be protected.

Due to the rural location of the Project site, dust and odour are not expected to be a significant nuisance to ecologically sensitive areas, or to the neighbouring resident.

Mitigation measures for reducing dust emissions during both the construction and operational phases include reducing the length of unsealed tracks, use of recycled water during construction on high traffic areas and application of mulch on exposed areas during construction.

Hydrology

The site falls within the Condamine- Balonne River Catchment and is located 2.5km west of Kogan Creek, which flows northwards into the Condamine River below the junction with Cooranga Creek. There are no permanent watercourses on the project site. The site is flat with poorly defined drainage lines. There are four small surface storage dams in the vicinity of the site. There are no wetlands identified on the site or any adjoining land. The site is not subject to flood risk from the Condamine River or its tributaries. Groundwater is estimated to be moderately deep (>10m) associated with a regional groundwater system. The site would not be expected to be at risk of groundwater rise or salinity.

Levelling of the site will be conducted in a fashion as to maintain sheet flow of water across the site with the aim of minimising flow concentration.

Fire

Bushfire hazard on the Project site is deemed to be low to medium and the prevailing fire regimes are unlikely to be significantly altered due to the Project. The most probable time for a fire to occur is during construction, however the risk of such an event occurring during this phase of the development is considered low. Mitigation measures such as preparation of a Bushfire Management Plan and use of fire resilient materials during construction where possible, are proposed.

Waste Management

The likely wastes that are to be generated during the construction and operational phases of the Project are outlined and include solid and liquid waste sources. The majority of the wastes for the Project will be from the construction of the new substation. Waste production during the operational phase of the Project will be minimal in comparison and associated with scheduled maintenance activities of the substation facility and easements. Mitigation measures to reduce the risk and potential impact from waste sources are provided.

Flora and Fauna

Flora

An ecological assessment was conducted for the proposed Project site and consisted of a review of relevant literature and field surveys. Existing land uses both on the Project site and within the broader study area have resulted in a disturbance to the vegetation communities on the site. Despite this, there is a significant patch of mapped remnant regional ecosystem (RE) on the Project site. This remnant woodland covers approximately half of the proposed substation site and is mapped as a single polygon containing two REs (RE11.5.1 and 11.5.20). This vegetation is listed as Not of Concern under the *Vegetation Management Act*. In addition to this mapped RE on the Project site, five vegetation communities were also recorded during field investigations. These vegetation communities range from disturbed date palm plantations to Eucalyptus woodlands.

No legislatively significant flora species (i.e. listed under Commonwealth or State legislation) were encountered on the Project site. Of the ten significant species determined by database searches to potentially inhabit the general Project locality, four are considered possible inhabitants based on the availability of potential habitat. Of these species, *Philothea sporadica* has been recorded within the broader landscape surrounding the Project site. Three listed plant species (weeds) declared under the *Land Protection (Pest and Stock Route Management) Act 2002* were identified on the Project site during the field survey.

The proposed Project will result in the clearing of approximately 40 ha of vegetation including approximately 30.5 ha of mapped 'not of concern' Regional Ecosystems. This clearing will also result in the loss of potential habitat for the vulnerable *Philothea sporadica*.

Mitigation measures to address potential impacts on fauna include preparation of a Vegetation Management Plan, temporary fencing constructed around areas of vegetation to be retained and washdown facilities provided to minimise weed spread through vehicular movement.

Fauna

Historical landuse and disturbance of vegetation coupled with naturally occurring variances within the vegetation on the Project site have resulted in a mosaic of different habitat types occurring. The majority of the site is well vegetated and therefore provides habitat for a range of fauna species. Patches of vegetation appear to have been disturbed through historical clearing and while these areas lack the diversity and structure of the majority of the community, fallen timber commonly occurs that provides additional habitat for snakes, skinks and small mammals. The fauna species recorded on the Project site included species which are generally considered to be common however several honeyeater species which are known Eucalypt specialists were also recorded. The more modified habitats across the Project site were preferable habitat for generalist species such as Noisy Miners, Crested Pigeons and Willie-wagtails.

No rare or threatened species were recorded on the Project site during the field survey however nineteen rare or threatened species (four reptiles, eleven birds, three mammals and one fish) are considered as possible inhabitants within the general Project locality. Suitable habitat for these species also occurs throughout the area and broader region.

A number of pest species either occur or are likely to occur on the Project site due to the disturbed conditions both on site and in the broader locality. Three introduced fauna species were identified on the site during the site assessment. It is highly likely that several other pest species also inhabit the site.

Potential impacts of the proposed Project in relation to fauna include loss of habitat, disturbance to fauna habitat during clearing, injury to fauna during clearing/maintenance works, disruption to habitat connectivity and potential fauna mortality due to collision with conductors.

Mitigation measures to address potential impacts on fauna include staged clearing, spotter/catcher presence during clearing, restricted speed limits and rehabilitation of disturbed areas that are outside of the substation footprint.

Land Use

Current and future land use was obtained through observation, consultation and literature research. The Project site encompasses two land parcels owned by one landholder. The site has historically been predominantly used as a grazing enterprise with a small date plantation also present near the existing house. All grazing stock are currently removed from the site. Apart from an existing house, the study site also has four farm dams and remnants of an irrigation system at the date palm plantation. Boundary fences are also in place.

The study area is located within the municipal boundaries of Western Downs Regional Council. On 15th March 2008, Western Downs Regional Council was formed with the amalgamation of Wambo, Dalby Town, Chinchilla, Murilla, Tara and Taroom Shire. Prior to the amalgamation the study area was situated within Chinchilla Shire. The study area is subject to the *Chinchilla Shire Planning Scheme*. The *Chinchilla Shire Planning Scheme* is an *Integrated Planning Act* compliant Planning Scheme.

The Project site is zoned 'Rural' under the Chinchilla Planning Scheme, and does not have any other planning restrictions. There are no specific development provisions that relate to the establishment of a substation, the proposal is unlikely to conflict with the Strategic Directions of the Planning Scheme. Furthermore, the proposal is not considered to compromise the purpose of the *Rural Zone*.

Socio-economic Environment

Key demographic characteristics of the Western Downs Regional Council are described as are existing land use activities within the broader study area.

As the existing landholders are a corporation involved in similar Public Utility activities to what is proposed at the Project site, the current landholders are not anticipated to experience any negative impacts due to the proposed substation development at the Project site. There is currently little social value associated with the Project site, therefore the development of a substation will have no social impact on how the site functions. In addition, the community profile of the surrounding area is not anticipated to be impacted by the development of a substation on the Project site.

As the Project site is vacant, with no existing agricultural or industrial uses, it currently has no economic value contributing to the community, and therefore the development of a substation will have no negative economic impact on how the site functions.

This increase in economic activity that will be established at the Project site will benefit the surrounding community in the region by generating additional employment opportunities and enhancing the overall economic capacity of the Western Downs region. This has the potential to generate indirect community benefits through the additional economic contribution to the region.

Noise and Vibration

The acoustic environment in which the substation is proposed to be situated is currently dominated by the noise of the existing Kogan Creek Power Station (approximately 1.5km to the north-east). Due to the magnitude of the power station, its associated noise is expected to be significant in comparison to the expected noise emanating from the proposed substation. One noise sensitive receptor (dwelling) has been identified from aerial photography and regional investigations. The residential dwelling exists approximately 400m to the immediate west of the proposed substation on the adjacent property.

Noise associated with the Project would mainly arise as a result of the construction phase and would generally be associated with heavy vehicle movements and general construction noise. During maintenance, potential noise sources will include vehicle routine inspections, repairs and vegetation and erosion management activities. Due to the large separation distance, and proposed construction works being carried out during less noise sensitive hours, there is a low potential for noise impacts to occur during the construction phase.

A number of mitigation measures including effective mufflers for trucks and machinery and keeping the public informed of construction and maintenance schedules have been recommended to minimise the potential noise impact of the proposed Project.

EMF

Electric and magnetic fields (EMF) occur in nature, in all living things and as a consequence of anthropogenic sources. Electric fields are caused by voltages (volts) and can be found near any electrical appliance that is switched on at the power outlet. Magnetic fields are caused by the flow of energy (current) through a conductor.

The transmission of electricity via the proposed Project will generate electric and magnetic fields which may raise public health concerns. The recommended exposure levels set by the Australian Government's Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) and the National Health and Medical Research Council (Australia) have been outlined within the EIS along with the predicted EMF levels for the area immediately surrounding the proposed substation.

Whilst it is impossible to model EMF levels from substation sources due to the variability in a number of aspects such as operational and equipment layouts, current flows, local topography and vegetation cover, it is indicated that the EMF levels from the proposed substation will be well within the EMF limits outlined within the ARPANSA 'Draft Radiation Protection Standard: Exposure Limits for Electric and Magnetic Fields' and the NHMRC 'Interim guidelines on limits of exposure to 50/60 Hz electric and magnetic fields'. Moreover, the EMF levels at the closest receptor will be below levels normally found around typical household appliances.

Landscape Character and Visual Amenity

The landscape of the region is characterised by distinctive elements including very low density and generally small scale of development; long straight rural roads with open or filtered views of the rural landscape; the meandering Condamine River, associated floodplains and riparian vegetation; open flat or undulating rural plains with a patchwork of agricultural uses; rolling grazing land and vegetated foothills; and dry eucalypt woodland. The existing house located 400m to the west of the proposed substation location may be impacted.

A large portion of the existing woodland vegetation on the northern portion of the site will be cleared to construct the proposed substation. However, due to the generally flat topography of the region, the scale of the substation development in comparison to the adjacent power station and the screening of the site by existing native vegetation, the proposed substation will have no significant impact on the landscape character of the region and only limited impact upon the landscape character of the local area in the short term.

The existing woodland vegetation to the north and east of the proposed substation site will be retained and along with the position of the existing Kogan Power Station, the site cannot be seen from the Warrego Highway. There are no local viewpoints from which the site is visible. The visual impact of the proposed substation development will be minimal on a regional scale.

Any impact the proposed substation will have on the local landscape character will be minimal in comparison to the existing Kogan Creek Power Station. With the establishment of woodland buffers to the south and west of the site, the permanent facility will have no long-term visual impacts regionally and will have no significant long-term visual impacts locally.

Mitigation measures proposed to help reduce visual impacts from the proposed Project include installation of vegetated buffers, ensuring the removal of existing woodland vegetation outside of the immediate construction site area is minimised and enhancing the existing vegetation buffers by the addition of new plantings of native tree species matching the existing species mix.

Transport Infrastructure and Traffic

The area adjacent to the proposed substation comprises a number of State controlled roads under the management of the Department of Transport and Main Roads (DTMR) and local authority roads under the management of the recently formed Western Downs Regional Council.

A light increase of traffic volumes on the roads adjacent to the substation is expected to occur during the construction phase given the necessary transport of materials, equipment and personnel. Traffic during the operational phase will be minimal except where major works are required.

It is anticipated that the construction vehicles will use the Warrego Highway and Banana Bridge Road to access the site from both the eastern (Toowoomba / Dalby) and western sides (Chinchilla). Some construction vehicles are likely to carry “oversize” loads, which can cause some safety issues for other road users. Vehicle movements related to the maintenance and inspections of the substation are expected to be very low, particularly when compared to those that will potentially occur during the construction phase.

It is proposed that the anticipated route to be used by construction vehicles must be inspected prior to the commencement of the construction works. The access to the substation site must be cleared of any obstacles or constraints and the pavement must be in good condition to ensure that access to the site can be achieved even under periods of wet weather.

Non-Indigenous Cultural Heritage

Whilst the region surrounding Warra has numerous sites and places of cultural heritage significance, there is an absence of significant sites in the vicinity of the substation. The Project is not expected to impact upon areas or objects of social importance or cultural significance. With consideration of the broader context of the area surrounding the Project site (i.e. Kogan Creek Power Station), the proposed development is not expected to have a negative impact on the lifestyle of local residents, or on the appeal of places frequently visited within the region. The likely presence of remnants of cultural heritage has not been dismissed, however.

The impact of the proposed development on matters of cultural significance is expected to be negligible. However, if during construction, historic relics are discovered, work should cease until an appropriately qualified heritage assessor has been afforded the opportunity to assess any objects of possible heritage value, *in situ*.

Powerlink have conducted a separate internal assessment of Aboriginal Cultural Heritage.

Greenhouse Gas Emissions

Greenhouse gas emissions to be generated as a result of this project are considered. Scope 1 emissions (e.g. fuel use) associated with the project total 1,172t CO₂^e. Scope 3 emissions (e.g. embedded energy in construction materials) associated with the project total 1,357t CO₂^e. Mitigation measures to help minimise greenhouse gas impacts as a result of this project include management strategies for site preparation, material selections and transport, plant and equipment and auxiliary emissions.

Environmental Management Plan

An EMP has been prepared to prevent or minimise potential environmental impacts identified by the EIS. Environmental management strategies for the Project’s potential impacts, including control measures and responsible persons, are included in the EMP.

Environmental Cost-Benefit Summary

An environmental cost-benefit summary has been undertaken for the Project. Short and long-term costs and benefits have been examined including:

- Decreased land use impact;
- High conservation areas affected;
- Greenhouse gas emissions; and
- Employment and economic capacity.

The development of a substation on the Project site is considered to have minimal short term and long term environmental impacts both on the Project site itself and within the surrounding area.

The short term economic benefit related to the proposed substation facility will be an estimated 20 to 30 construction related jobs at the Project site. The long term economic benefits will be potentially additional employment related to the ongoing maintenance and operation of the substation facility and an increase in the overall economic value of the region as a result of the operation and industry output of the substation facility.

Summary and Recommendations

A broad range of physical, biological and social environmental factors have been considered by this EIS. Overall it is concluded that while the Project may result in localised impacts on some of the factors investigated, the need for the Project has been adequately demonstrated and all feasible alternatives have been explored. In addition, where relevant, potential issues have been identified, quantified and mitigation measures have been developed/recommended for consideration or adoption during the detailed design phase of the Project. An EMP has also been prepared to prevent or minimise the potential for environmental harm.

Provided Powerlink Queensland follows the recommendations contained within this EIS and associated EMP and continues to work with the community and other stakeholder to further mitigate impacts, there does not appear to be any physical, social or environmental issues that would prevent this Project from being recommended to the Minister for the Department of Employment, Economic Development and Innovation for designation.

1.0 INTRODUCTION

Conics Pty Ltd has been commissioned by Powerlink Queensland to prepare an Environmental Impact Statement (EIS), including an Environmental Management Plan (EMP), for the proposed Western Downs Substation (the Project), in the Kogan district of Western Downs Regional Council (WDRC) (Figure 1.1).

Powerlink proposes to establish and construct a 275kV/500kV substation in the vicinity of the Kogan Creek Power Station on the Darling Downs near Chinchilla. This “Western Downs Substation” will initially be operated as a 275,000 volts switchyard and be connected via a new transmission line between Kogan Creek Power Station and the Braemar Substation. Following establishment, the substation will then be connected to the proposed Halys Substation in the Tarong region via a new transmission line. This line is proposed to be built on partially vacant easements from the Warra to Halys area. The identification of a suitable corridor/ route, and the environmental assessment of the connection between the Western Downs Substation and this vacant easement will be the subject of a separate study.

1.1 PROJECT TITLE

The project has been identified as the Western Downs Substation Establishment and Connection project.

1.2 PROJECT PROPONENT

Powerlink owns, develops, operates and maintains Queensland’s high voltage transmission network that extends 1,700 km from north of Cairns to the New South Wales border. As a Transmission Network Service Provider in the National Electricity Market, and holder of a Transmission Licence in Queensland, Powerlink is required to develop its network to meet the security and reliability standards of the National Electricity Rules, the Queensland Electricity Act 1994 (the Electricity Act), and the terms of its Transmission Licence. In addition to these strong legal obligations, the Australian Energy Regulator has implemented network reliability benchmarks for Powerlink, whereby failure to meet those benchmarks results in financial penalties.

Of particular relevance is Powerlink’s Transmission Licence, which requires Powerlink to develop the network in a timely manner to meet future forecast demands, such that the forecast peak demand can be met, even with the most critical network element out of service. This is known as the N-1 network planning criterion.

Contact details for the proponent are:

Powerlink Queensland
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PO Box 1193, Virginia, Queensland, 4014, Australia
Telephone: (07) 38602111, Facsimile: (07) 38602100
Website: www.powerlink.com.au

Powerlink Queensland is the registered business name of the Queensland Electricity Transmission Corporation Limited, ABN 82 078 849 233.

1.3 SCOPE OF THE ENVIRONMENTAL IMPACT STATEMENT

The scope of this EIS is to investigate potential environmental and social impacts of the proposed substation, as well as undertake community consultation (in conjunction with Powerlink), in accordance with the Terms of Reference (TOR) (Appendix A) and the *Electricity Act 1994*. A TOR checklist is included in Appendix B to ensure all TOR items are addressed in the EIS.

Specifically, this EIS:

- Identifies the environmental (including social and economic) values of the Project site;
- Assesses the potential impact of the Project on these values; and
- Provides recommendations to mitigate any potential impacts resulting from the Project.

It is noted however, that some aspects of the EIS (e.g. the social environment) have a wider potential impact and, as such, require a broader assessment; therefore the scope for such issues is based on the Project Locality area. It should be noted that Aboriginal Cultural Heritage is being assessed separately by Powerlink and therefore does not form part of this EIS.

1.3.1 Objectives of the EIS

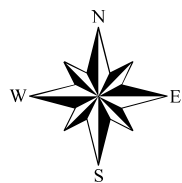
The objectives of the EIS are as follows:

- A description of the relevant aspects of the existing social, economic, nature and built environment;
- To provide information on the proposal and development process to the community and decision makers;
- To comprehensively identify and evaluate all relevant issues associated with the proposal;
- To identify all potential environmental impacts (across the short, medium and long term) of the development;
- To recommend construction, operational, maintenance and decommissioning measure required to minimise or compensate for adverse impacts and enhanced benefits;
- To consult with the community and relevant stakeholders in the process of identifying, assessing and responding to the impacts of the proposal;
- To identify all necessary licences, planning and environmental approvals including approval requirements pursuant to the *Environment Protection and Biodiversity Conservation Act 1999*, *Integrated Planning Act 1997*, *Environmental Protection Act 1994*, *Vegetation Management Act 1999*, and other legislation;
- To provide recommendations on the need for and contents of any environmental management plans and / or operational plans to mitigate adverse effects; and
- To provide an input to the decision-making process, assisting with the determination of whether to accept or modify the proposal, approve it with conditions or carry out further studies.

Powerlink Western Downs EIA Location Map

Figure 1.1

-  330kV
-  275kV
-  Power Station
-  Substation
-  Easements
-  Cadastre



0 1,000 2,000 4,000 6,000 8,000
Meters

Scale 1 : 180 000
Datum / Projection: GDA94 MGA Zone 56



2.0 PROJECT JUSTIFICATION AND FEASIBLE ALTERNATIVES

2.1 PROJECT JUSTIFICATION

Electricity use in Southern Queensland has exhibited very strong growth during the past ten years and growth is expected to continue over the next ten years, due to population growth and the on going uptake of domestic air-conditioning.

Powerlink recognises the importance of maintaining a reliable electricity supply to its customers. Routine planning investigations have been carried out to identify the most appropriate course of action to meet future supply requirements in Southern Queensland.

The existing transfer capability of Powerlink's network between Central Queensland and Southern Queensland, as well as between Bulli, South West, and South East Queensland, is described by limit equations which dynamically maximise the transmission capability available to electricity market participants at any time. Notwithstanding this, it has been identified that the required power transfer between the Bulli and South West zones will reach the capability of the existing network from summer 2010/11. These limitations can be addressed incrementally until 2012/13 whereby a major augmentation is required between these two zones. In addition to power transfer limitations, fault level limitations at the Braemar substation are forecast to coincide. These will impose limits on the capability of that facility to meet system and security limits.

Powerlink has undertaken an assessment of options and carried out consultation as required by the National Electricity Rules prior to approving the option which has the lowest net present value cost, in accordance with the Australian Energy Regulator's regulatory test. Under this assessment, it was found that the option which satisfied the regulatory test involved establishment of Western Downs substation by 2012/13.

Because of the fault level limitations of the Braemar Substation, even the alternative options considered which did not require establishment of Western Downs Substation as early as 2012/13 still required this new substation within a further five years to address the fault level limitations at Braemar Substation.

2.2 FEASIBLE ALTERNATIVES

2.2.1 Options Considered by Powerlink Queensland

2.2.2 "Do Nothing" Option

In proposing this Project, Powerlink has also considered, and rejected on the grounds of Powerlink's mandated legal obligations for reliability, a 'do nothing' option. As previously noted, the expected population growth of South-east Queensland region, and ongoing increased use of air-conditioning, will result in increased load and peak demands. Establishment of further generation capacity within the South West Queensland sector will exacerbate the network limitations described above.

Under the *Electricity Act 1994*, the National Electricity Rules and the terms of its Transmission Licence, Powerlink is obliged to reinforce or augment the existing network where necessary to ensure reliability and quality of supply. The forecast increased electricity demand in the area therefore makes action non-discretionary.

Even if the demand growth proved to be slower than forecast, the identified short-term and long-term network limitations will still emerge, albeit slightly later than forecast. It is therefore strategically prudent (and consistent with the principles of the South-East Queensland Regional Plan) to undertake the required development. A similar conclusion applies if the demand growth proves to be higher than forecast.

2.2.3 Upgrade of Braemar Substation vs Establishment of a New Substation

Fault levels at Braemar substation will approach the operational limits of the substation equipment as additional generators are connected. Technical studies were undertaken to address these limits and assess alternative options within the substation site. These studies indicated that significant disruption and costs would be incurred in upgrading the substation. It was also identified that this may also require the upgrading of equipment within the power stations which were directly connected to Braemar. In consideration of this, it was concluded that the establishment of a substation remote from Braemar would provide the opportunity to manage the fault limits, avoid alterations to existing generators, and also provide an opportunity to marshal further generators. This new substation was identified as Western Downs Substation.

The studies undertaken in line with the Australian Energy Regulator's regulatory test showed that even the higher cost options which considered upgrading Braemar Substation by 2012/13 still required the establishment of a new substation at Western downs within a further five years to address the re-emerging fault level limitations at Braemar Substation.

2.2.4 Alternatives Considered for the location of the Western Downs Substation

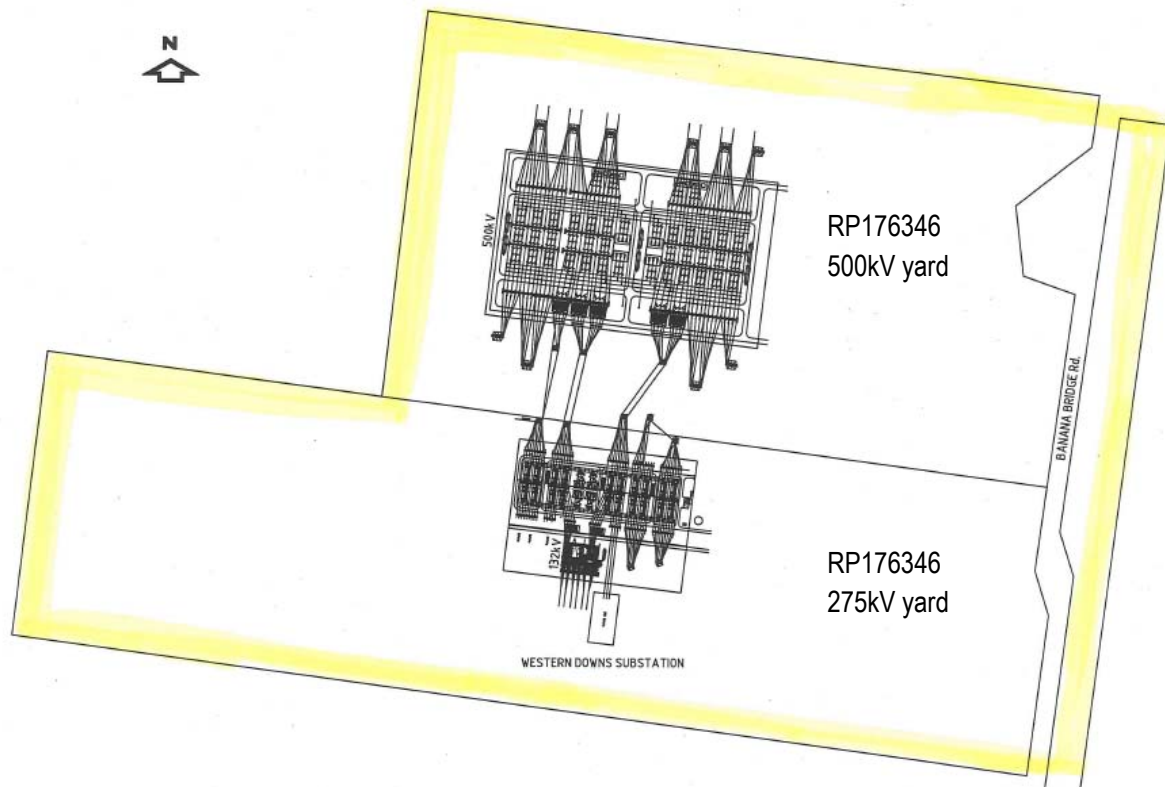
Criteria used to assess suitable substation sites included:

- Maximise distance to Braemar Substation to address fault level issues;
- Close proximity to the Braemar to Kogan Creek transmission line to minimise connection length and an orientation that allows efficient connection to this line and to facilitate current and future requirements for corridor/s towards the QNI and the Halys area;
- Landuse and proximity to residences;
- Environmental impacts and ability to manage/mitigate these;
- Sufficient area for the initial site, rebuild, easement and turn in requirements; and
- A relatively "flat" site to minimise bulk earthworks.

From an operational and fault level perspective, it is necessary to maximise the distance of the Western Downs Substation from the Braemar Substation, and minimise the distance to the Kogan Braemar transmission line. A location adjacent to the Kogan Creek Power Station, in the vicinity of the Kogan Braemar transmission line would provide an optimum solution. The substation would avoid the Tong Park Piggery, the Wilkie Creek coal resource, and the smaller rural residential blocks north of Kogan. This would also avoid the scarps and higher country that occurs in the vicinity of Tong Park, the Kogan Warra Road and the Kogan North Road. The Kogan Creek coal resource and power station infrastructure (ash dam) are located to the east and south of the power station. A substation positioned to the west of the Banana Bridge Road, north, west or south of the power station would minimise the impacts if located in close proximity to this power station infrastructure.

5 potential sites were identified and an assessment undertaken in accordance with Powerlink's Substation Site Selection Policy (AM-POL-0891). This assessment identified a site on the western side of Banana Bridge Road and opposite the ash storage area as the preferred location for the Western Downs Substation (Figure 2.1). A field inspection confirmed this locality as suitable. The site was located on two properties (Lot 3 and Lot 4 on RP176346).

FIGURE 2.1 SUBSTATION SITE LOCATION AND PROPOSED LAYOUT



3.0 PROJECT DESCRIPTION

3.1 PROJECT LOCATION

The proposed Western Downs Substation site and line connection project is located on the Banana Bridge Road at Hopelands, approximately 24km south east of Chinchilla and 64km west-north-west of Dalby on the Darling Downs in Southern Queensland. The site is adjacent to properties containing the Kogan Creek Power Station and associated developments.

The substation site is located within the local authority of the Western Downs Regional Council and the Warrego State Electorate.

Figure 1.1 indicates the Braemar / Kogan Creek / Tarong locality. This area lies within Powerlink's South West Queensland (SWQ) network sector.

3.2 DESCRIPTION OF THE PROPOSED SUBSTATION

The project consists of the development of a substation which in its ultimate form will contain a 275kV switchyard, a 500kV switchyard, transformers for the conversion of power between the two voltages, static var compensator (SVC) units, capacitor banks, overhead structures to support wires and busbars, an oil separation system, control buildings, connections to the transmission network, communications and control systems, access roads and associated infrastructure. The first stage of the development will comprise a 275 kV switch yard and the connection of this facility to the existing Braemar to Kogan Creek 275kV transmission line using double circuit transmission lines supported on steel lattice towers, steel or concrete poles.

The development of any future transmission lines out of the substation site will require the completion of an EIS to identify the routes together with an EIS for the individual line/s.

3.2.1 Substation

An electrical substation is the component of the high voltage electrical supply network where the voltage of incoming bulk supply electrical power is transformed to a higher or lower voltage for transmission purposes. It is a marshalling point for incoming and outgoing transmission lines that provides fault detection and switching facilities for these lines as well as protection and transformation equipment within the substation.

A high voltage substation consists of a number of structures, items of equipment and support services including:

- Various items of electrical equipment circuit breakers, isolators, power transformers and instrument transformers each mounted on individual support structures;
- Circuit breakers which will utilise conventional switchgear pressure sealed and gas insulated (by sulphur hexafluoride - SF₆);
- Capacitor banks and Static Var Compensators for optimizing transmission efficiencies;
- Gantry structures between which are strung conductors to transport power between items of equipment;
- Busbars which transport power from one set of equipment to the next;

- A waste water collection system which incorporates oil separation facilities,
- Access roads,
- Line connections to the transmission network, and
- One or more buildings which house control, protection and communications equipment.

The structures and equipment are set out in 'bays', where one bay is required for each transformer or for each circuit of an incoming or outgoing transmission line.

3.2.2 Line connection to the Kogan Braemar Transmission Line

A 275kV double circuit transmission line will connect the existing Kogan Creek Braemar Transmission line to the Western Downs Substation.

3.2.2.1 Supporting structures

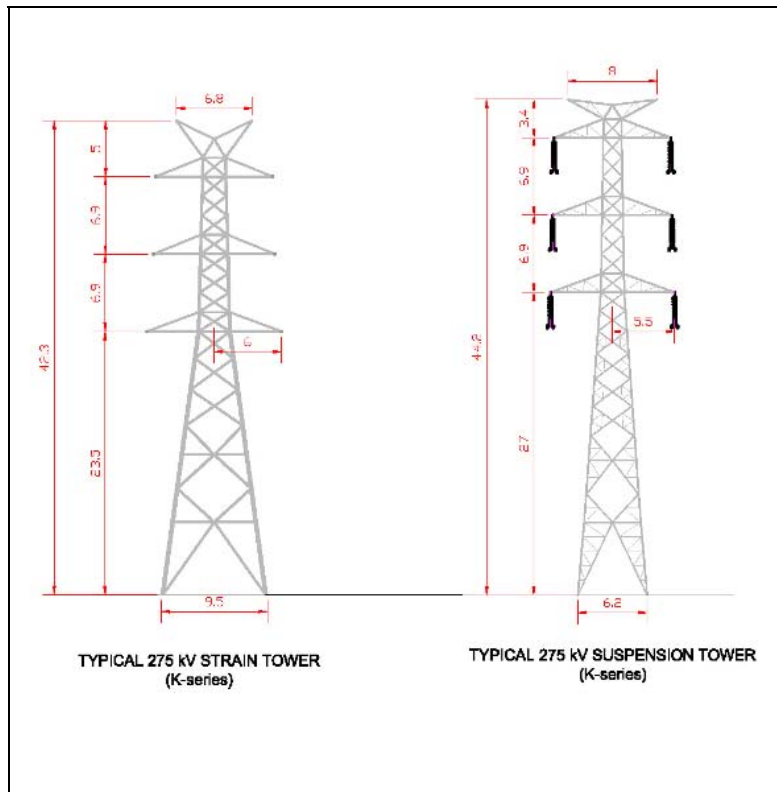
Supporting structures are used to keep the high voltage conductors separate from each other, clear from the ground and other obstacles. Supporting structures can be steel lattice towers, concrete poles or steel poles. The type and materials for the connection to the existing transmission line will be chosen during the detailed design. The individual components for steel lattice towers are fabricated from galvanised steel angle sections (members) and steel plate and these are then bolted together into a 'lattice' structure. Bored, or mass concrete foundations support the four legs of each tower. Tower heights are nominally 42 metres however this can vary depending on the structure spacings and required heights of the lines.

Poles can be constructed from rolled steel or cast reinforced concrete. Line hardware including insulators or cross arms are then bolted to preinstalled flanges at the appropriate height on the poles. Pole foundations can be bored, or mass concrete depending on ground conditions. Poles can be self supporting, or require guy wires. Pole heights are somewhat lower than towers being 20m – 35m.

Outlines of lattice tower designs are illustrated in Figure 3.1.

Minimum clearance requirements between energised conductors and various types of obstacles are specified by the *Electricity Regulation 1994*.

FIGURE 3.1 LATTICE TOWER DESIGNS



3.2.2.2 Conductors

Conductors to be used on the proposed line will be Aluminium Alloy Conductor. The conductors will be approximately 36 millimetres in diameter. Each structure will support twelve individual conductors, in bundles of two, and two earth wires. Electrical continuity on tension structures is provided by 'bridging conductors' which are suspended beneath the crossarms, connecting the terminated conductors on either side of the tower. Where necessary, these conductors are restrained by 'bridging insulators' to maintain electrical clearance.

3.2.2.3 Earth Wires

Two overhead earth wires provide protection to the conductors from direct strike by lightning and are also used as support for optical fibre cables for communications purposes. The optical fibre earth wires will typically be 14 millimetres in diameter with the optic fibre protected within the middle of the cable.

3.2.2.4 Insulators and Other Fittings

Insulators are used to physically attach the conductors to the support structures and to provide electrical insulation between the high voltage of the conductors and the (earthed) structure. The length of the insulators depends on line voltage, clearance requirements and environmental (e.g. pollution) considerations. Special galvanised steel fittings connect both the line end of the insulator to the conductors and the tower end to the structure. Glass or porcelain insulators will be used.

3.3 CONSTRUCTION, MAINTENANCE AND DECOMMISSIONING ACTIVITIES

3.3.1 Construction

Construction of the proposed Western Downs Substation will involve a series of activities including:

- A detailed site survey including geotechnical studies to allow detailed structure and substation design;
- Vegetation clearing;
- Civil Works:
 - Bulk earthworks to achieve the necessary drainage and flood attenuation;
 - Earthwork and levelling for the substation platform and access road;
 - Installation of site drainage system;
 - Installation of substation cable trench and conduit system;
 - Installation of the substation earthing mat;
 - Installation of substation structure and building foundations; and
 - Site fencing;
- Component installation including structures, electrical equipment and control buildings
- Installation of the cabling, operating and control systems;
- Tying in to the existing network; and
- Commissioning.

3.3.1.1 Vegetation Clearing

The proposed location of the substation contains some woody vegetation and is mapped by the Queensland Herbarium as 'remnant, not of concern' (see Section 10.2). It is proposed that the site clearing will be by bulldozer and cleared material will be stacked for later disposal by burning or chipping. The clearing for the line connection may be undertaken by megamulcher to minimize soil disturbance. The clearing strategy and vegetation disposal techniques will be detailed in the Construction EMP.

Revegetation of areas outside the substation footprint will be a consideration to reduce the visual amenity of the site from a nearby residence to the west (see Section 15.2).

3.3.1.2 Civil Works

The civil works involve the installation of substation drainage, roads, cable trenches, substation earthing, structure foundations and security fencing.

Bulk earthworks will be undertaken to prepare the site pad at the required level and grade.

A copper electrical earthing mat is installed across the site at a depth of approximately 600 millimetres. The disturbed soil will then be compacted and covered in road base material to prevent erosion. The overall site is then covered in gravel. Drainage work consists of the installation of all drains, pits and culverts necessary to control the flow of stormwater from the site. The drainage system includes the installation of an oil skimmer to ensure run-off water is not contaminated. All roads into the substation compound and equipment area will be constructed to a standard appropriate for the anticipated loads and traffic flows.

Structure, equipment and building foundations will be bored, excavated, or a combination of both. Bored concrete foundations are used in most situations whilst excavated foundations are used where pad type footings are required. Isolated concrete plinths and foundations will then be constructed to support the site infrastructure. Supply of the concrete for foundations will be from a local commercial batching plant, or a plant established specifically for this project.

The substation will be surrounded by a 2.4 metre-high chainwire security fence, topped with several strands of barbed wire. Gates will be provided to allow entry by authorised vehicles and personnel.

3.3.1.3 Installation and connection of Electrical Equipment and Control Systems

All gantry and support structures are erected using mobile cranes. The busbars and high voltage electrical equipment are then placed in position and all electrical connections made. Conductors are strung between the high-level gantries and connected to the high voltage equipment.

Cables that carry the control and protection signals to the control equipment located in the buildings are then laid and connected. The final connection is that of the transmission lines connecting the substation to the existing network. The substation is then energized and the control systems commissioned. Once the suitability of the substation is confirmed, it is brought on line.

3.3.2 Operation and Maintenance

After the completion of construction and commissioning of the substation, the amount of activity on site will decrease substantially as the substation is designed to be monitored and controlled remotely. For safety and security reasons, only authorised personnel are permitted access to the substation compound. Remotely controlled security cameras will be installed as remote video monitoring of the substation enables a quick response to any issues that may arise.

Facilities exist for manual and emergency site control, should this be necessary. Maintenance staff will carry out routine inspections of the substation and detailed maintenance of all plant equipment at regular intervals. Additional inspections may be required as a result of equipment failure, modifications and upgrades or vandalism. During the routine inspections, all areas of the substation and all items of the plant are assessed. Faults and defects will be reported to maintenance staff who will then rectify any problems identified. Substation equipment is designed with a service life of approximately 40 years and is very reliable under most conditions. Apart from the detailed visual inspections that maintenance staff perform, routine maintenance will be carried out every four to six years depending on the type and make of the plant equipment.

Vegetation regrowth control within the substation compound and under the incoming power supply transmission lines will be undertaken to maintain electrical safety clearances between the conductors and vegetation.

3.3.3 Decommissioning Details

The design lifespan of a substation is in excess of 50 years. This is a nominal period which can be extended by focused, life extending maintenance, upgrades and rebuilds. Should it be determined that decommissioning is required, a comprehensive environmental management plan would be prepared to comply with legislative, environmental, land management and other requirements applicable at that time.

The extent to which the site is rehabilitated would be dependant upon the desired outcomes and proposed future use of the land. Typically, all structures, equipment, buildings and electrical components would be removed for appropriate recycling. Concrete footings would be left in situ, or cut off below ground level with the lower end of the footing remaining in place. Any material which could not be recycled would be disposed of on site (if acceptable), or removed to an appropriate waste disposal facility.

4.0 RELEVANT LEGISLATION, LAWS & APPROVALS

Powerlink Queensland's request for land to be designated by the Minister for Natural Resources, Mines and Energy and Minister for Trade is based on S 2.6.7(1) (a) of the *Integrated Planning Act 1997* (IPA), which provides that the adequacy of the environmental assessment and public consultation about that assessment is presumed to be established if it complies with guidelines made by the Chief Executive under S 5.9.9 of IPA (the Guidelines).

The Guidelines, at section 1.4, require the assessment report to identify assessment requirements, at both State and Federal level, which apply to community infrastructure. Accordingly, this section of the report identifies:

- Relevant State and Federal legislation with implications for community infrastructure;
- Whether , and if so, the extent to which the legislation applies to the Powerlink Queensland Proposal; and
- The bases upon which the Minister can be satisfied that Powerlink Queensland has, or can and will meet its other statutory responsibilities.

4.1 COMMONWEALTH LEGISLATION

4.1.1 Environment Protection & Biodiversity Conservation Act 1999 (EPBC Act)

The Act

Under the assessment and approval provisions of the Commonwealth EPBC Act, actions that are likely to have a significant impact on a Matter of National Environmental Significance (MNES) are subject to a rigorous assessment and approval process. Such an action is described as a 'controlled action'. The seven MNES identified in the Act as triggers for the Commonwealth assessment and approval regime are:

- World Heritage properties;
- National Heritage Place;
- Ramsar Wetlands of International Importance;
- Nationally listed threatened species and ecological communities;
- Nationally listed migratory species;
- Nuclear actions; and
- Commonwealth marine areas.

Application of the Act

Consideration of the potential impacts of the proposed project on MNES have been considered. A summary is provided in Table 4.1. A detailed assessment of the significance of potential impacts on threatened and migratory species is provided in Section 10. It is considered unlikely for the Project to have a significant effect on any MNES from a local or regional perspective. In addition, mitigation measures have been recommended to minimise the potential impacts and therefore the impact of the Project on MNES is unlikely to be significant and therefore is not considered to be a 'controlled action'.

TABLE 4-1 IMPACT OF THE PROJECT ON MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

MATTER OF NATIONAL ENVIRONMENTAL SIGNIFICANCE	IMPACT OF PROJECT
World Heritage Properties	There are no World Heritage Properties within the Project site or in the immediate surroundings.
National Heritage Places	There are no National heritage places within the Project site or in the immediate surroundings.
Wetlands of International Importance (Ramsar wetlands)	There are no listed Ramsar wetlands located within the Project site or in the immediate surroundings.
Threatened Ecological Communities	There are no threatened ecological communities within the Project site.
Listed Threatened Species	No threatened species were recorded within the Project site. Listed threatened species have been recorded within the local area. Details in Section 10.
Migratory Species	No listed migratory species were recorded within the Project site. Listed migratory species have been recorded within the local area. Details in Section 10.3.
Commonwealth Marine Areas	There are no Commonwealth marine areas located in the vicinity of the Project site.
Commonwealth Lands and Heritage Places	There are no Commonwealth lands or heritage places located within the Project site.
Places on the Register of the National Estate (RNE)	There are no places listed on the RNE located within the Project site.
State and Territory Reserves	There are no State forests on the Project site.
Nuclear Action	The Project does not involve any nuclear actions.

Compliance

As there are no MNES associated with the development of the substation, this project will not be referred to the Department of Environment, Water, Heritage and the Arts (DEWHA).

4.1.2 Australian Heritage Council Act 2003

The Act

Indigenous and non-indigenous cultural heritage is regulated under multiple pieces of Commonwealth legislation.

The *Australian Heritage Council Act 2003* provides for the establishment of the Register of the National Estate, which is a list of natural, Indigenous and historic heritage places throughout Australia. However, the Register was frozen on 19 February 2007, which means that no new places can be added, or removed.

On 1 January 2004, a new national heritage system was established under the EPBC Act. The National Heritage List, which is designed to recognise and protect places of outstanding heritage to the nation, and Commonwealth Heritage List, which includes Commonwealth owned or leased places of significant heritage value, are established under the EPBC Act. The listing of a place on the National Heritage List is an MNES under the EPBC Act.

Application of the Act

The Project is not affected by the *Australian Heritage Council Act 2003* or the EPBC Act (in relation to heritage) because there are no listed sites on the land to be designated.

4.1.3 Aboriginal & Torres Strait Islander Heritage Protection Act 1984

The Act

Indigenous cultural heritage is protected by Commonwealth legislation in the form of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* and the EPBC Act.

Indigenous and historic places that are of outstanding heritage value to the nation are included in the National Heritage List established under the EPBC Act. It is an offence under the EPBC Act for a person to take an action that has, will have or may have a significant impact on the Indigenous heritage values of a place listed in the National Heritage List.

The purpose of the *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* is to preserve and protect areas and objects that are of particular significance to Aboriginals in accordance with Aboriginal tradition. Any Aboriginal or Torres Strait Islander person or organisation may apply to the Commonwealth Minister for a temporary or permanent declaration for protection of threatened areas or objects of significance.

Application of the Act

It is theoretically possible that if an application for a declaration is made before the Minister for Natural Resources, Mines and Energy and Minister for Trade makes a decision on Powerlink Queensland's requires for designation, this Act would become relevant. Should that occur the Commonwealth Minister must liaise with the State Minister as to whether there is sufficient protection from threat of injury or desecration for the object/s or area/s under the State's law. This could result in the delay in a decision on the designation.

Compliance

Powerlink Queensland has undertaken a preliminary cultural heritage assessment of the study site to identify any potential areas of objects of significant indigenous cultural heritage and as such is satisfied that is unlikely that a declaration under this Act would be made if one was sought. To minimise the risk of any such application, and to meet its duty of care during construction, Powerlink Queensland is also to develop a Cultural Heritage Management Plan (CHMP) with the relevant Aboriginal Party for the area under the Aboriginal Cultural Heritage Act 2003 (Qld).

4.1.4 Native Title Act 1993

The Act

The *Native Title Act 1993* has the following objectives:

- a) *"To provide for the recognition and protection of native title;*
- b) *To establish ways in which future dealings affecting native title may proceed and to set standards for those dealings;*
- c) *To establish a mechanism for determining claims to native title; and*
- d) *To provide for, or permit, the validation of past acts, and intermediate period acts, invalidated because of the existence of native title".*

Section 24KA of the *Native Title Act 1993* facilitates dealings with land actually or potentially subject to native title (that is, where native title rights and interests have not been extinguished). This section applies to a land dealing that is to be carried out for the provision of facilities for services to the public which includes, inter alia, an electricity transmission facility such as the proposed substation. Dealing under s.24KA does not equate to compulsory acquisition of native title and will result in the 'non-extinguishment principle' applying. The non-extinguishment principle means that during the 'life' of the proposed substation any native title rights and interests are suppressed only to the extent of their inconsistency with the use by Powerlink Queensland of that substation. Should the line ever be decommissioned and removed, any inconsistent native title rights and interests will resurface.

Application of the Act

Lots 3 and 4 on RP176346 within the study site have a current tenure of freehold land and as such native title rights have been extinguished. The Banana Bridge Road within the study site has been registered and properly dedicated and set aside as a road, which has also extinguished native title.

4.2 STATE LEGISLATION & POLICIES

4.2.1 Aboriginal Cultural Heritage Act 2003

The Act

The protection of indigenous cultural heritage in Queensland is governed by the *Aboriginal Cultural Heritage Act 2003*. This Act requires any person who carries out an activity to take all reasonable and practicable measures to ensure the activity does not harm Aboriginal cultural heritage. This is called the Aboriginal cultural heritage duty of care. Compliance with the Aboriginal cultural heritage duty of care can be demonstrated by simply carrying out Cultural Heritage Register searches for minor disturbances to carrying out detailed cultural heritage field assessments and development of a Cultural Heritage Management Plan where there is a high risk of impact.

Application of the Act

The Act applies to the Project and requires Powerlink to comply with its Aboriginal cultural heritage duty of care when constructing, operating and maintaining the works.

Compliance

As part of the Project, a detailed cultural heritage field assessment will be undertaken by Powerlink Queensland across the study site. On the basis of that assessment and in consultation with the relevant Aboriginal Party, Powerlink Queensland will develop a Cultural Heritage Management Plan (CHMP). The CHMP may be approved under the *Aboriginal Cultural Heritage Act 2003*, or constitute an agreement with an Aboriginal Party for the purposes of that Act. Therefore, by doing so, Powerlink Queensland will comply with its Aboriginal cultural heritage duty of care.

4.2.2 Electricity Act 1994

The Act

The *Electricity Act 1994* guides the approval process for the proposed substation. The purpose of the Act is to set out the requirements for all electricity industry participants to follow to ensure a safe, efficient and reliable supply of electricity in an economical and environmentally sound manner. It does this by:

- Authorising Transmission Entities to establish “operating works” (the transmission grid and other property used for operating and managing transmission grid; and
- Requiring Transmission Entities to have regard to the environment when carrying out authorised activities (S31(b)).

Application of the Act

The Project constitutes “operating works” under the Act. The Act requires those responsible for operating works, which involve transmission of electricity to be authorised as “transmission entities”.

Compliance

The Project will comply with the Act because:

- Powerlink Queensland holds a transmission authority, and hence is a transmission entity, the proposed substation is covered by the definition of operating works;
- Industry legal advice is that the EIS is an appropriate process to satisfy the requirements of Section 31(b);
- To the extent that the proposal involves tree clearing:
 - Section 112A of the Act states that clearing of native vegetation on freehold land is classified as “exempt development if the clearing is for operating works for a transmission entity” on land designated a Minister under IPA; and
 - Section 17 of the *Electricity Regulation 2006* provides that an electricity entity may clear trees on non-freehold land if it is necessary to build, maintain or operate an electric line or works if an easement, license or other agreement is in place.

4.2.3 Electrical Safety Act 2002

The Act

This legislation is directed at eliminating the human cost to individuals, families and the community of death, injury and destruction that can be caused by electricity. Accordingly, the purpose of this Act is to establish a legislative framework for:

- Preventing persons from being killed or injured by electricity; and
- Preventing property from being destroyed or damaged by electricity.

Application of the Act & Compliance

As a Transmission Entity, Powerlink Queensland's responsibilities are to implement appropriate safety management systems. It does this to the required standard.

4.2.4 Environmental Protection Act 1994

The Act

The object of this Act is to protect Queensland's environment while allowing for ecologically sustainable development. The Act contains several mechanisms to aid in the protection of the natural environment and imposes a duty of care towards the environment under S 319.

Subordinate legislation to the *Environment Protection Act 1994* includes:

- *Environment Protection Regulation 2008*, Schedule 2 of which defines a number of Environmentally Relevant Activities (ERAs) that require a license or approval; and
- *Environment Protection (Waste Management) Regulation 2000, Environmental Protection Policies for Air, Noise and Water*, which set environmental values and quality objectives for of the receiving environment.

Application of the Act

Although no approvals are currently required from the DERM under *the Environmental Protection Act 1994*, Powerlink Queensland has the following duty of care toward the environment under s.319 of this Act:

"A person must not carry out any activity that causes, or is likely to cause, environmental harm unless the person takes all reasonable and practicable measures to prevent or minimise the harm".

Also a number of the policies are relevant to the proposal.

Compliance

The Proposal complies because:

- The Project takes all reasonable and practical measures to prevent or minimise environmental harm, and so complies with the duty of care prescribed in this Act;
- It is not anticipated that an ERA will be undertaken during the construction and operation of the Project; and
- The requirements of the *Environmental Protection Act 1994* and its policies have been addressed in the EMP.

4.2.5 Integrated Planning Act 1997

The Act

The purpose of the *Integrated Planning Act 1997* (IPA) is to seek to achieve ecological sustainability of development via three main principles:

- Coordinating and integrating planning at the local, regional and State levels;
- Managing the process by which development occurs; and
- Managing the effects of development on the environment.

When considering this request for designation the Minister will be exercising “powers and functions” under IPA, and is therefore required to exercise those functions and powers “in a way that advances the Act’s purpose”.

An important component of Powerlink Queensland’s brief when considering new transmission line projects, is to ensure such projects have been considered in terms of ecological sustainability. “*Ecological sustainability*”, as defined in Section 1.3.3 of IPA:

“...is a balance that integrates:

- a) Protection of ecological processes and natural systems at local, regional, State and wider levels;*
- b) Economic development; and*
- c) Maintenance of the cultural, economic, physical and social wellbeing of people and communities”.*

Furthermore, IPA dictates that the “precautionary principle” should be considered as part of this assessment, that is, lack of full scientific certainty should not be used as a reason for postponing measures to prevent degradation of the environment if there area threats of serious or irreversible damage.

In December 2009, the IPA will be replaced by the *Sustainable Planning Act 2009* (SPA). The SPA retains the key concepts and processes of the IPA, and does not propose any significant changes to the community infrastructure designation process.

In relation to community infrastructure designation, the transitional provisions of the SPA provide that:

- A designation that is in effect under the IPA before the commencement of the SPA will continue as a designation under the SPA. The designation will be taken to have effect on the day it had effect under the IPA (s798 of the SPA);
- If immediately before the commencement of the SPA, a Minister has started the designation process, the Minister may continue the designation under the IPA as if the SPA had not commenced. The designation is then taken to be a designation under the SPA (s799 of the SPA); and
- A guideline issued by the chief executive under IPA (section 5.9.9(1)(a) and (b) (which includes the Guidelines about Environmental Assessment and Public Consultation Procedures for Designating Land for Community Infrastructure (December 2006) and therefore the Powerlink Queensland Manual) continues in effect under SPA. Therefore, the work carried out on the current proposed designation under this EIS can be considered by the Minister in deciding whether to designate the land.

Application of the Act

To ensure the Minister for Natural Resources, Mines and Energy and Minister for Trade is able to meet these IPA (and SPA) obligations when considering new transmission lines projects, Powerlink Queensland must consider each of the matters in sub-paragraph a) to c), and apply the precautionary principle approach where appropriate.

Compliance

Ecologically Sustainable Development

Australia's National Strategy for Ecologically Sustainable Development 1992 (NSEDs) defines ecologically sustainable development (ESD) as:

"using, conserving and enhancing the community's resources so that ecological processes, on which life depends, are maintained, and the total quality of life, now and in the future can be increased".

It is necessary to address the principles in understanding the relationship of the construction and operation of the electricity network in Queensland to satisfy the requirements of the NSEDs overarching goal. These principles are used in the consideration of short, long term and cumulative impacts of the Project and include the following:

- Intergenerational Equity;
- Precautionary approach; and
- Biodiversity conservation.

Together these approaches aim to prevent and reverse adverse impacts of economic and social activities on ecosystems, while continuing to allow the sustainable, equitable development of societies.

Intergenerational Equity

Intergenerational equity is a value concept that focuses on the rights of future generations. It is a concept that is implicit in ecological sustainability. Intergenerational equity is a notion that views the human community as a partnership among all generations. Each generation has the right to inherit the same diversity in natural and cultural resources enjoyed by previous generations and equitable access to the use and benefits of these resources. At the same time, the present generation is a custodian of these resources for future generations and is obliged to conserve this legacy so that future generations may also enjoy these same rights. In this way, intergenerational equity extends the scope of social justice into the future.

Intergenerational equity has little application in the instance of this Project. In this context it may be seen that Powerlink Queensland are responsible for ensuring existing resources are not diminished to the point where they may not be available to future generations. The only resource of significance that is associated with this Project is of the maintenance of freehold land acquired for the Project. The maintenance of the values of this land through the adoption and implementation of an EMP will fulfill the requirement of consideration of intergenerational equity by ensuring that further generations may continue to enjoy the environmental values of the study area.

Further, the proposal extends the sustainable and equitable development of the transmission line network to provide existing and future generations with low cost electricity with minimal impact on the environment.

Precautionary Approach

The precautionary approach was codified for the first time at the international level by the United Nations in 1992 under Principle 15 of the *Rio Declaration on Environment and Development*.

Principle 15 codified the precautionary approach, which indicates that lack of scientific certainty was no reason to postpone action to avoid potentially serious or irreversible harm to the environment. Central to Principle 15 is the element of anticipation, reflecting a requirement that effective environmental measures need to be based upon actions which take a long-term approach and which might anticipate changes on the basis of scientific knowledge.

Powerlink Queensland have adopted the precautionary approach in considering short, long-term and cumulative impacts in the design, construction, operation/maintenance and decommissioning phases of this Project. The consideration of potential impacts both now and in the future has been demonstrated in the adoption of an EMP for this Project which sets out future monitoring, reporting and mitigation actions to be followed for various elements including environmental, physical and social considerations. The adoption of the EMP (and other Powerlink Queensland environmental standards and strategies) allows for the element of anticipation and includes future actions to be taken on the basis of improved knowledge and data.

Biodiversity Conservation

Biodiversity conservation is a cornerstone of many legislative and planning instruments/strategies. Biodiversity conservation requires the considerations of not just immediate organisms and their habitat, but also the consideration of long term and cumulative impacts, and impacts that may be 'off-site' but caused by interactions occurring within the project area.

There is limited potential for the substation and relocated transmission lines to have any impacts on biodiversity conservation. The study site has been chosen on the basis of a number of attributes, including biodiversity values, which were considered in the original Site Selection Report and other previous internal planning documents for the Project.

The potential for off-site impacts on biodiversity is limited to the erosion and sedimentation of these areas that may arise should erosion and sediment controls as outlined in the EMP not be implemented or fail.

There are two options available under IPA for obtaining planning approval for the Project. These are via either the integrated development assessment system (IDAS) as set out in Chapter 3 of IPA or through the designation of land for community infrastructure in Chapter 2 Part 6 (Chapter 5 of the SPA). A comparison of these options is provided in Section 11. Section 2.6.5 of IPA (s203 of the SPA) makes development under a designation exempt development to the extent it is assessable against local government planning schemes.

The designation of land for community infrastructure is the preferred planning process for this Project as it is a more streamline process enabling certainty of timely commencement of the required infrastructure.

4.2.6 Sustainable Planning Act 2009

The Act

The *Sustainability Planning Bill 2009* (SPB) was enacted as the Sustainable Planning Act 2009 (SPA) on the 22 September 2009. The date upon which the SPA is to commence is yet to be proclaimed. Once the SPA comes into force it will replace the Integrated Planning Act 1997 (IPA).

The 'Purpose of the Act' for both IPA and SPA is seeking to achieve ecological sustainability. Part 2 of both IPA and the SPA contain the provisions through which the Acts seek to advance the purpose of ecological sustainability. Broadly speaking, SPA reiterates the criteria currently contained in Part 2, Section 1.2.1 of the IPA, with the inclusion that the process by which development takes place ensures the process is "...is accountable, effective and efficient and delivers sustainable outcomes;".

The criteria for advancing the Act's purpose remains consistent between both the IPA (Section 1.2.2) and SPA (Section 4(1)). Similarly, Section 5 of the SPA and Section 1.2.3 of the IPA outline what advancing the Act's purpose includes and comparatively these sections remain consistent except for the inclusion of examples such as the effects of development on climate change.

Application of the Act

Section 799 of the SPA states that where the Minister has started the process under IPA before IPA is repealed, the Minister may continue to assess the designation under IPA as if the SPA had not commenced. If the Minister does not start the designation process before IPA is repealed, SPA will apply to it. As the timing for the commencement of the SPA is unknown at the time of writing, consideration has been given whether the outcomes of the EIS would be affected by the commencement of the SPA.

Compliance

The community infrastructure designation process set out in Chapter 5 of the SPA is substantively the same as under the IPA. In particular, Section 201 & 207 of the SPA and Section 2.6.2 & 2.6.7 of the IPA respectively, are identical with the exception of section references and the inclusion of guidelines arising from the new numbering structure adopted for the SPA.

It is noted that the “Guidelines about Environmental Assessment and Public Consultation Procedures for Designation Land for Community Infrastructure” and any associated regulations have not yet been made available, so the matters which the Minister might be required to consider under those particular instruments is not yet known. However, Section 846 of the SPA provides that a guideline issued by the Chief Executive under IPA (Section 5.9.9(1)(a) and (b)), which includes the Powerlink Manual, continues in effect under the SPA. As such, the EIS prepared to support the current proposed designations, does not need to be amended prior to lodging an application with the Minister as, under the SPA, (Section 207(3)), an adequate environmental assessment and public consultation process has been undertaken in accordance with the Powerlink Manual.

Despite this, it is anticipated that the SPA Regulations are unlikely to be amended from that of the current regulations. Given the consistency of the provisions between the IPA and SPA, the conclusions provided by the EIS are therefore considered to be applicable to both the IPA and the SPA with regards to the matters the Minister must consider before designating land.

The Project's compliance with the purpose of IPA and SPA in achieving ecological sustainability has been discussed in the above section (Section 4.2.5). Section 5 of SPA outlines what advancing the Act's purpose includes, which is comparatively the same with IPA with the exception of the inclusion the effects of development on climate change. The EIS has contemplated matters pertaining to climate change and the potential impacts the Project may have on climate change. Particular consideration has been given to sea level rises, flooding and storm surges and Greenhouse Gas Emission (Sections 8.3.2 and 12.1.1). Therefore, it is a fair conclusion that the outcomes contained in the EIS will satisfy both the IPA and the SPA, with respect to pursuing the purpose of the Act – Ecological Sustainability.

4.2.7 Land Title Act 1994

The Act

The *Land Title Act 1994* provides a framework for the allocation of State land as either leasehold, freehold or other tenure. Under Chapter 4, Part 4 of the Act, a permit to occupy is required from the chief executive of the Department of Environment & Resource Management (DERM) (formerly Department of Natural Resources & Water) where the proposed alignment is developed on unallocated State land, a reserve or a road. However, Sections 101 and 102 of the *Electricity Act 1994* provide exemptions to the *Land Title Act 1994* allowing electricity entities to undertake necessary actions on road reserves and publicly controlled places such as Unallocated State Land (USL).

Application of the Act

The proposed substation site is currently owned by Powerlink Queensland and no permits are required to construct or operate the works. All existing easements within State owned land will be retained.

4.2.8 Land Protection (Pest & Stock Route Management) Act 2002

The Act

One of the dual aims of the *Land Protection (Pest & Stock Route Management) Act 2002* is to provide a framework for developing pest management plans for various land types.

Application of the Act

In accordance with the Act, Powerlink Queensland must take reasonable steps to keep land free of Class 1 and Class 2 pests as defined under the Act during the construction and maintenance of the proposed substation and relocated transmission lines.

Compliance

The EMP will need to adequately address management of such pests during construction and maintenance activities. All vegetation management activities will be carried out in accordance with Powerlink Queensland's policies and procedures for controlling weed spread and pest management.

4.2.9 Nature Conservation Act 1992

The Act

The objective of the *Nature Conservation Act 1992* (NCA) is to 'conserve nature' through conservation strategies such as dedicating and declaring protected areas for those parts of Queensland with outstanding biological diversity, natural features and wilderness values. The Act also provides for the protection of rare, vulnerable and endangered animals and plants and declared protected areas.

Application of the Act

No protected areas are known to exist in the study site and no listed species under the NCA were detected during the site investigation (Section 10).

The Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006- 2016 (KCP)

The Act

The KCP replaced the Interim Guideline: Koalas and Development that was released under the Regional Plan. The KCP is in accordance with Section 112 of the NCA. The KCP maps areas of Koala habitat as Koala Conservation Area, Koala Sustainability Area or Urban Koala Area. Under the KCP, the state is divided into three districts (A, B and C). Tighter development controls apply in South East Queensland, where the *South East Queensland Koala State Planning Regulatory Provisions* apply (to be replaced by a State Planning Policy at the end of 2009).

Application of the Act

Kogan is included in 'District C'. Although evidence exists that Koalas are declining within this district, the Koala is classified as 'of least concern wildlife' under the *Nature Conservation Act 1992* in areas other than the south-east Queensland bioregion as the threat to Koalas survival is generally perceived to be lower. Policies listed under the Koala Plan that relate to translocation, sequential clearing and spotter catcher requirements still need to be considered and are addressed in the EMP.

Compliance

No requirements are imposed on Powerlink Queensland in relation to koala protection for the Project, so the Project complies with the Plan and the State Regulatory Provisions.

4.2.10 Plant Protection Act 1989

The Act

The *Plant Protection Act 1989* regulates the control, removal and movement of plant pests, diseases, infestations, infections and conditions within and external to Queensland.

Application of the Act

Of specific applicability to the proposed development of the site are the movement controls for Fire Ant infected areas, which form a part of this Act and its associated regulations. Fire Ants (*Solenopsis invicta*) are a serious exotic pest which can be spread easily if movement controls are not implemented in infected areas.

Compliance

The Restricted Area Search Engine provided by the QPI&F provide maps of the restricted areas for Fire Ants. The project site does not fall within a restricted area for Fire Ants. Although no permits from the DEEDI will be required, consideration is to be given on the movement (particularly out of the site) of extracted or waste soil, retaining soil, sand, turf, plant material or mulch / green waste / fuel and the potential for these material to contain Fire Ants. These aspects are addressed in the EMP.

4.2.11 Queensland Heritage Act 1992

The Act

European cultural heritage derives State protection pursuant to the *Queensland Heritage Act 1992*. This legislation protects those areas that are considered to be of State significance and are placed on the 'Queensland Heritage Register', which is administered by the Queensland Heritage Council. For these areas, approval of the Heritage Council is required if any development is proposed. The Council will only approve destruction or substantial reduction of the significance of a registered place, if there is no feasible and prudent alternative to the development.

If there is a feasible and prudent alternative to the development, the Minister administering the Act can issue a 'Stop Order' (s.88) either stopping or prohibiting any work or activity that may destroy or reduce the cultural heritage significance of an area. This Act also protects 'archaeological areas and objects' and 'protected areas of cultural heritage significance'.

Application of the Act

The proposed Project will not interfere or develop any registered places of significance as listed on the Australian and Queensland Heritage Register (Section 17).

4.2.12 State Planning Policies

The Policies

A State Planning Policy (SPP) is an instrument that is made by the Minister, about matters of State interest.

Application of the Policies

The following State Planning Policies are considered to be relevant to the Project:

- SPP 1/92 "Development and the Conservation of Agricultural Land";
- SPP 1/02 "Development in the Vicinity of Certain Airports and Aviation Facilities";
- SPP 2/ 02 "Planning and Managing Development involving Acid Sulfate Soils";
- SPP 1/03 "Mitigating the Adverse Impacts of Flood, Bushfire and Landslide";
- SPP 1/07 "Housing & Residential Development"; and
- SPP 2/07 "Protection of Extractive Resources and Guidelines (and petroleum and mining leases)".

Compliance

An assessment of the relevant State Planning Policies has been undertaken in the Section 11, which states that the Project does not conflict with the key principles of these State Planning Policies.

4.2.13 Transport Infrastructure Act 1994

The Act

The objective of the *Transport Infrastructure Act 1994* is to allow for effective planning and efficient management of transport infrastructure. In particular, this Act deals with the management of roads of National and State importance.

Under s.33, s.50 and s.62 of the Act written approval is required:

- To interfere with a State-controlled road or its operation;
- To construct and / or maintain ancillary works and encroachments (e.g. overhead structures) on State-controlled roads; and
- For the location at which access between private land and a State-controlled road is permitted.

Application of the Act

The proposed Project will not interfere with any State or National roads (Section 16).

4.2.14 Vegetation Management Act 1999

The Act

The purpose of the *Vegetation Management Act 1999* (VMA) is to regulate the clearing of native vegetation in a way that, amongst other things, conserves remnant regional ecosystems, ensures the clearing does not cause land degradation and prevents loss of biodiversity.

The VMA operates in conjunction with the IPA to regulate the clearing of native vegetation. Under Schedule 8 of IPA, clearing of native vegetation is assessable development (which means a development permit for operational works for vegetation clearing) unless an exemption applies.

On 6 October 2009, the *Vegetation Management and Other Legislation Amendment Bill 2009* was introduced in Parliament. The Bill proposes amendments to the VMA. The amendments primarily relate to the regulation of clearing of high value regrowth vegetation and regrowth vegetation within 50m of identified watercourses. Once the Bill is passed, the amendments will be taken to take effect from 8 October 2009. Accordingly, the VMA will regulate clearing of both remnant vegetation and regulated regrowth vegetation. The 'specified activity' exemption under Schedule 8 of IPA is the relevant exemption for this Project. The introduction of this Bill has occurred in the final phases of the Draft EIS and is therefore not discussed in detail. Further consideration of the Bill and the implications on the Project will be provided in the Final EIS.

Application of the Act

Vegetation clearing associated with the proposed Project will be considered a 'specified activity', if it is "an activity under:

- The *Electricity Act 1994*, section 101 or 112A; or
- The *Electricity Regulation 2006*, section 14".

Section 112A of the *Electricity Act 1994* provides that carrying out clearing of native vegetation on freehold land is exempt development if the clearing is for operating works for an electricity distribution entity on land designated for the operation works by a Minister.

Section 17 of the *Electricity Regulation 2006* provides that an electricity entity may clear, lop or prune trees growing on non-freehold land if:

- It is necessary to do so to build, maintain or operate an electric line or works on the land; and
- The entity holds the benefit of an easement, license or other agreement in relation to the line or works (whether or not the easement, license or agreement authorises the clearing, lopping or pruning).

Compliance

As the preferred assessment process for the development of the proposed substation is via Ministerial designation as community infrastructure, vegetation clearing on freehold land (designated for community infrastructure) required for construction would be considered exempt development on the basis that it is a 'specified activity'.

4.2.15 Vegetation Management (Regrowth Clearing Moratorium) Act 2009

The Act

The purpose of this Act is to protect both regrowth vegetation that is an endangered regional ecosystem in rural areas across the State on freehold and leasehold land and riparian regrowth vegetation in the Burdekin, Mackay, Whitsunday and Wet Tropics catchments. This is to be achieved by mainly restricting clearing of the endangered regrowth vegetation and riparian regrowth vegetation for a period of at least 3 months, but no more than 6 months while the State consults with stakeholders about the optimum way to regulate clearing of regrowth vegetation under the VMA. The moratorium commenced on 8 April 2009 and has recently been extended to October 2009.

Application of the Act

Construction of the substation will not will involve the clearing of any endangered regrowth vegetation.

4.2.16 Water Act 2000

The Act

The *Water Act 2000* was introduced to reform water resource management in Queensland. Under s.808 of the Act, "A person must not take, supply or interfere with water under this Act unless authorised under this Act to take, supply or interfere with water". Catchment areas are also protected under the *Water Act 2000* to regulate developments within the catchment to prevent unacceptable impacts on water quality adjacent to major storages.

Under s266 of the *Water Act 2000*, a Riverine Protection Permit is required from DERM to:

- Destroy vegetation in a watercourse;
- Excavate in a watercourse; and
- Place fill in a watercourse.

The Act provides for making of guidelines by DERM by which nominated entities can carry out activities in watercourses, lakes or springs without the need for a permit under S269 of the Act, provided the guidelines are complied with. The guideline provides that where it is proposed to destroy an area of native vegetation greater than 2ha or excavate or place fill to a volume greater than 5,000m³, the Entity should notify the local office of DERM at least 5 business days before commencement of the activity.

This guideline does not remove the requirement to obtain the consent of the owner(s) of land adjoining the watercourse, lake or spring, if necessary, or provide the right of access across other land to the watercourse, lake or spring. Nor does the guideline apply to activities in a Wild River area declared under the *Wild Rivers Act 2005*; and springs in which the water is connected to artesian water, or sub-artesian water within the area covered by the Water Resource (Great Artesian Basin) Plan 2006.

In addition to the above, where waters are to be taken from a watercourse, lake or spring or underground water, for example for use in dust suppression during construction works, a permit to take water would be required pursuant to S 237 of the *Water Act 2000*. No exemptions apply to the taking of water. Construction of access track across waterway (if required) also requires approval under the Act.

Application of the Act

Powerlink Queensland is identified as an 'Entity' under the DERM 'Guideline – Activities in a watercourse, lake or spring' and as such does not require a permit under S 269 of the Act provided it meets the guidelines.

The study site is not located in an area declared as a 'catchment area' under the *Water Regulation 2002*. Therefore it is not anticipated that any for approvals will be sought under the Act.

4.3 LOCAL GOVERNMENT PLANNING SCHEMES & LOCAL LAWS

Once a community infrastructure designation has been made, the local planning scheme provisions do not apply to assessable or self assessable development under IPA or to the reconfiguration of a lot (S 2.6.5 of IPA). However consideration of the local planning scheme is required when deciding whether a designation for this purpose should be made (see Guidelines made under S 2.6.7 (1) (a) of IPA).

Under IPA, a local government must make a planning scheme which is an instrument that identifies the desired environmental outcomes for the area and outlines the measures for achieving these outcomes (including development assessment). The applicable Local Government's (Western Downs Regional Council) Planning Scheme is the *Chinchilla Shire Planning Scheme*, which was prepared under IPA and came into effect on the 30 June 2006.

A detailed review of this Planning Scheme is provided in Section 11 of this document, which provides a planning review and assessment of the Statutory and Strategic Planning provisions of the Planning Scheme. An evaluation of the Planning Scheme provisions was also undertaken and a summary these provisions for the proposed Project within the study site are provided below in Table 4.2.

The Town Planning Investigation concludes that the Project is generally consistent with the provisions of the Chinchilla Shire Planning Scheme. Assessment against the Chinchilla Shire Planning Scheme provisions confirm the Project presents low impacts and has minimal conflicts with the Desired Environmental Outcomes and overall planning code outcomes, but nonetheless still triggers planning approval.

TABLE 4-2 SUMMARY OF THE CHINCHILLA SHIRE PLANNING SCHEME PROVISIONS FOR THE STUDY SITE (CONICS, 2009)

ZONING	USE DEFINITION	LEVEL OF ASSESSMENT	APPLICABLE OVERLAY & DEVELOPMENT CODES	COMPLIANCE ASSESSMENT
Rural	Public Utility	Code	Rural Zone Code	Not considered consistent with the Rural Zone. Generally consistent with the Desired Environmental Outcomes of the Chinchilla Shire Planning Scheme & the Rural Zone Code Purpose

4.3.1 Local Laws

Under the *Local Government Act 1993*, a local government may make local laws for the good rule and government of, its local government area. Community infrastructure designation under IPA does not exempt an entity from the need to comply with local laws. There are no Local Laws relevant to this Project. Therefore, approval is not required from the Western Downs Regional Council under a Local Law. A detailed review of Council's Local Laws is as follows.

The Western Downs Regional Council was formed on the 15th March 2008 and includes the former:

- Chinchilla Shire Council;
- Dalby Town Council;
- Murilla Shire Council;
- Tara Shire Council; and
- Wambo Shire Council.

All the local laws and policies of these former authorities continue to apply within the former local government areas until they are amended by the new Council. Table 4.3 outlines the local laws that are applicable to the former Chinchilla Shire Council area in which the study site is located:

TABLE 4-3 APPLICABLE LOCAL LAWS

LAW NAME	LAW TYPE	LAST AMENDED DATE
03 - Libraries	Local Law	20/10/1994
03 - Libraries	Subordinate Local Law	18/02/1999
05 - Cemeteries	Subordinate Local Law	20/05/1999
05 – Removal of Buildings	Local Law	17/01/1981
07 – Parks & Reserves	Local Law	15/04/1999
07 – Parks & Reserves	Subordinate Local Law	20/05/1999
10 – Water Meters	Local Law	18/03/1999
10 – Water Meters	Subordinate Local Law	18/03/1999
11 - Roads	Local Law	20/05/1999
11 - Roads	Subordinate Local Law	20/05/1999
13 – Gates and Grids	Local Law	15/12/1999
13 – Gates and Grids	Subordinate Local Law	15/12/1999
14 – Commercial Use of Roads	Local Law	15/04/1999
14 – Commercial Use of Roads	Subordinate Local Law	15/04/1999
16 – Temporary Homes	Local Law	16/05/1996
16 – Temporary Homes	Subordinate Local Law	19/11/1998
17 – Keeping Control of Animals	Subordinate Local Law	16/05/2002
18 – Domestic Water Carriers	Local Law	15/08/1996
18 – Domestic Water Carriers	Subordinate Local Law	17/12/1998
19 – Control of Pets	Local Law	15/08/1996
19 – Control of Pets	Subordinate Local Law	19/09/1996
20 – Control of Nuisances	Local Law	18/09/1997
21 – Riding Cycles on Footways	Local Law	17/09/1998
21 – Riding Cycles on Footways	Subordinate Local Law	17/09/1998
23 – Swimming Pools	Local Laws	20/05/1999
24 – Camping Grounds	Local Law	20/05/1999
24 – Camping Grounds	Subordinate Local Law	20/05/1999
27 – Rental Accommodation with Shared Facilities	Local Law	17/06/1999
27 – Rental Accommodation with Shared Facilities	Subordinate Local Law	17/06/1999
29 – Control of Advertising	Local Law	15/04/1999
29 – Control of Advertising	Subordinate Local Law	15/04/1999
37 – Saleyards	Local Law	20/05/1999
42 – Levee Banks	Local Law	05/06/1982

An assessment of the above policies has been undertaken against the project and found that none of the above policies are applicable.

4.4 ASSESSMENT & APPROVAL PROCESS

As discussed in the Section 11 below, although the proposal can also be assessed under the requirements of the Chinchilla Planning Scheme, infrastructure projects of this magnitude are usually assessed under the provisions for designating land as Community Infrastructure by the Minister (Part 6, Division 1, IPA (Chapter 5 of the SPA)) as this process provides approval in the most efficient manner. The Ministerial Designation process is outlined in Section 11.0 along with a designation checklist.

A list of possible licenses, permits and approvals that may be required for the Project is provided in Table 4.4 below.

TABLE 4-4 LICENCE, PERMIT & APPROVAL THAT MAY BE REQUIRED

LEGISLATION	RESPONSIBLE AUTHORITY	ACTIVITY WHICH TRIGGERS LEGISLATION	LICENCE / PERMIT / APPROVAL REQUIREMENTS
Commonwealth Legislation			
<i>Environment Protection & Biodiversity Conservation Act 1999</i>	DEWHA	If works are likely to have a significant impact upon listed Matters of National Environmental Significance (MNES) (namely in relation to nationally listed threatened and migratory species).	The proposed Project has been referred to DEWHA
<i>Native Title Act 1993</i>	Attorney-General's Department	Suppression of native title rights and interests that are inconsistent with the easement conditions. (Note that native Title has been extinguished in this instance)	Procedural requirements to be carried out on non-freehold land.
State Legislation			
<i>Electricity Act 1994</i>	QME	- Clearing exemptions; - Environmental effects of the activity (i.e. the proposed Project).	Approval required for operational works (as defined by the <i>Electricity Act 1994</i>).
<i>Integrated Planning Act 1997</i>	DIP-LG	Designation of land for Community Infrastructure.	Approval required <i>Integrated Planning Act 1997</i> .
<i>Land Act 1994</i>	DERM	Creation of easements.	Registration of easements.
<i>Nature Conservation Act 1994</i>	DERM	Clearing native vegetation and works within protected areas and affecting listed species.	Permit required for clearing native vegetation and potentially interfering with any listed species.
<i>Plant Protection Act 1989</i>	QPI&F	Movement (particularly out of the site) of extracted or waste soil, retaining soil, sand, turf, plant material or mulch / green waste / fuel.	Advice from the DPI&F is to be sought.
<i>Transport Infrastructure Act 1994</i>	DTMR	- Crossing and use of road reserves; - Possible interference with the operation of a State-controlled road; and - Development on land completely or partly in a public transport corridor.	Approval / Agreement required.
<i>Vegetation Management Act 1999</i>	DERM	Clearing of mapped remnant vegetation within substation footprint and along the re-aligned easement.	Approval not required if the 'specified activity' exemption applies.
<i>Water Act 2000</i>	DERM	Watercourse crossings & riparian clearing.	Approval to be obtained as necessary

5.0 LAND

5.1 METHODOLOGY

The method for conducting the EIS for the land section of this report was in two stages; a literature review and a field investigation.

The following literature applicable to the site was identified and reviewed:

- Spatial data sources (GIS framework provided with Searle *et al*, 2007; Maher, 1996) were reviewed to consider topographic, geologic and soils characteristics likely to exist on site;
- Maher 1996 and Searle *et al*, 2007 were reviewed for factors which were likely the major issues such as sodicity and salinity;
- A search of the DERM Interactive Resource and Tenure Maps for active mining or exploration leases; and
- A search of the Environmental Management Register/Contaminated Land Register (EMR/CLR) database to check if lots on the project site are registered as contaminated.

A field investigation was undertaken during the 9th, 10th and 11th of September by a Soil and Hydrology Scientist. The investigation included:

- A reconnaissance of the entire project site looking for variation in soils characteristics based on surface condition and comparing the site with mapping;
- An inspection of the site for any likely contaminating activities (existing and historic) i.e. old cattle dips, land fill sites etc;
- Strategic soil sampling to test for sodicity and nutrient status to inform rehabilitation/revegetation; and
- Analysis of soils results to determine requirements for soil amelioration rates (e.g. gypsum to counteract sodicity and fertiliser rates for revegetation).

5.2 TOPOGRAPHY/GEOMORPHOLOGY

5.2.1 Existing Environment

The project site is on a flat elevated plain that falls uniformly from North to South, with an average slope of less than 0.5%. The site at its highest point has an approximate elevation of 336m AHD in the North-East corner, and at its lowest, 325m AHD in the South-East corner. Slopes increase in the South-East corner of the site up to 2.5%, sloping South-East (see Figure 5.1).

During the field investigation the site was observed to be poorly drained, most likely outwash plains derived from laterised sandstone (Maher, 1996), with poorly developed drainage lines. There are no permanent watercourses on the project site however, there is a poorly defined drainage line in the South-East corner named Paddy Gully (see Figure 5.1). This drainage line was not observed to have bed or banks within the extents of the project site. Paddy Gully drains east from the site approximately 2.5km to join Kogan Creek, a tributary of the Condamine River; which flows northwards into the Condamine River, below the junction with Cooranga Creek.

5.2.2 Potential Impacts

Levelling of the substation platform and associated infrastructure will result in minimal changes to the topography of the Project site as the site is already very flat and will require minimal earthworks.

Major diversion of water is unlikely however there may be minor changes to drainage patterns on the site to divert water flows around the substation platforms. However, as the existing drainage lines are poorly defined, minor diversion of waters are unlikely to change geomorphologic processes. Potential impacts on water flows and hydrology are further discussed in Section 7.

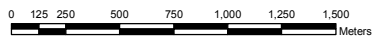
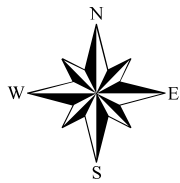
Powerlink Western Downs EIA

Topography

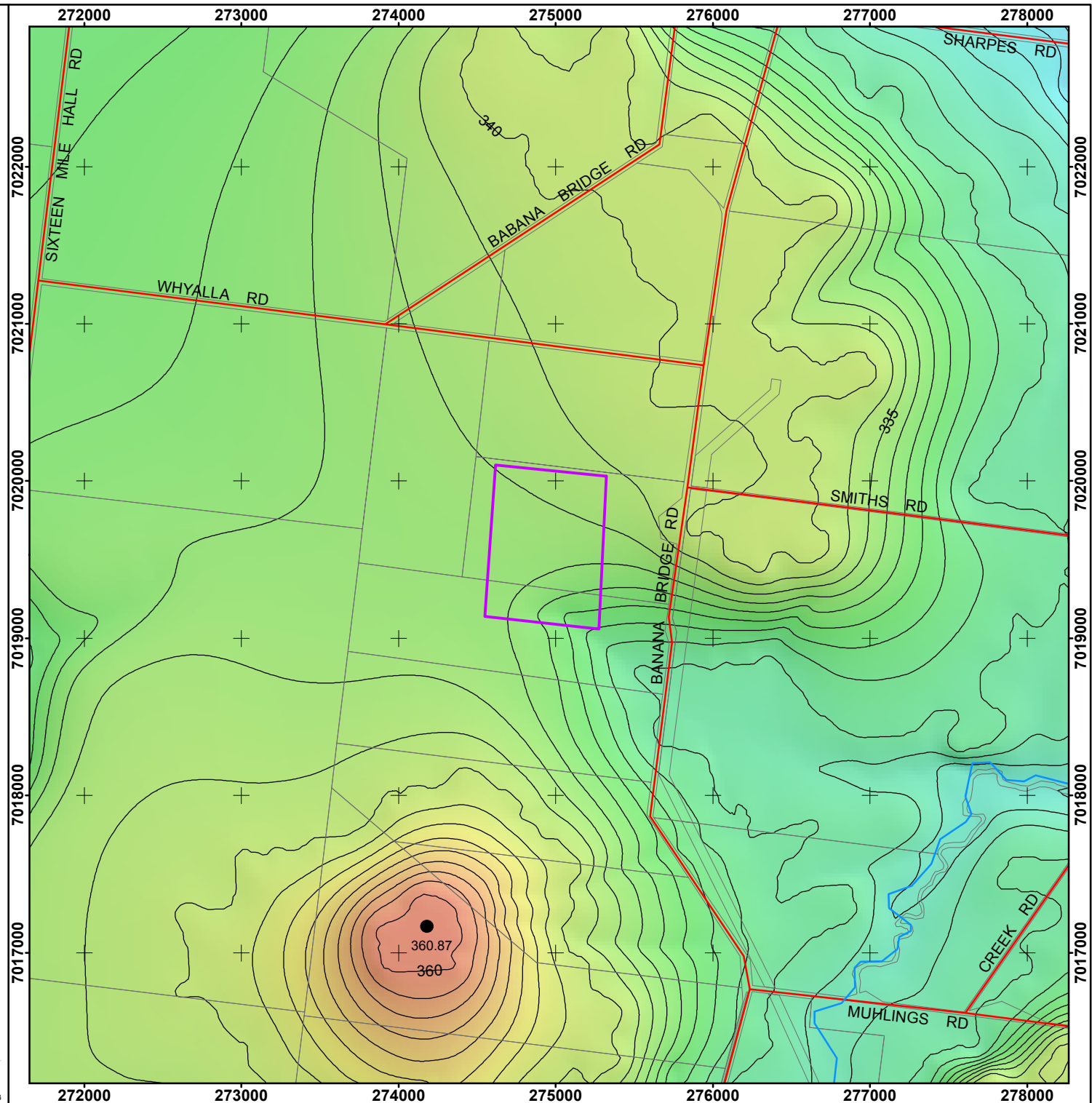
Figure 5.1

- Spot Height
- Contour
- Road
- Watercourse
- Cadastre
- Sub-station

Contours and spot heights
generated from 25m DEM.
Contour interval 2.5m.



Scale 1: 35 000
Datum / Projection: GDA94 MGA Zone 56



5.3 GEOLOGY AND SOILS

5.3.1 Existing Environment

5.3.1.1 Geology

The site is located entirely on Kurbarilla sandstone geology (Digital 1:250,000 Geology Data Base, Geosciences Australia 2005). These sandstones which date from Mesozoic times (most likely Jurassic to Lower Cretaceous), contain mainly clayey labile to quartzose sandstone with some siltstone, mudstone and polymictic conglomerates materials (Maher, 1996). These sandstone formations were significantly eroded in the period following Tertiary times as this site is contained within the ironbark/bull oak Land Resource Area (LRA) (Maher, 1996) this indicates that the rocks were harder than other sandstones in the region and hence have been left as low hills.

5.3.1.2 Soils

The site is completely contained within an ironbark/bull oak forest LRA (Maher, 1996) (Figure 5.2). An LRA contains a number of different soils that vary according to site within the landscape unit. At this time, the different soils that occur within LRAs in this area have not been mapped separately. However, the common soils that could be expected to occur within the ironbark/bull oak LRA include:

- Braemar - moderately thick (20 to 40 cm), bleached sandy surface, over mottle, yellowish brown to greyish brown clay subsoil derived from sandstone; and
- Cutthroat - thick (>30cm) bleached loose sandy surface, over mottled, yellowish brown sand clay subsoil overlying sandstone; and surface, over red brown clay overlying sandstone.

Whilst not identified on the site, Channing soils could also be present. Braemar, Cutthroat and Channing soils however are all treated in a similar fashion from a management perspective.

These soils are all similar in that they are both texture contrast soils and they can be considered to be very similar from an agronomic and soil chemistry perspective (see Table 5.1). The soils tend to be acid, have very low plant available water capacity (PAWC), have low salinity in the surface increasing with depth in the subsoils and are sodic in the surface and sodic to strongly sodic in the subsoils. Bleaching tends to occur in the lower parts of the surface layer, indicating periodic waterlogging.

TABLE 5-1 IMPORTANT AGRONOMIC CHARACTERISTICS OF THE SOILS (SOURCE: MAHER, 1996)

SOIL	PH	SALINITY	SODICITY	EFFECTIVE ROOTING DEPTH (CM)	PAWC IN ROOT ZONE (MM)
Braemar					
Surface soil	5.6	Low	Sodic	30	36
Upper subsoil	6.6	High	Strongly sodic		
Lower subsoil	5.0	Very high	Strongly sodic		
Cutthroat					
Surface soil	5.4	Very low	-	60	8
Upper subsoil	7.8	Low	Sodic		

SOIL	PH	SALINITY	SODICITY	EFFECTIVE ROOTING DEPTH (CM)	PAWC IN ROOT ZONE (MM)
Lower subsoil	8.8	Medium to high	Sodic		
Channing					
Surface soil	5.5	Very low	Sodic	20	24
Upper subsoil	5.1	Very high	Stongly sodic		
Lower subsoil	4.5	Very high	Stongly sodic		

During site investigation a number of shallow soil holes (up to 0.5m) were dug to investigate soil characteristics of the site (see Figure 5.2 for sampling locations). These indicated that the soils on the site are likely to be mainly Channing soils with minor occurrences of Braemar soils occurring along the poorly defined drainage lines. These soils are defined as Sodosols (Isbell et al, 1997). Samples were taken for each soil type and sent to a laboratory to be tested for their sodicity and nutrient status. Table 5.2 summarises these results. This data has been used to inform the EMP in regards to quantities of soil ameliorants that may be required for soil stabilisation (gypsum to counteract sodicity), and revegetation (fertiliser rates).

TABLE 5-2 SUMMARY OF SOILS SAMPLE RESULTS FROM THE PROJECT SITE

SITE	EC (DS/M)	PH	CEC	NA	K	CA	MG	AL	P (MG/KG)	EAT	ESP (%)	TEXTURE
Site 8 Surface 0-10cm	0.05	5.6	6.3	0.6	0.2	1.8	2.4	<0.1	2	3(1)	10.5	Sandy loam
Site 8 Subsoil 10-30cm	0.29	5.9	12.0	2.8	0.1	1.4	6.9		1	2(3)	4.3	Sandy clay loam
Site 10 Surface 0-20cm	0.05	6.8	10.7	0.4	0.3	71	2.1		4	3(1)	26.75	Sandy loam
Site 10 Subsoil 25-40cm	0.19	6.3	13.1	2.9	0.1	1.3	7.4		1	2(3)	4.5	Sandy clay loam

These results suggest that:

- The soils have low salinity in the surface, increasing with depth;
- Have low nutrient status; and
- Are sodic in the surface and strongly sodic in the subsoils.

The Gypsy program was used to calculate the rates of gypsum application that would be required to counteract the sodicity levels for these soils based on the soils results from Table 5.2. Calculations were also made of the rate of fertiliser application to assist in the establishment of vegetation in those areas of the site to be revegetated. The entire 70 ha site should be treated with soil ameliorants before construction begins, the following rates are recommended:

- Gypsum at 15 t/ha; and
- MAP fertiliser at 45 kg/ha.

5.3.1.3 Existing soil erosion

A site investigation found that there was some existing gully erosion adjacent to the project site. The area of erosion is about 200m to the east of the North-East corner of the site (refer to Figure 5.2 for identified erosion areas). The erosion is likely to have formed due to the exposure of sodic subsoils in this area. To ensure the area of erosion does not expand and comprise the project site in the future the erosion should be stabilised as part of the site development. Recommendations have been provided as part of the EMP (see Appendix E).

Management recommendation for erosion sites on sodic soils are provided in Section 5.3.3.1.

5.3.1.4 Salinity

A review of mapping developed as part of the Strategic Salinity Risk Assessment in the Condamine Catchment (Searle et al, 2007) shows that there are no existing salinity locations within the Project site. At a larger landscape scale, there are also virtually no existing salinity locations in all of the Kumbarilla sandstones in the Condamine Catchment. While subsoils are saline (see Table 5.1), this is mainly a function of low permeability of these subsoils and the accumulation of salts within the profile over geological time.

Searle et al (2007) concludes that there is a moderate salinity risk for the subcatchment in which the project site is located; but that this is not relevant to the Kumbarilla landscape on which the site is located.

5.3.1.5 Acid Sulphate Soils

Acid sulphate soils (ASS) are unlikely to be present at the Project site as the site is higher than AHD 100m. There are no characteristics of the site that would indicate that it is subject to ASS.

5.3.1.6 Good Quality Agricultural Land

A review of the GQAL data for the region shows the site is not classified as having agricultural value (see Figure 5.3).

5.3.1.7 Mining and Petroleum

The Queensland Government Department of Mines and Energy's, Interactive Resource and Tenure Maps (IRTM), were accessed (17 September 2009) to determine any registered exploration permits, leases, licenses and permits within or immediately adjacent to the study area, and the results are shown in Figure 5.4a - Figure 5.4d. In summary:

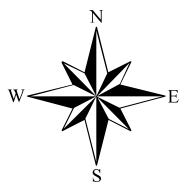
- There is a Petroleum leases held by Linc Energy Ltd directly to the west of the site;
- Aberdare Collieries Pty Ltd hold a Mineral Development License over the eastern part of the site;
- Australian Cbm Pty Ltd currently hold an EPP over the block. The current EPP has expired however a renewal has been lodged.
- Linc Energy Ltd holds a current exploration permit Coal (EPC) for the western part of the site; and
- The site is not on a coal resource area. The closest coal resources to the site are Kogan Creek to the East and Chinchilla to the West.

Powerlink Western Downs EIA Soils Mapping Figure 5.2

-  Watercourse
-  Road
-  Sub-station
-  Cadastre
-  Soil Site

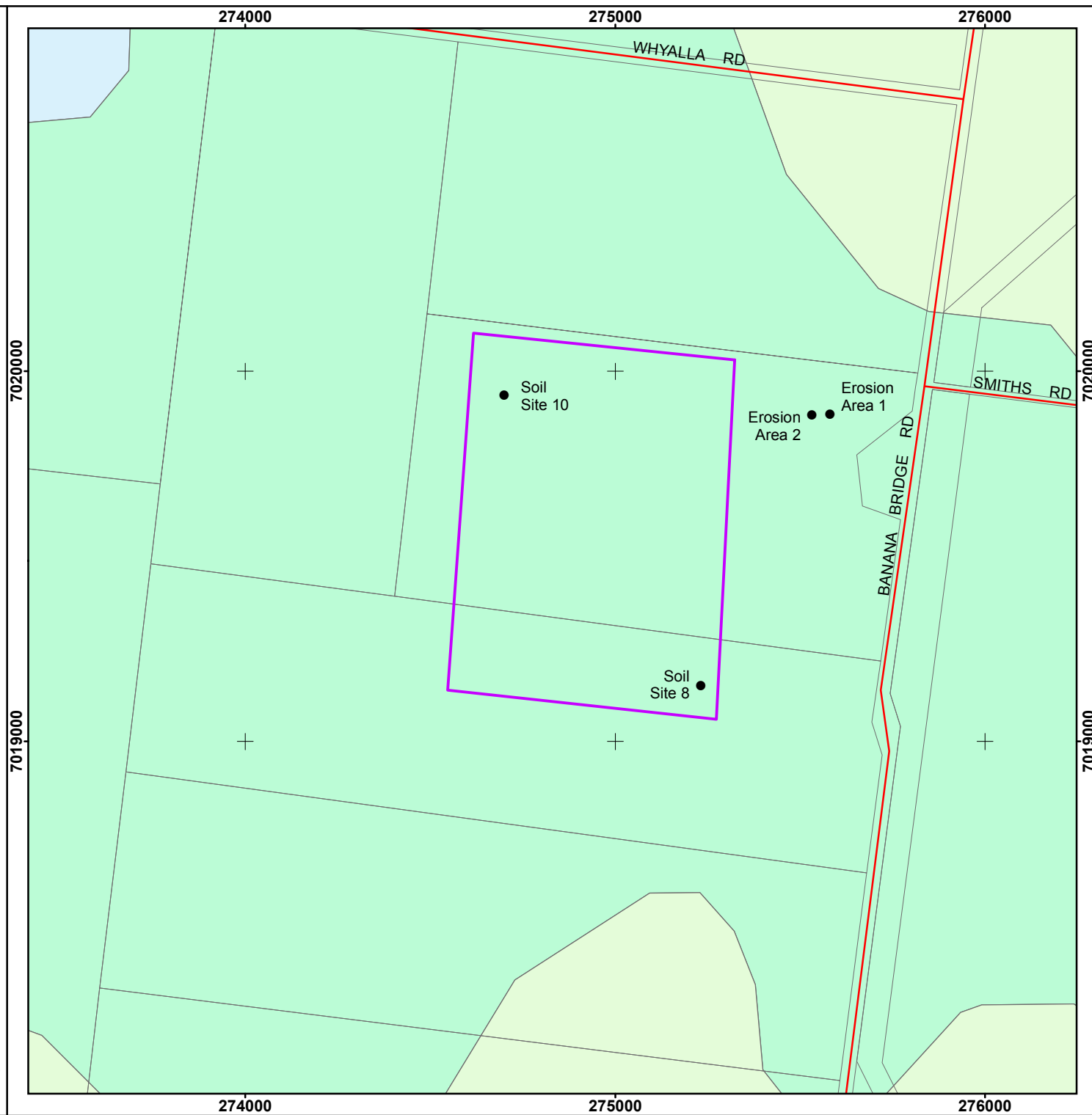
Land Resource Area

-  Brigalow Plains
-  Ironbark/Bull Oak Forests
-  Light Forests



0 50 100 200 300 400 500 600
Meters

Scale 1: 15 000
Datum / Projection: GDA94 MGA Zone 56

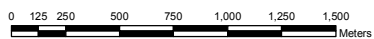
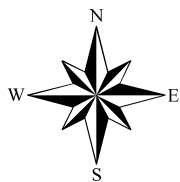


Powerlink Western Downs EIA Agricultural Land Quality Figure 5.3

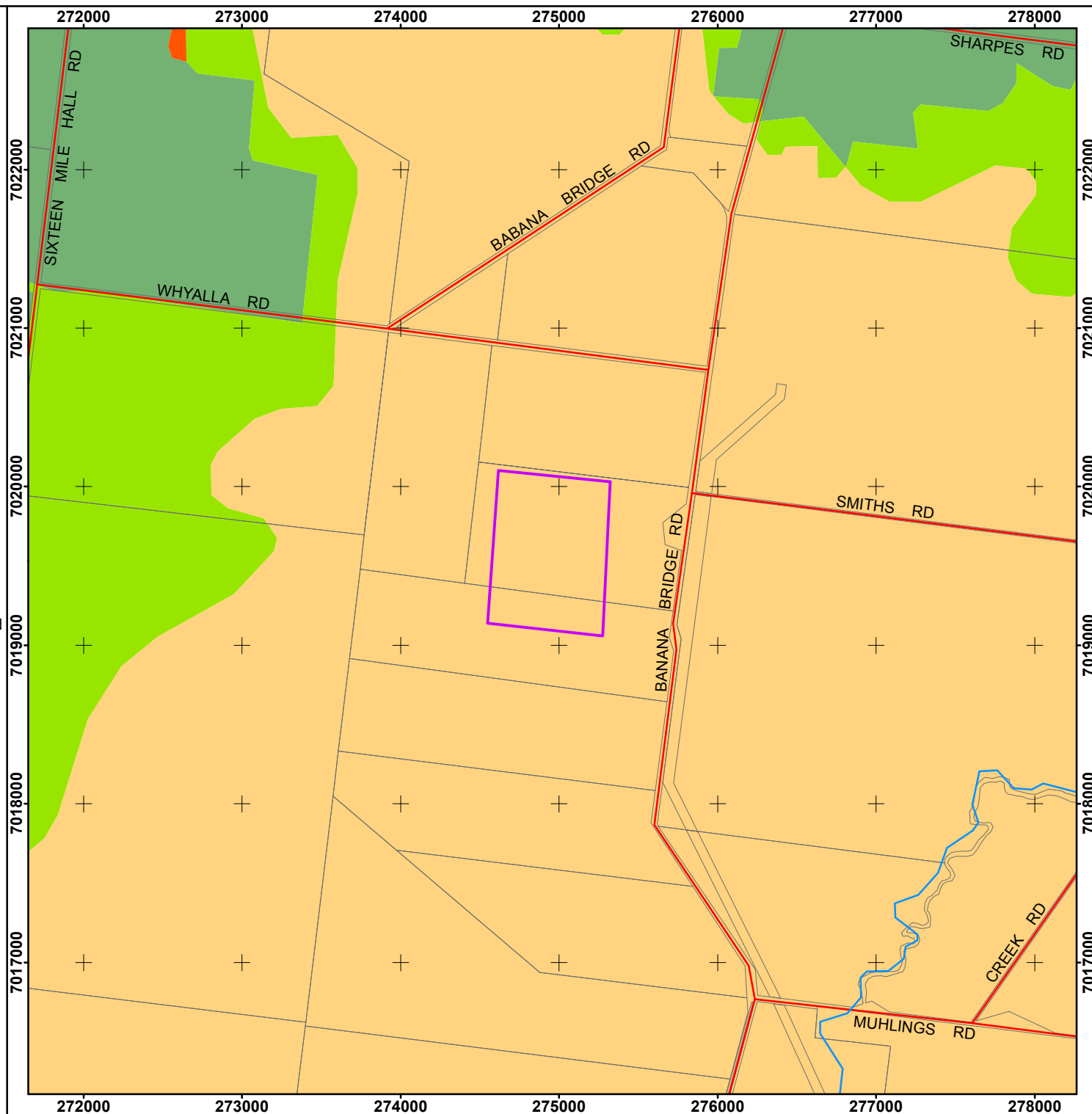


Land Classifications:

A: 'A' land system, Slope < 8% and cropping land use.
 B: 'A' land system, Slope < 8% and grazing land use or 'B' land system, Slope < 8% and crop or grazing land use or 'C' or 'D' land system, Slope < 8% and crop land use.
 C: 'C', 'D' or unspecified land system, Slope < 8% and grazing land use. Grazing land with 'C' land system. Areas of forestry where land system is 'A', 'B' or 'C'.
 D: All other land systems / land use or Slope > 8% where land use is not grazing and land system is 'C'.



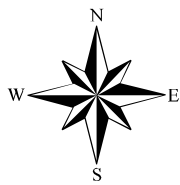
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Powerlink Western Downs EIA

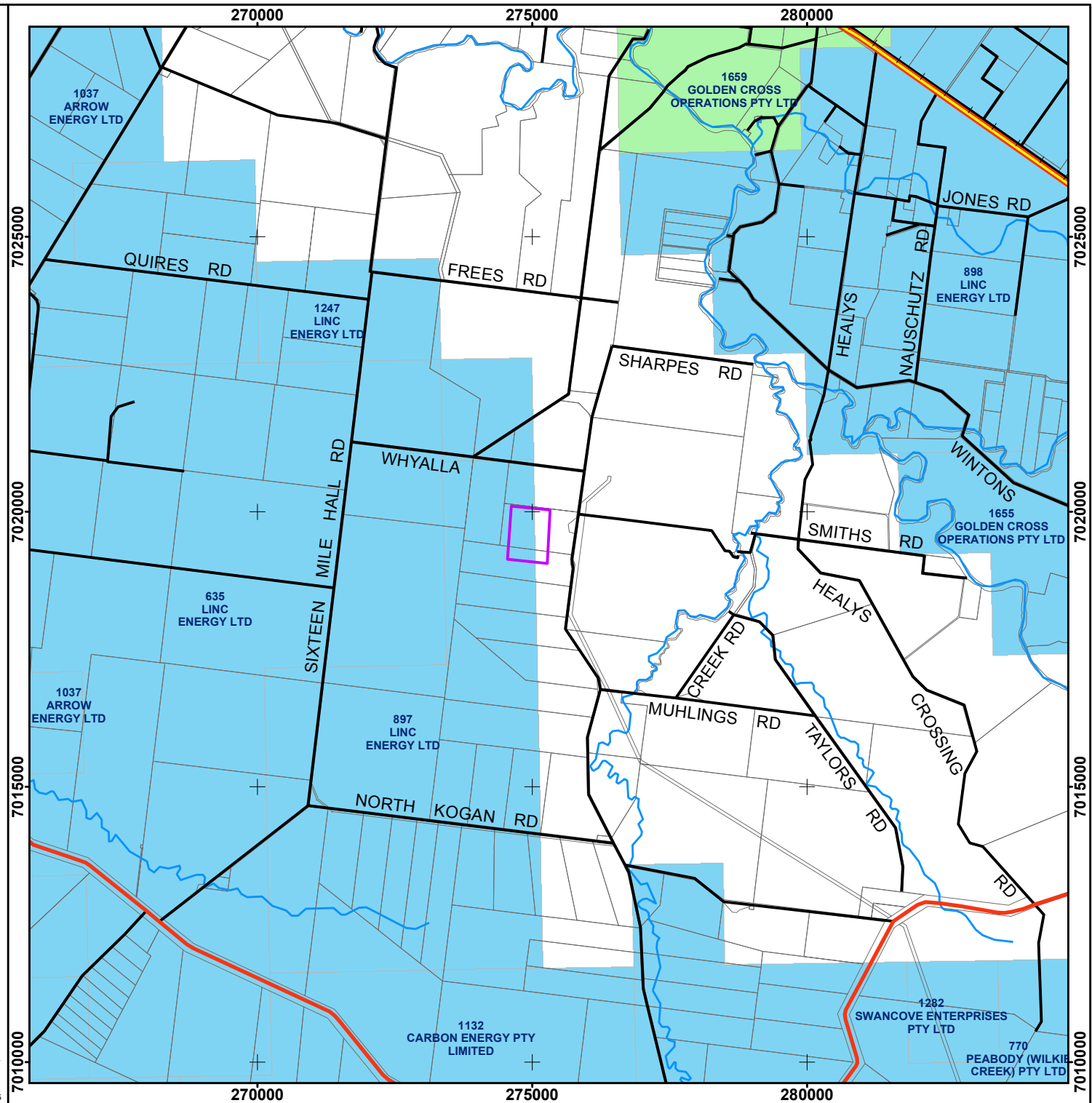
Coal Exploration Permits Figure 5.4a

-  Highway
-  Major Road
-  Local Road
-  Watercourse
-  Sub-station
-  Cadastre
- Exploration Permits (Coal)**
 -  APPLICATION
 -  GRANTED



0 500 1,000 2,000 3,000 4,000
Meters

Scale 1 : 100 000
Datum / Projection: GDA94 MGA Zone 56

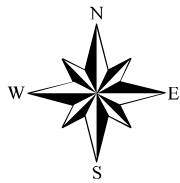


Powerlink Western Downs EIA Petroleum Exploration Permits Figure 5 .4b

-  Highway
-  Major Road
-  Local Road
-  Watercourse
-  Sub-station
-  Cadastre

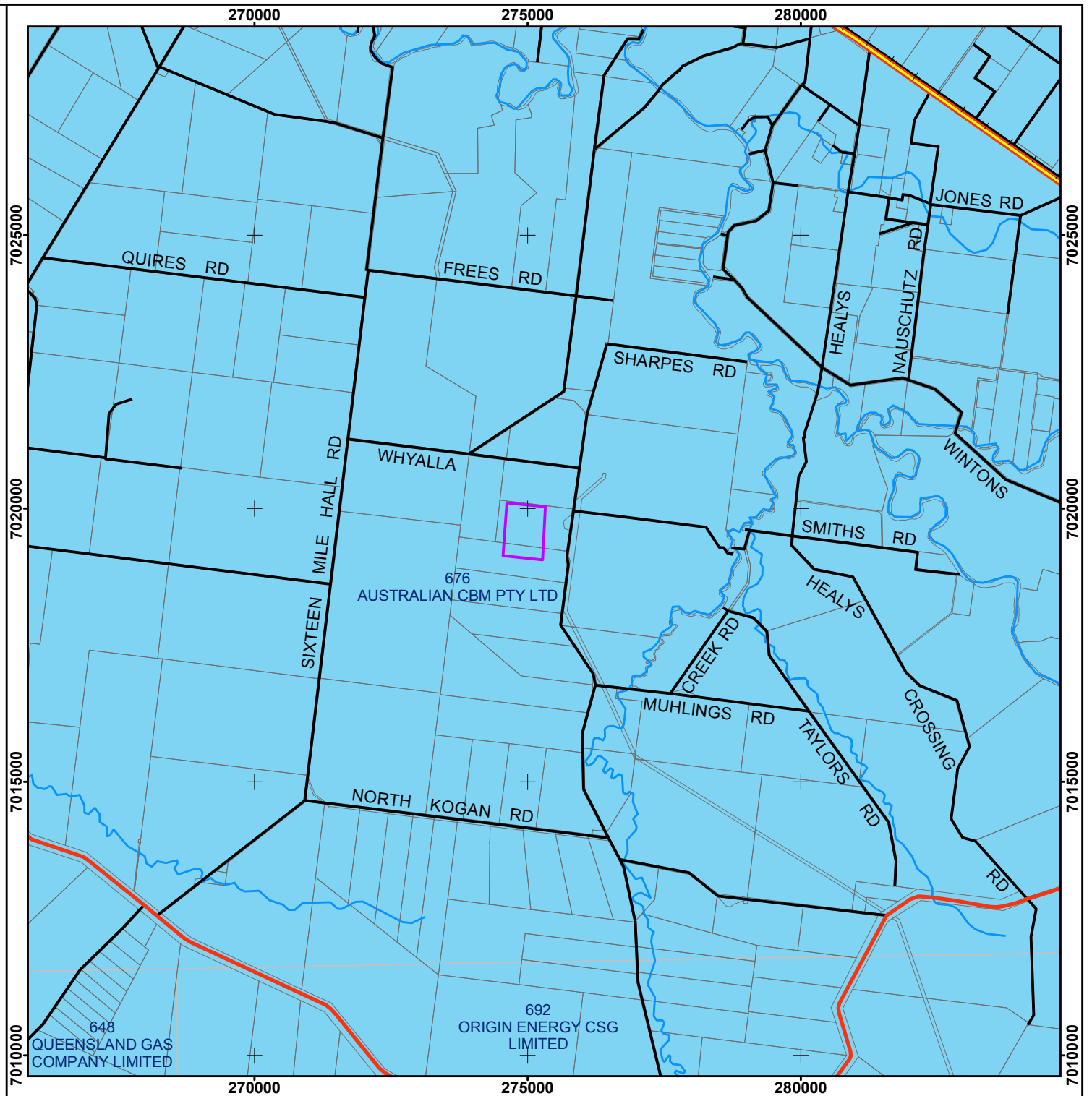
Exploration Permits (Petroleum)

-  APPLICATION
-  GRANTED



0 500 1,000 2,000 3,000 4,000
Meters

Scale 1 : 100 000
Datum / Projection: GDA94 MGA Zone 56

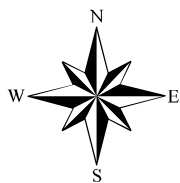


Powerlink Western Downs EIA

Petroleum Lease Applications

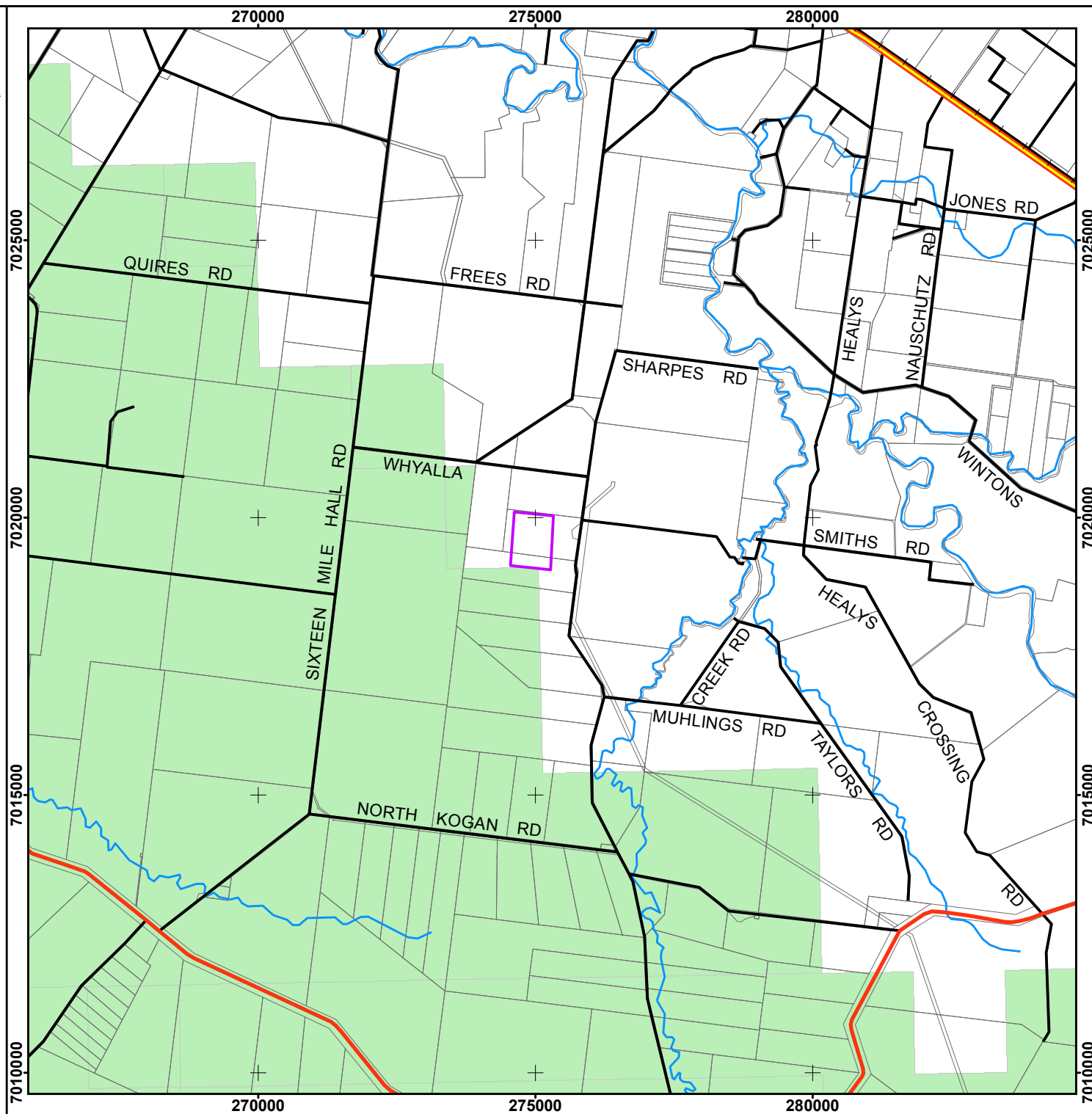
Figure 5.4c

-  Highway
-  Major Road
-  Local Road
-  Watercourse
-  Sub-station
-  Cadastre
- Petroleum Lease Application**
 -  APPLICATION
 -  GRANTED



0 500 1,000 2,000 3,000 4,000
Meters

Scale 1 : 100 000
Datum / Projection: GDA94 MGA Zone 56



Powerlink Western Downs EIA

Mining Tenements

Figure 5.4d

-  Highway
-  Major Road
-  Local Road
-  Watercourse

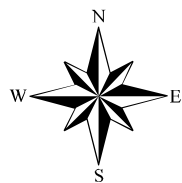
 Sub-station

 Cadastre

Mining Leases

 APPLICATION

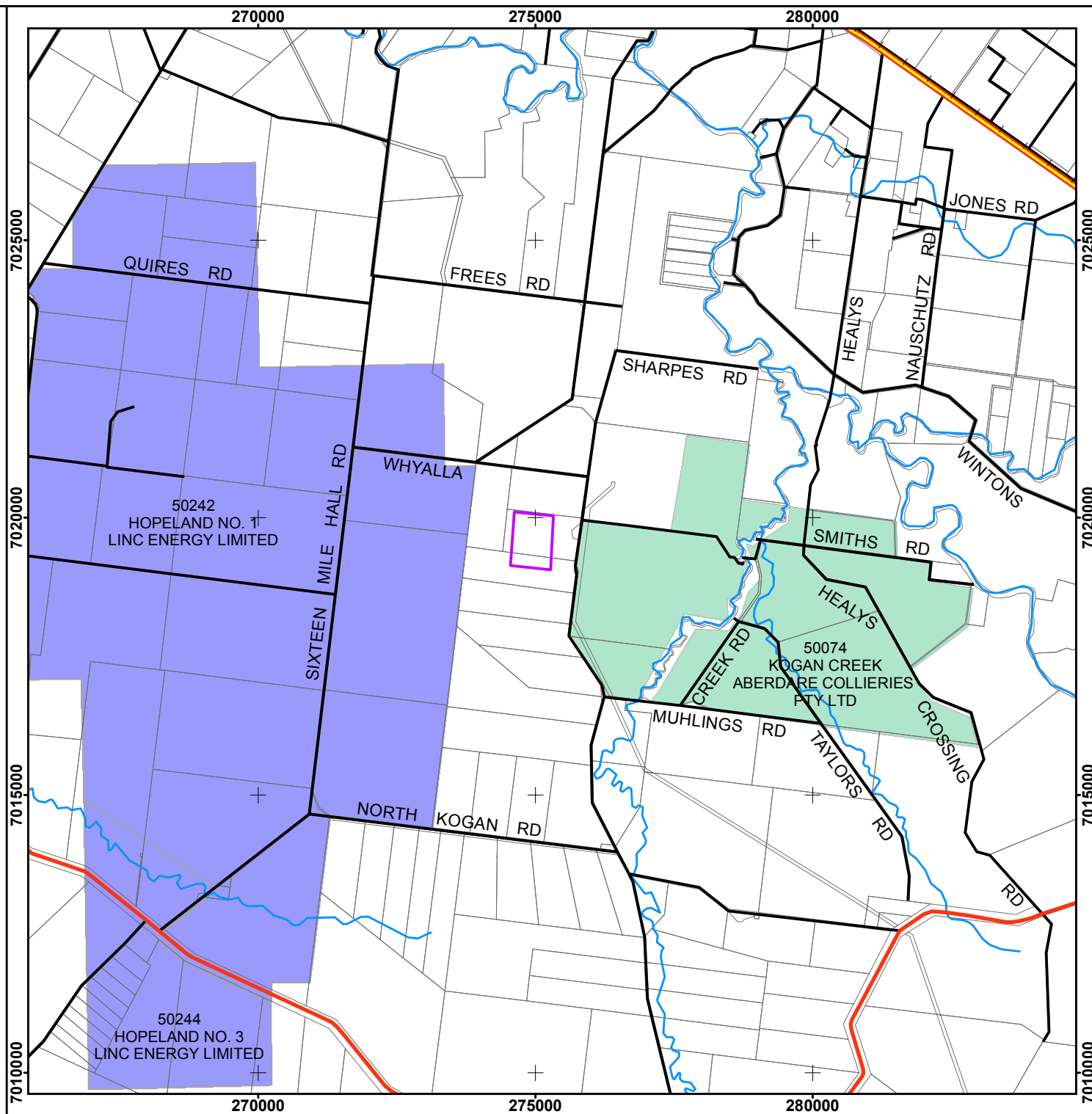
 GRANTED



0 500 1,000 2,000 3,000 4,000
Meters

Scale 1 : 100 000

Datum / Projection: GDA94 MGA Zone 56

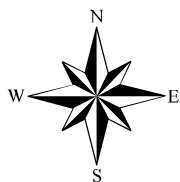


Powerlink Western Downs EIA

Mineral Development Licences

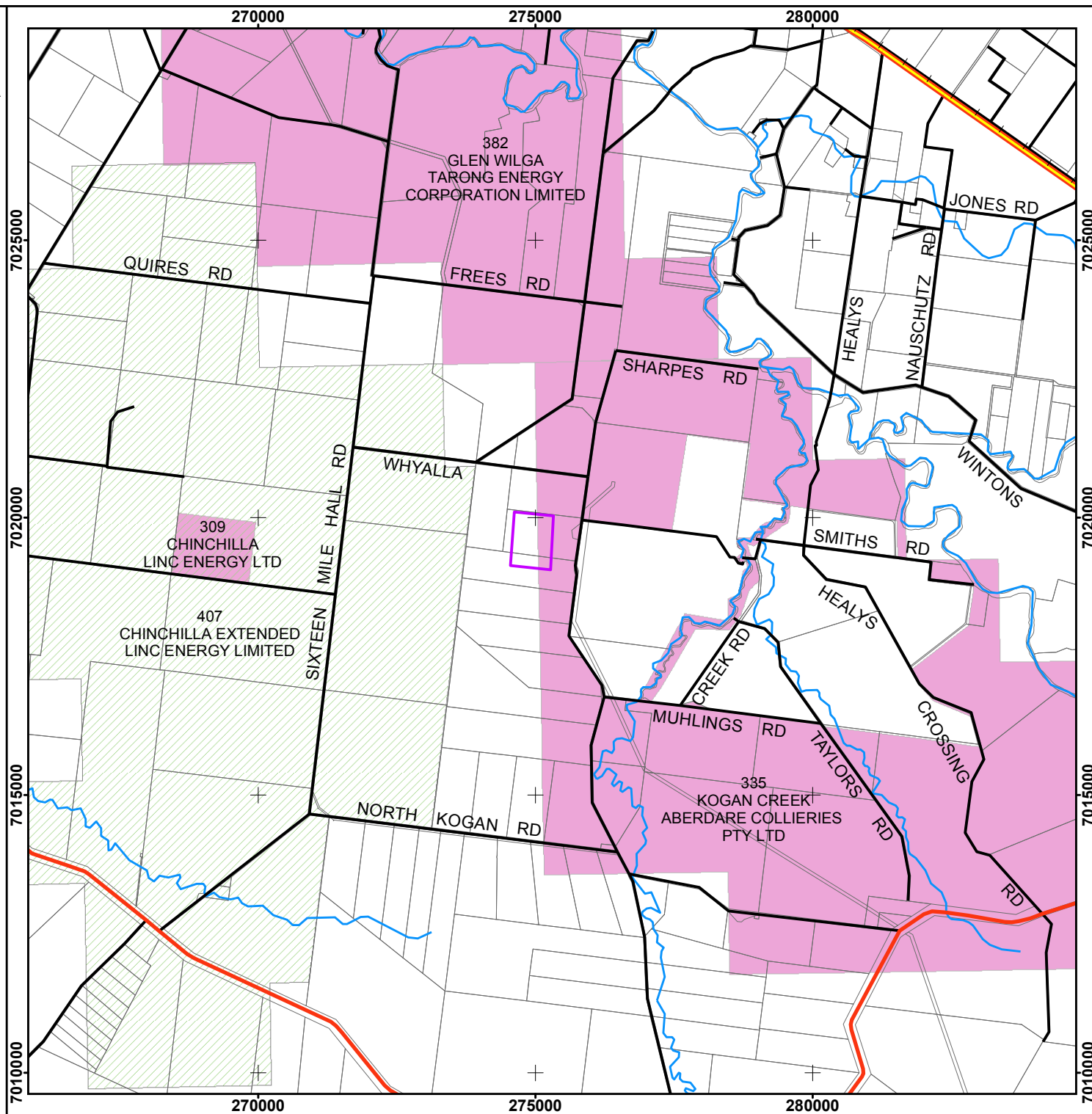
Figure 5.4e

-  Highway
-  Major Road
-  Local Road
-  Watercourse
-  Sub-station
-  Cadastre
- Mineral Development Licenses**
 -  GRANTED
 -  APPLICATION



0 500 1,000 2,000 3,000 4,000
Meters

Scale 1 : 100 000
Datum / Projection: GDA94 MGA Zone 56



5.3.2 Potential Impacts

5.3.2.1 Soil Erosion

Due to the site having low slopes and a sandy loam soil surface, the project site is not considered to have a high risk of water erosion while the soil surface is intact. However, texture contrast soils with sodic subsoils are prone to tunnel erosion, and the problem occurs when the subsoils are exposed. Tunnels generally form under the surface and eventually cave in to form gullies. The rehabilitation of tunnel eroded areas can be difficult and expensive to repair (Maher, 1996).

Potential for erosion of susceptible saline/sodic subsoils is a key concern during the construction phase. This will only be of concern where subsoils are exposed when these soils are excavated as a result of construction works.

There is potential for erosion on the site if water flows are concentrated therefore impedance of flows across the site should be minimised and sheet flow conditions, as would naturally occur, should be maintained as much as possible. The minor floods that can be expected to traverse the site will need to be directed around critical equipment, therefore requiring some local drainage channels and drains to divert this water (see Section 7.2.1).

5.3.3 Mitigation Measures

5.3.3.1 Soil Erosion

There are two primary issues that need to be dealt with in regards to soil erosion due to sodic soils on the project site. Firstly, there is a need to reduce the risk that erosion of the subsoils occurs due to construction activities. This will be achieved by ensuring that earthworks are conducted in a manner which limits the exposure of sodic subsoils to water flow where practicable. Secondly, there is a need to repair the erosion that already exists on the site. This may be achieved through the use of deep ripping, application of gypsum, and where required the filling of gullies using soil that is non-sodic.

In order to minimise flow concentration, levelling of the site should be conducted in a fashion as to maintain sheet flow of water across the site. Possible impediments to flows such as roads should either be constructed flat with ground level or constructed of coarse gravel to allow water to flow through.

Where bunding and drainage channels are required to direct water away from areas with critical equipment, or where chemical or hydrocarbon storage is required, the bank will be pushed up from the back so not as to expose the sodic subsoils to water flows. The material used to construct the bund and drainage channels should be treated with gypsum, fertilised and seeded with grass to stabilise them as soon as possible after construction.

Where concentration of water flows does occur due to the construction of drainage channels, the discharge points should be on a soil not susceptible to tunnel erosion and be well grassed.

Best practice on managing these soils will be employed and all earthworks to level pads for substation platforms will ensure:

- Subsoils are not exposed to water flows;
- High levels of surface cover are maintained to reduce erosion potential;
- Water flows are kept distributed and not channelized to reduce erosion potential; and
- Any banks that are required to be constructed are formed from the lower side as not to expose the subsoil in the bank channel.

Where tunnelling and gully erosion exist (or in the event are created due to earthworks on site) the following practices will be used to stabilise the site:

- Divert water from the top of the eroded area; it is vital to find a safe disposal area, otherwise the problem is being shifted from one place to another. The disposal site must be well grassed and on a soil not susceptible to tunnel erosion;
- If the tunnels are close to the surface and shallow (less than 60 cm to the bottom of the tunnel) intensive cross ripping may succeed. The first ripping should be up and down the slope and subsequent ripping at right angles to the first;
- If the tunnels are deeper than 60 cm, the tunnels can be filled with soil. This should be done when the soil moisture conditions are fairly high and it is vital the area is well compacted. The soil used as fill should be sourced from an area not susceptible to tunnel erosion;
- The effected area should be treated with gypsum, fertilised and sown to grasses suitable for the area; and
- Ongoing regular monitoring is vital.

In addition to the above recommendations, the Best Practice Erosion and Sediment Control - for Building and Construction Sites (IECA 2008) outlines best practice sediment and erosion control measures in Queensland. These measures must be implemented in all disturbance areas as identified in the EMP (see Appendix E).

5.4 LAND CONTAMINATION

An EMR/CLR search was conducted for the Project site (Lot 3 and Lot 4 on RP176346). The search results indicated that the land is not currently listed on the EMR.

A visual site inspection of the project site was conducted on 10 September 2009. The observation made during the inspection was that there appeared to have been no contaminating activities conducted on the land parcel at the time of inspection.

Results of a search of the Department of Defence (DoD) Unexploded Ordnance (UXO) website indicate that the land is located in an area unaffected by UXO.

6.0 CLIMATE AND AIR QUALITY

This section provides a description of the climatic features and microclimate of the study area, including typical temperature, wind, rainfall data, and atypical meteorological conditions and their likely frequency of occurrence. Generic details of the existing air quality and the presence of pollutants are also provided.

The likelihood of air quality impacts (including potential dust and odour nuisance) on residences and ecologically sensitive areas during the construction and operation phases are discussed within this section. Commentary is also provided on the potential impacts of climate change on the proposed development. Finally, mitigation measures are provided to reduce the identified potential impacts.

6.1 EXISTING ENVIRONMENT

This section describes climate and air quality within the Kogan/Warra region, with specific mention of the impact of climate change on the proposed development.

An assessment has been conducted into the climatic conditions of the region, and the quality of air recorded adjacent to the Project site. The following resources were used in the preparation of this section:

- Weather data provided by the Bureau of Meteorology (BoM) and Emergency Management Australia (EMA);
- Air quality data provided by CS Energy; and
- Review of the Department of Environment and Resource Management's (DERM) Air Quality Bulletin South-East Queensland.

6.1.1 Climate

Meteorological data collected from the Dalby Airport weather station (site no. 041522; approximately 50km south-east of the Project site) between January 1992 and September 2009, indicates that the Kogan region is considered a 'Hot Dry Climate', under the BoM climate zone classification (BoM, 2009).

6.1.1.1 Rainfall & Temperature

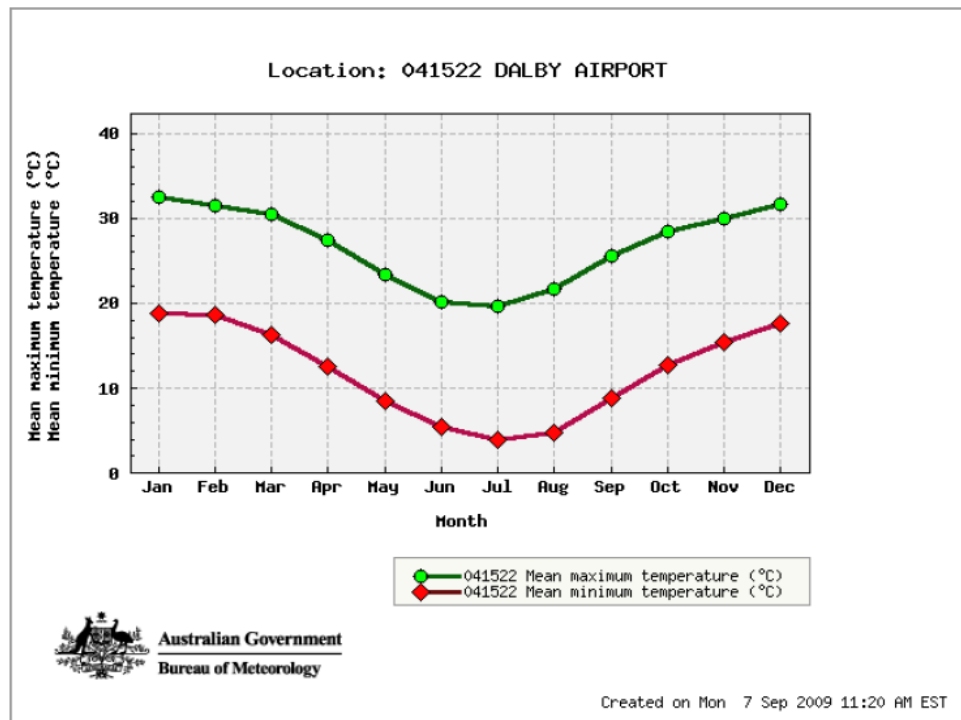
Rainfall in Southern Queensland is considered highly variable and subject to extended periods of drought, followed by intensive rainfall. Maximum temperatures often reach 30°C in the Summer months, and minimum temperatures often fall below 5 °C over Winter. Table 6.1 shows the climatic averages calculated from available BoM data for records commencing in 1992 until 2009 (BoM, 2009).

TABLE 6-1 AVERAGE CLIMATIC DATA RECORDS FOR DALBY AIRPORT

CLIMATE OBSERVATION	DALBY AIRPORT CLIMATE RECORDS
Annual Mean Daily Minimum Temperature (°C)	12.0
Annual Mean Daily Maximum Temperature (°C)	26.8
Annual Mean Rainfall (mm)	608.3
Annual Mean Number of Rain Days (days)	55

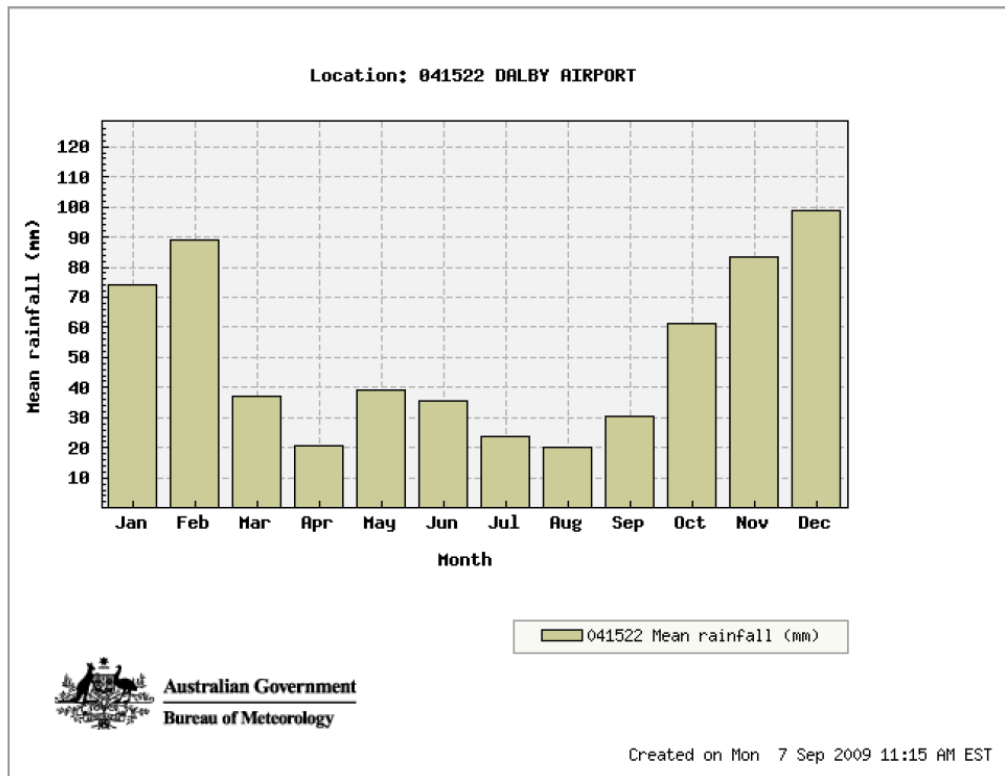
The climatic variation between months and between seasons within a period of a year is also important to note. The graphs below outline the monthly average rainfall and temperature for the wider area (as recorded at Dalby Airport).

GRAPH 6-1 MONTHLY MEAN MINIMUM & MAXIMUM TEMPERATURES (°C) FOR THE GREATER DALBY REGION



GRAPH 6-2

MONTHLY MEAN RAINFALL (MM) FOR THE GREATER DALBY REGION



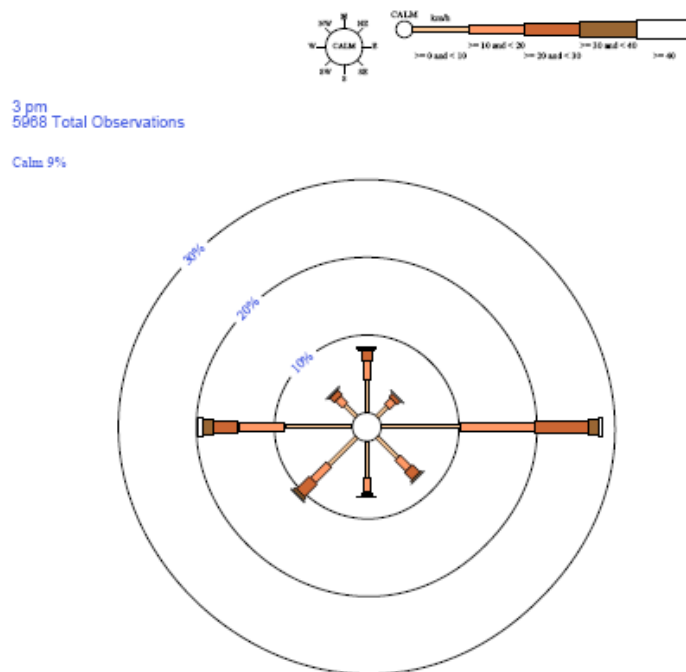
6.1.1.2 Wind

Wind motion characteristics are highly variable both in speed and direction. Wind patterns are generally defined by atmospheric distribution. However, locally, wind is influenced by the time of day, height above ground level and surrounding terrain (BoM 2009). Wind is often studied by frequency analysis rather than averages and is represented by wind roses to provide a rapid appraisal of the frequency of wind speed and direction.

Annual wind data collected by the Dalby Airport weather station indicated that the Project site is typically subjected to prevailing easterly winds for most of the year, with the average wind speed of approximately 12km per hour (BoM, 2009). Details of wind direction and velocity are shown in Figure 6.1 and 6.2. The data consists of 5980 (9am) and 5968 (3pm) observations from 1992 to 2008. The following should be noted when interpreting this data:

- The percentage of calm conditions is represented by the size of the circle in the centre of the wind rose;
- Each branch of the rose represents the direction from which the wind is coming (north at top of diagram);
- The thickness and colour of the branches represent the wind speed ranges in 10km/hr increments. A thicker segment represents a faster wind speed; and
- The length of each branch segment represents the percentage of wind in that wind speed range, blowing from that particular direction.

FIGURE 6.2 MEAN ANNUAL 3PM WIND SPEED VS DIRECTION FOR DALBY AIRPORT (1992-2008)



6.1.1.3 Extreme Weather Events

A review of atypical weather events was completed using databases from the Bureau of Meteorology (BOM) and Emergency Management Australia (EMA) and is summarised in Table 6.2. The later is accepted to include all Australian natural disasters from the late 1900's to present.

TABLE 6-2 SUMMARY OF PREVIOUS EXTREME WEATHER EVENTS FOR STUDY AREA

DATE	EVENT	DETAILS
01/02/1981	Flood	Dalby: Flooding and stormy conditions in the wake of an ex-tropical cyclonic depression resulted in heavy damage to approximately 2000 homes that were flooded. Crop damage and considerable erosion also resulted.
01/01/1983	Severe storm	Chinchilla: Severe Storm (incl Tornado), approx \$3.5million in damages / insurance claims.
24/11/1998	Severe storm	Dalby: Winds up to 90km/h and more than 3,300 lightning strikes were recorded in 2 hours. Roofs were ripped off houses and power cut to most of the population.
18/12/1998	Severe storm	Minor damage to trees & houses was reported at Dalby, Laidley, Esk & Toogoolawah.
26/01/2007	Severe storm	Dalby: Winds estimated at 100km/h and hail averaging 3cm in diameter.
7-12/10/2007	Severe storm	Chinchilla: Severe storms that occurred over a six day period. Storm damage sustained included roof damage, fallen trees and water damage etc.
16-22/11/2008	Severe storms & flooding	Dalby Regional and Central Highlands Regional Council granted Natural Disaster Relief and Recovery Arrangements (NDRRA) funding. Dalby.

The data shows that severe storms (including high winds, hail and inundation with flash flooding) are the most common atypical events for the area, with an average of 10 to 25 thunder days (Figure 6.4 and 2 to 3 ground lightning strikes per square km per year (Figure 6.4)

FIGURE 6.3 AUSTRALIAN AVERAGE ANNUAL THUNDER DAYS (BOM, 2005)

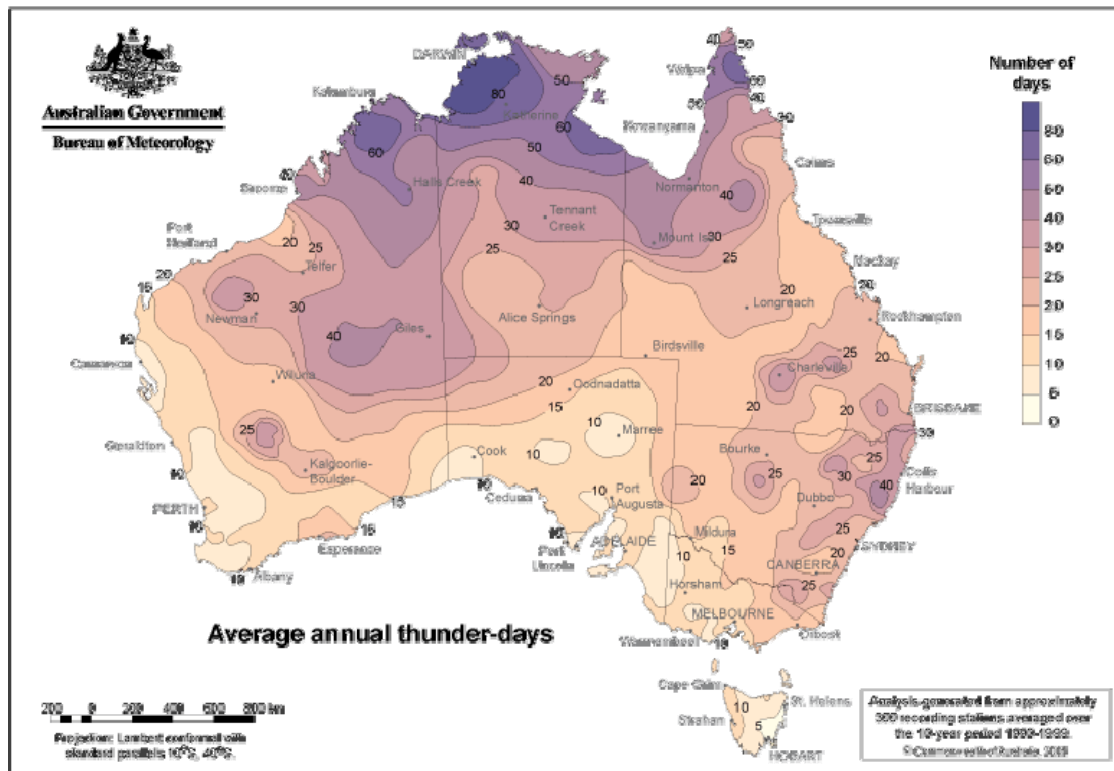


FIGURE 6.4 AUSTRALIAN AVERAGE ANNUAL LIGHTNING GROUND FLASH DENSITY (BOM, 2005)

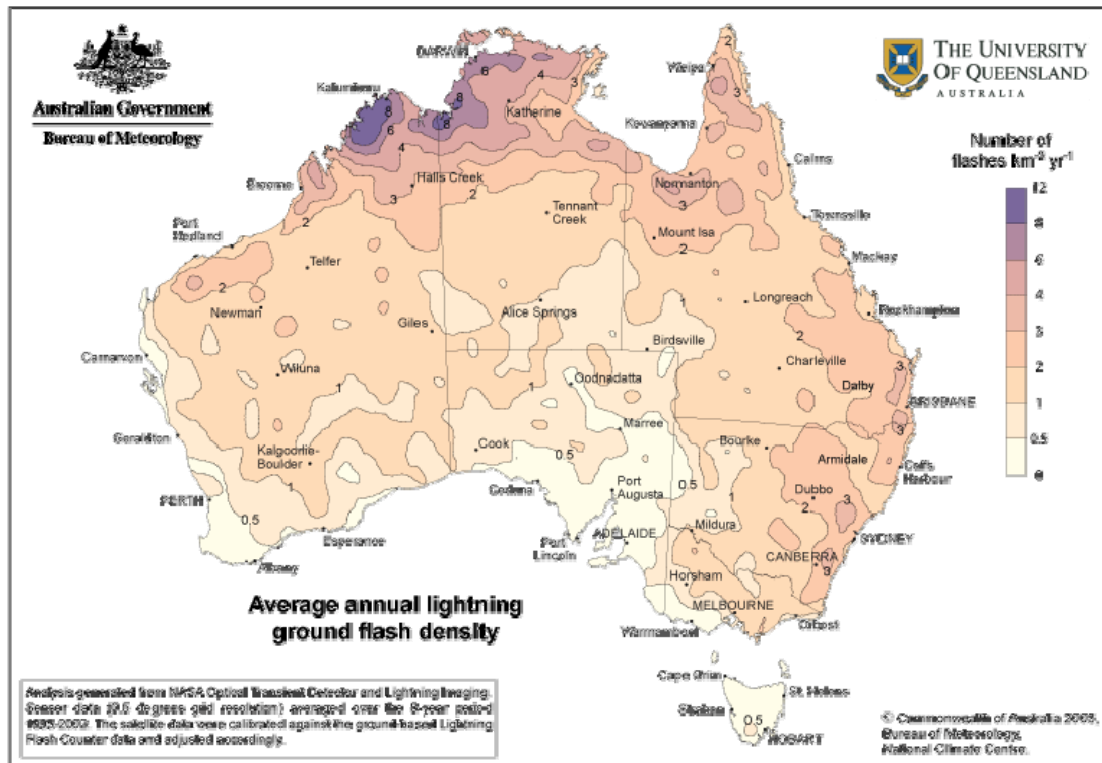
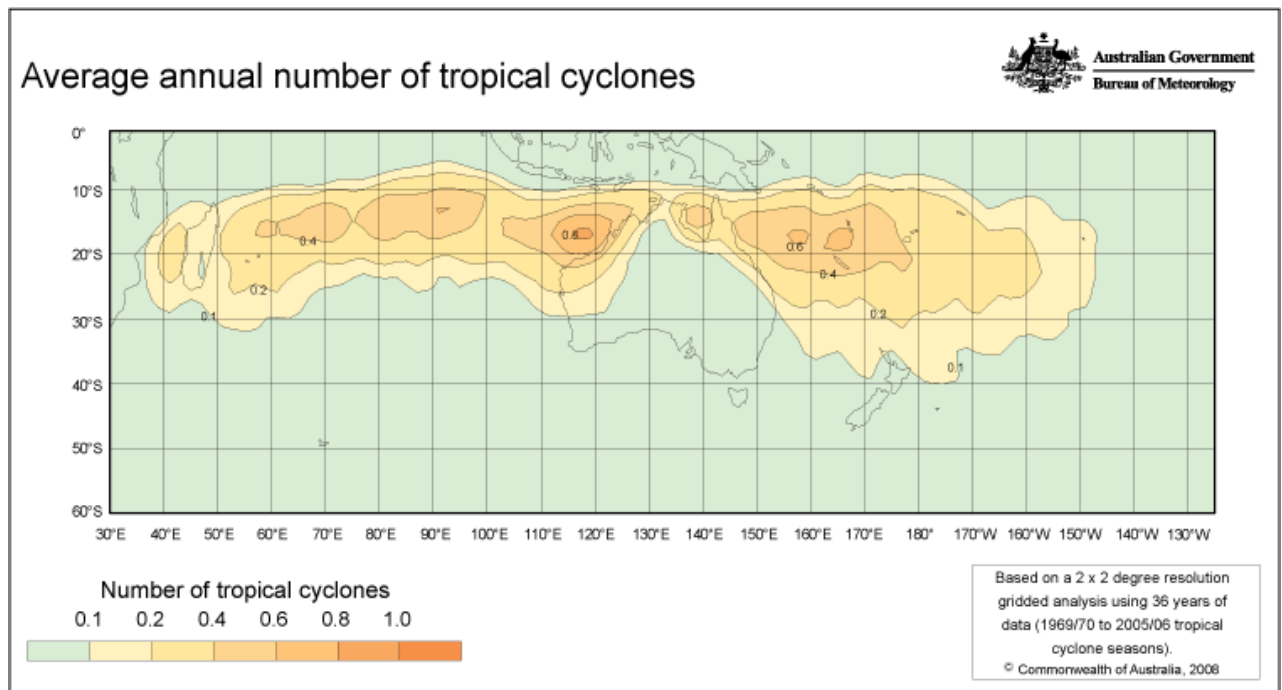


FIGURE 6.5 AUSTRALIAN AVERAGE ANNUAL TROPICAL CYCLONE INCIDENTS (BOM, 2006)



6.1.2 Air Quality

CS Energy's Kogan Creek Whyte air quality monitoring station is located immediately west of the proposed Project site. The monthly summaries of the ambient air quality data from June 2008 to 2009 is provided below.

TABLE 6-3 CS ENERGY AIR QUALITY DATA

MONTH/ YEAR	NO PPB	NO2 PPB	NOX PPB	SO2 PPB	O3 PPB	PM25 $\mu\text{G}/\text{M}^3$	PM10 $\mu\text{G}/\text{M}^3$
Jun 2008	0	1	2	1	19	3	11
Jul 2008	0	1	1	0	20	2	9
Aug 2008	0	1	1	0	24	3	13
Sept 2008	0	1	1	0	24	7	22
Oct 2008	0	1	1	0	22	6	16
Nov 2008	0	2	2	0	22	6	17
Dec 2008	0	1	1	1	24	7	15
Jan 2009	-2	1	-2	1	19	5	15
Feb 2009	0	1	1	1	22	6	16
Mar 2009	0	1	1	1	18	4	21
Apr 2009	1	0	1	0	14	2	13
May 2009	0.1	0.6	0.7	0.5	19.9	5	14
Jun 2009	0.3	0.4	0.8	0.2	17.6	2	8
Annual	0.0	0.9	0.9	0.4	20.4	4.5	14.6

The daily average data collected from the Kogan Creek Whyte monitoring station shows no exceedances in ambient guidelines with the exception of Particulate Matter 2.5 micron (PM2.5), and Particulate Matter 10 micron (PM10) values as follows:

- 25 November 2008 – PM2.5 value of 25 equals Environment Protection Policy Air (EPP) Air Quality Objective of 25; PM10 value of 49 is just below EPP Objective of 50;
- 16 September 2008 – PM2.5 of 29 above objective of 25; PM10 value of 123 well above objective of 50; and
- 17 September 2008 – PM2.5 of 16 below objective of 25, but PM10 of 53 above objective of 50.

The Objective for PM10 allow for an exceedance on 5 days per annum for environmental values to still be protected. The 2008-2009 data provided is consistent with this objective.

High values may be a result of a combination of number of factors including regional dust storms, local ploughing of fields, unsealed roads, and the nearby Kogan Creek Power Station.

In addition to this, the Department of Environment and Resource Management (DERM) monitors air quality in south-east Queensland, with the closest monitoring station to the Project site being located at Toowoomba (approximately 140km to the south-east). The most recent (April 2009) Air Quality Bulletin South-east

Queensland reported that pollutant levels within the Toowoomba area are generally consistent with pollution levels across the South-east Queensland and reflects air quality of a metropolitan area (DERM, 2009). The bulletin also reported that pollutant levels did not exceed the relevant standards contained in the Commonwealth National Environment Protection (Ambient Air Quality) Measure (Air NEPM), the monitoring investigation levels contained in the Commonwealth National Environment Protection (Air Toxics) Measure or EPP (Air) visibility goal.

6.2 POTENTIAL IMPACTS

This section outlines a number of impacts relevant to the Project, including the impact of climate change on the proposed development, and the impact the proposed development may have on the ambient air quality.

6.2.1 Climate

The Australian Greenhouse Office (now Department of Climate Change) document "Climate Change: An Australian Guide to the Science and Potential Impacts" summarises the risks of climate change to include changes in rainfall pattern and intensities and bushfire patterns, increase in the average global surface temperature and sea level rise. For infrastructure, modelling suggests climate change impacts will be noticeable by 2030, with significant risks to property and plant by 2070 unless appropriate adaptation measures are undertaken.

The report also documents a need for infrastructure and the built environment to adapt to a medium to high certainty of changes to magnitude and frequency of extreme weather events. In these circumstances the risk of weather and climatic conditions exceeding design criteria (resulting in damage and increased 'wear and tear' on the structure) are considered significant.

As the useful design lifespan of the project infrastructure is expected to be 50 years, the structure will need to plan for changes in environmental conditions.

Quantitative assessment of the magnitude and scope of the changes to our climate have been undertaken previously by the CSIRO and the BoM. The *Climate Change in Australia — Technical Report 2007* and associated website provides climate change projections for Australia based on the Intergovernmental Panel on Climate Change (IPCC) modelling, which is based on various assumptions the regarding demographic, economic and technological variables influencing future emissions profiles.

In 2009 more specific information for the Eastern Downs Region was updated and presented as part of the ClimateQ report (QLD Office of Climate Change, 2009).

Generally this data indicates 2070 peak summer temperature to be in the range of 2 to 5 degrees Celsius above current values (relative to 1980-1999), with a 2 to 5% reduction in summer rainfall. Some additional climatic factors from the document are described in the below table. All values are 50th percentile, or median values from the various modelled scenarios under a high, fossil fuel intensive emissions profile.

TABLE 6-4 PROJECTED CLIMATE CHANGE IN PROJECT AREA (CSIRO ET AL, 2007) (OCC, 2009)

	CURRENT	2030 PROJECTION	2050 PROJECTION	2070 PROJECTION
Summer Temp	18.6 - 31.8°C	+1°C (+0.6 – 1.4°C)	+1.9°C (+1.2 – 2.8°C)	+3.1°C (+2.0 – 4.6°C)
Annual Temp	12 – 26.8°C (max 41.7°C)	+1°C (+0.7 – 1.4°C)	+2°C (+1.3 – 2.8°C)	+3.2°C (+2.1 – 4.5°C)
Summer Rainfall	262 mm (42.5% of total)	-1% (-10 – +10%)	-1% (-19 – +19%)	-2% (-29 – +30%)
Annual Rainfall	694mm	-3% (-11 – +5%)	-6% (-21 – +10%)	-9% (-32 – +16%)
Annual Relative Humidity	50 – 60%	-0.5 – +0.5%	-0.5 – +0.5%	-0.5 – 1%
Annual Solar Radiation	15 – 19 MJ/m ³	-1 – +1%	-1 – +1%	-1 – +1%
Wind speed	11.1 – 12.8 km/h	-2-+2%	+2-5%	+5-10%
Evaporation	6.2 mm / day	+3% (+2 – 5%)	+7% (+4 - 10%)	+11% (+7 - 15%)

6.2.2 Regulatory Environment

International Policy

The Intergovernmental Panel on Climate Change (IPCC) is the international body responsible for review and assessment of the scientific research into climate change since 1990. The most recent (2007) review (the IPCC Fourth Assessment Report) concluded that:

- Warming of the climate system is unequivocal;
- Most of the warming in the past 50 years is 'very likely' (more than 90% in probability) due to the observed increase in greenhouse gas concentrations from human activities such as the burning of fossil fuels and land use change; and
- It is 'very likely' that changes in the global climate system will continue well into the future, and that they will be larger than those seen in the recent past.

International cooperation on Greenhouse Gas (GHG) emissions is managed under an international treaty called the United Nations Framework Convention on Climate Change (UNFCCC). It is under this treaty that the first targets for reduction of GHG emissions was established in 1997, the Kyoto Protocol.

Under the Kyoto protocol an average global emission reduction of 5.2% from 1990 levels is targeted for the five year period ending 2012 (first commitment period is 2008 – 2012). Australia's target under the scheme is to impede emissions growth to 108% of 1990 levels (Department of Climate Change, 2008). The post 2012 targets will be decided in December 2009 in Copenhagen.

National Policy

Domestically the Commonwealth Government have committed to emission cuts of 60% by 2050. Proposed for implementation in mid 2011, the Carbon Pollution Reduction Scheme (CPRS) is a market based cap and trade system with the target to reduce emission by between 5 and 15% by 2020 (relative to 2000 levels), depending on the outcome and scope of the post-Kyoto international agreement (DCC, 2008). The impact of the proposed CPRS on the project is likely to be primarily in the increased costs of goods and services associated with the 'flow on' effect of carbon charges in the supply chain. Use of less carbon-intensive products will reduce this impact.

The National Greenhouse and Energy Reporting Scheme (NGERS) will underpin the CPRS, providing the emissions data on which obligations under the CPRS will be based. In order to satisfy any NGERS obligations (which may be either project specific or contribute to corporate level reporting), appropriate fuel and energy information needs to be collected by each sub-contractor involved with the projects construction.

The Mandatory Renewable Energy Target (MRET) requires electricity retailers and other wholesale purchases to ensure a proportion of their generation originates from non-fossil fuel sources. This target was recently increased from the original goal of a 2% increase on 1997 levels (by 2010) to the equivalent of 20% generation by 2020.

While this may not directly impact on the construction of the proposed substation and transmission line, it may impact the types and scale of renewable generation applying for interconnection into the system. As some renewable energy sources (such as wind, solar etc) can be intermittent in nature, this can impact the operation and security of some electrical infrastructure.

State Policy

Queensland has reiterated the Federal Government's GHG reduction target of 60% by 2050. The Queensland State government has produced a number of policy documents regarding climate change adaptation, such as Climate Smart 2050 and the South-East Queensland Climate Change Management Plan. While not all directly applicable to the proposed transmission line and substation, the following recent policy and legislative releases (relevant to climate change) demonstrate the awareness of and rapid movement to address the management of climate change risk:

- Sustainable Planning Bill 2009;
- South East Queensland Regional Plan 2009-2031;
- Draft South East Queensland Climate Change Management Plan;
- Climate Q: towards a greener Queensland (the State's Climate Change Strategy);
- The Queensland Government has set itself a target to cut Queenslanders' carbon footprint by one third by 2020;
- Premier's Council on Climate Change;
- Draft Queensland Coastal Plan (incorporating a Draft State Policy Coastal Management and a Draft State Planning Policy Coastal Protection);
- Review of State Planning Policy 1/03 – Mitigating the adverse impact of flood, bushfire and landslide; and
- Queensland Renewable Energy Plan.

6.2.3 Air Quality

One sensitive receptor (dwelling) has been identified from aerial photography and regional investigations. The residential dwelling exists approximately 400m to the immediate west of the Project site on the adjacent property.

During the construction phase of the Project, traffic movements, unsealed access tracks, bulk earthworks and any vegetation clearing have the potential to cause dust nuisance. During construction, fugitive dust is expected in areas where bare soil is left exposed. The impact of this dust generation through vegetation clearing is considered marginal due to the size of the development footprint.

Due to the relatively remote location of the Project site, dust is not expected to be a significant nuisance to ecologically sensitive areas, or to the neighbouring resident. The emission of particulates and gaseous pollutants from vehicle exhausts, compressors and construction equipment is not likely to exceed health guidelines due to the low intensity of the construction activity. Nonetheless, prior to construction activities, landholders that may be potentially affected by fugitive dust will be notified. Maintenance activities are unlikely to cause a dust nuisance.

The proposed development is not expected to result in significant increases in odour during construction, operation or maintenance phases. The burning of vegetation will be restricted, where possible. In the event of necessary burning, odour is not expected to be a significant issue however the neighbouring landholders will be notified prior to burning activities.

6.3 MITIGATION MEASURES

6.3.1 Air Quality

Dust nuisance would be minimised by avoiding construction activities in areas with soils prone to erosion (e.g. sodic soils). In areas where erosion prone soils cannot be avoided, techniques would be employed to reduce dust emissions during both the construction and operational phases, as listed below:

- Reduce the need for unsealed access tracks by utilising sealed or gravelled access roads and reducing the length of the unsealed access tracks (i.e. position substation close to existing roads);
- Reduce unauthorised vehicle movements on access tracks (e.g. by the use of gates and signs);
- Application of mulch on exposed areas during construction; and
- Use of recycled water trucks during construction to minimise dust originating from traffic movement on access roads, bulk earthworks and other activities.

During the maintenance phase, speeds will be limited on unsealed access tracks and will be further reduced in dry, windy weather, so as to reduce fugitive dust. Dust is not expected to be a significant issue post-construction, as the majority of the Project site will be gravelled.

Further detailed measures are outlined in the EMP (see Appendix E).

7.0 HYDROLOGY

7.1 METHODOLOGY

The method for conducting the EIS for the land section of this report was in two stages; a literature review and a field investigation.

Spatial data sources (GIS framework provided with Searle *et al*, 2007; EPA wetlands mapping) were reviewed to consider topographic, drainage (including wetland and flooding), groundwater characteristics likely to exist on site.

A field investigation was undertaken during the 9th, 10th and 11th of September by a Soil and Hydrology Scientist. This included a reconnaissance of the entire project site looking for hydrologic features that were not present in the mapping, including any drainage lines, wetlands, farm dams and groundwater bores.

7.2 EXISTING ENVIRONMENT

7.2.1 Surface Hydrology

The Project site falls within the Condamine- Balonne River Catchment which covers 136,642 km² or 13 percent of the Murray Darling Basin (CSIRO, 2008). The site is located 2.5km west of Kogan Creek, a tributary of the Condamine River, which flows northwards into the Condamine River below the junction with Cooranga Creek. There are no permanent watercourses on the project site (Figure 7.1).

During the field reconnaissance the site was identified as poorly drained flat plains with poorly developed drainage lines. Four small surface storages dams (gully dams) were noted in the vicinity of the site. One was to the North of the site, two on the site, and one was to the South on Paddy Gully (approximate locations of farm dams shown in Figure 7.1. Various low embankments had been constructed on the site to direct water towards the dams.

7.2.2 Sub-surface Hydrology

The soils on the site have a tendency to waterlog at the lower part of the surface profile (see Section 5.1.2.3). This is mainly due to the topsoils being sandy and having high infiltration rates and the subsoils being very heavy clays with low infiltration capacity, thus creating a throttle on downward movement of water into the soil profile at the interface of the texture contrast. However, while waterlogging does occur, the very low slopes on this site make it unlikely there are any more than minor and localised sub-surface flows in the lower surface soils.

7.2.3 Wetlands

Wetlands have been mapped and classified for the Condamine Catchment (EPA, 2005) providing an accurate description of the extent and distribution of wetlands at the time of mapping. A search of the database did not identify any wetlands located on the site or on any adjoining land. The nearest non-riverine wetland downstream of the site was on the Condamine floodplain which is so far removed from the site as to be unaffected by activities on the site.

7.2.4 Flooding

The Project site is not subject to flood risk for the Condamine River or its tributaries. The site is several kilometres from the nearest area defined as floodplain and over 5m above the nearest floodplain level (floodplain level is approximately 320m AHD at the closest point to the east of the site) (see Figure 7.2).

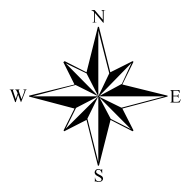
7.2.5 Groundwater

The project site is located on a regional groundwater system and no local groundwater systems are recognised for the area (Searle et al, 2007). Groundwater data for the Condamine Catchment has been summaries by Searle et al (2007). This report concludes that the sub-catchment that the project site is located within has no known salinity locations in the immediate and adjacent areas. Groundwater is estimated to be moderately deep (>10m) with an upward trend. However this groundwater rise is not relevant to the Kumbarilla landscape on which the site is located.

Powerlink Western Downs EIA Rivers and Creeks

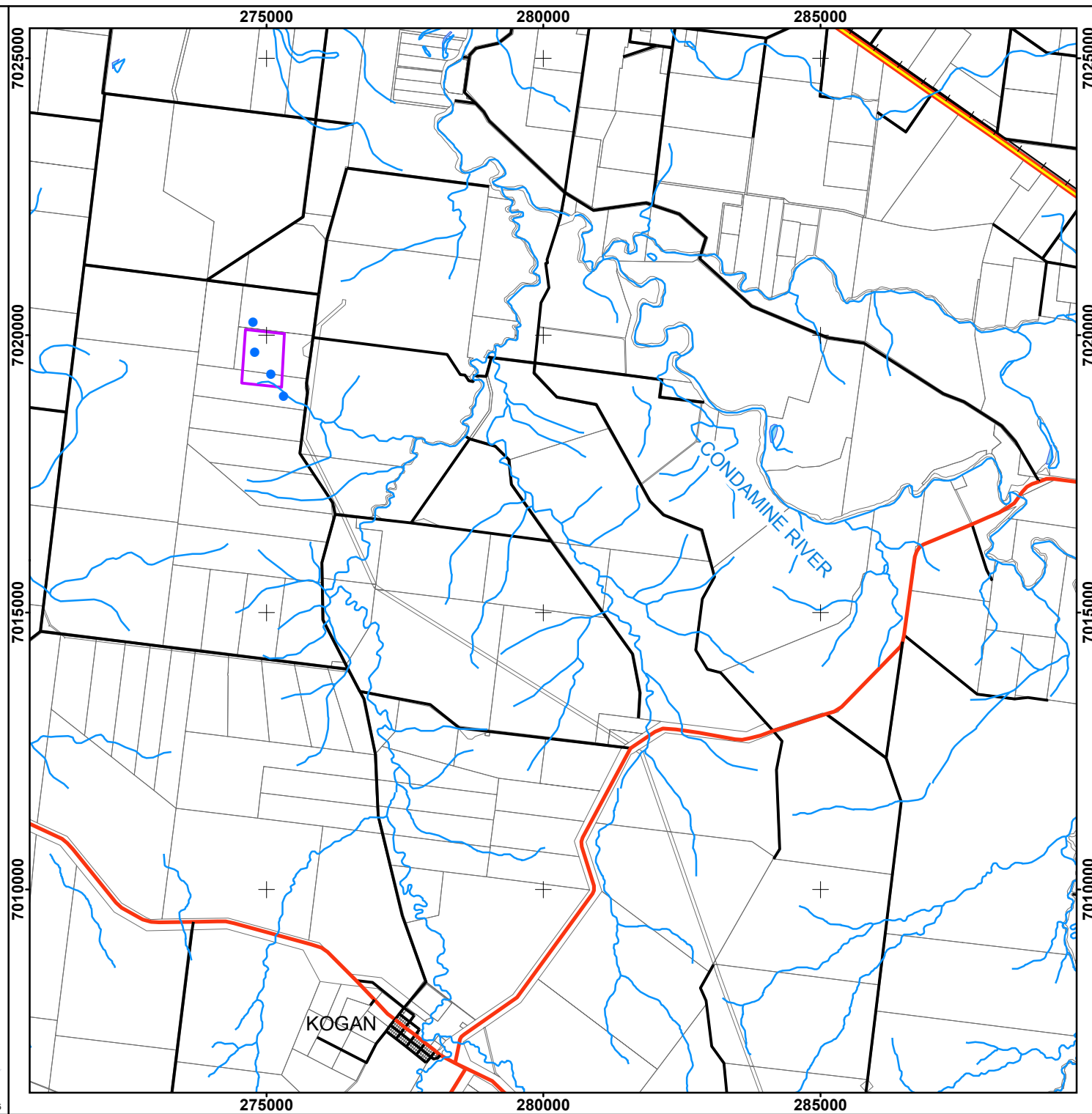
Figure 7.1

- Farm Dam
- Watercourse
- Highway
- Major Road
- Local Road
- Lake / Reservoir
- Sub-station
- Cadastre



0 500 1,000 2,000 3,000 4,000
Meters

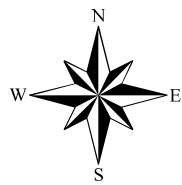
Scale 1 : 100 000
Datum / Projection: GDA94 MGA Zone 56



Powerlink Western Downs EIA Floodplain Mapping

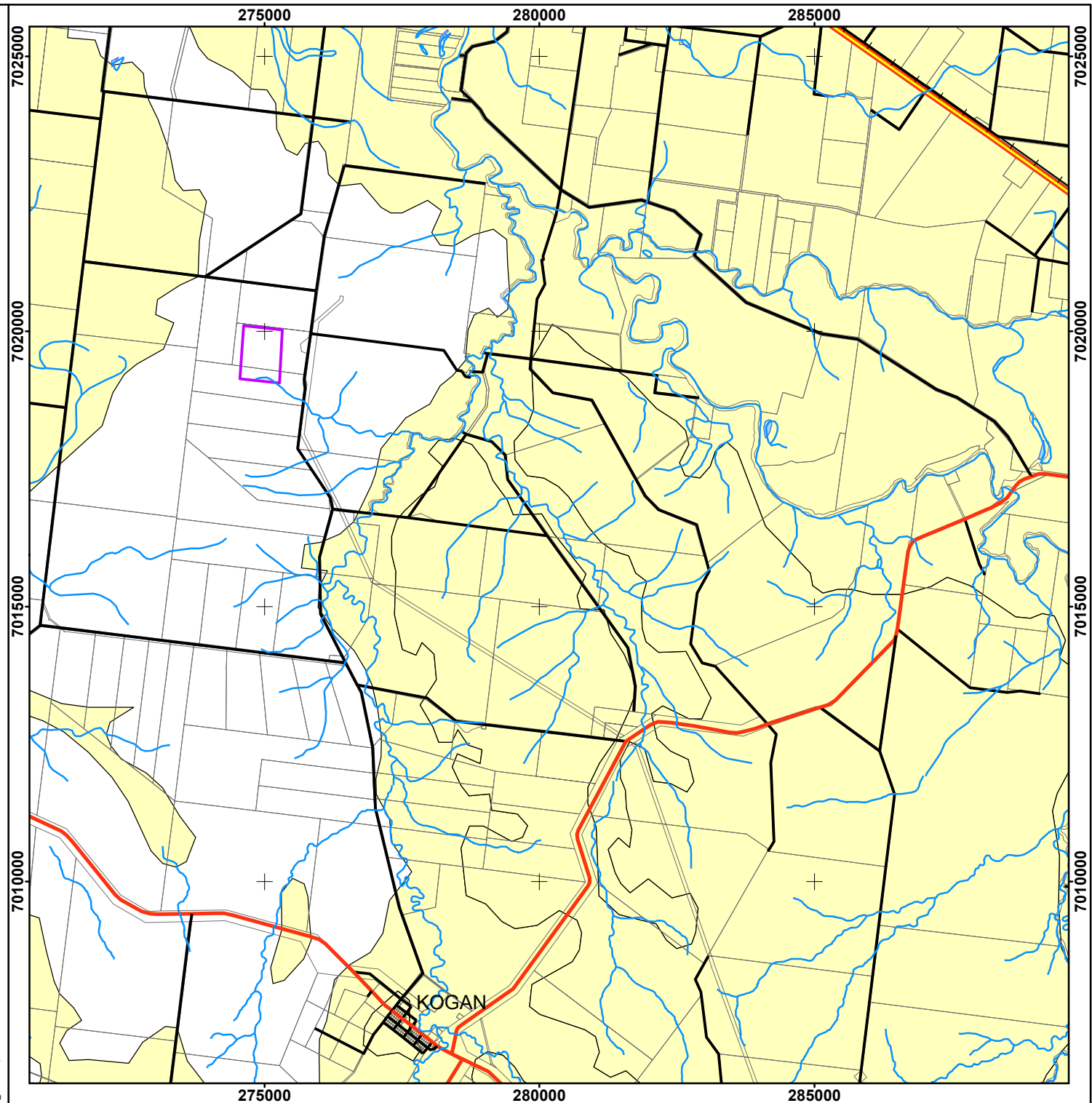
Figure 7.2

-  Watercourse
-  Highway
-  Major Road
-  Local Road
-  Lake / Reservoir
-  Sub-station
-  Cadastre
-  Floodplain



0 500 1,000 2,000 3,000 4,000
Meters

Scale 1 : 100 000
Datum / Projection: GDA94 MGA Zone 56



7.3 POTENTIAL IMPACTS

7.3.1 Surface Hydrology and Localised Flooding

As the project site is flat and the subsoils impermeable, it is likely to suffer some minor local surface water flooding during moderate rainfall events, however this flooding will be limited by the small catchment area above the site (the exact size is difficult to distinguish due to the poorly defined drainage lines and catchment boundaries).

During field reconnaissance it was noted that after <20mm of rainfall, the dams on the site were full, suggesting the site does tend to runoff easily.

There is potential for erosion on the site if water flows are concentrated and impedance of flows across the site should be minimised and sheet flow conditions (as would naturally occur) maintained as much as possible. The minor floods that can be expected to traverse the site will need to be directed around critical equipment, therefore requiring some local drainage channels and drains to divert this water.

7.3.2 Water Quality

During the construction phase of project there is the potential for surface water quality impacts to occur. These impacts relate primarily to erosion of the disturbed site, and sediment being transported via runoff to the local surface drainage network (see Section 5.2.2). In addition, potential impacts may occur from accidental spills of fuel or oil from construction equipment.

Water quality impacts may result from the following activities:

- Surface vegetation disturbance;
- Foundation excavations; and
- Stormwater runoff from the construction site, including access tracks, which could be high in suspended sediment or contain contaminants.

7.3.3 Adjacent Water Use

Given the site will represent only a minor increase in impervious area for the catchment, it is unlikely to impact on adjacent water users.

7.3.4 Groundwater

It is anticipated that groundwater is likely to occur at least 10 to 15 m below ground level (Searle et al, 2007).

Given that earthworks will be minor and foundations will extend a few metres below ground level the potential impacts to groundwater during construction is negligible. In the event that groundwater is intersected during digging for foundations, dewatering may be required. This is unlikely to be the case however, the significance of this would need to be clarified when the potential dewatering requirements are known.

Given that subsoils are characterised by extremely low permeability the risk that contaminants (e.g. spillage of fuels, lubricants and chemicals used during construction) to groundwater is highly unlikely if remediation action is conducted immediately.

7.4 MITIGATION MEASURES

7.4.1 Surface hydrology

Levelling of the site will be conducted in a fashion as to maintain sheet flow of water across the site with the aim of minimising flow concentration. Possible impediments to flow such as roads should either be constructed flat with ground level or constructed of coarse gravel to allow water to flow through.

Where bunding and drainage channels are required to direct water away from areas with critical equipment or where chemical or hydrocarbon storage is required, the bank will be pushed up from the back so not as to expose the sodic subsoils to water flows. The material used to construct the bund and drainage channels should be treated with gypsum, fertilised and seeded with grass to stabilise them as soon as possible.

Where concentration of water flows does occur due to the construction of drainage channels, the discharge points should be on a soil not susceptible to tunnel erosion and be well grassed.

All works are to be undertaken in accordance with the EMP (see Appendix E).

7.4.2 Water Quality

Erosion and sediment controls will be used during construction to ensure sediment-laden runoff does not impact on water quality within the local drains (see Section 5.3.3.1).

However in addition to these erosion and sediment control techniques the following recommendations are made:

- Appropriate bunding around chemicals and hydrocarbons, and maintaining equipment, will limit water quality impacts; and
- The farm dam to the south of the site, on Paddy Gully, will be preserved as a retention basin for the purposes of water quality (to trap sediment) and quantity control.

All works are to be undertaken in accordance with the EMP (see Appendix E).

7.4.3 Groundwater

In the event that an environmental incident occurs during construction, such as a fuel or oil spill, immediate containment, management and remediation actions should be undertaken to ensure migration of the contaminants into groundwater does not occur.

8.0 FIRE

This section describes aspects of the environment surrounding the Project site that are relevant to the generation and spread of uncontrolled fire. Reference has been made to bushfire hazard information prepared by local and State authorities.

This section discusses the likely causes of fire as a consequence of the activities associated with the construction and maintenance of the proposed development, and addresses the potential impact of bushfires on the proposed development. Mitigation measures have been provided to reduce the potential impacts of uncontrolled fires on the Project and the surrounds.

8.1 BACKGROUND & METHODOLOGY

Assessment of the risk of fire and the impact it may have on the proposed development is discussed within this section. Additionally, the likely cause of bushfire as a result of construction and maintenance activities related to the proposed development is considered.

The 'State Planning Policy 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide' (SPP 1/03), contains a bushfire hazard assessment methodology, which uses three characteristics to determine the level of bushfire hazard within an area: vegetation, slope, and aspect. In the SPP 1/03 vegetation is used as the primary determinant of bushfire hazard and is scored out of 10. If an area has a vegetation score of 2 or less, the guidelines states that no further assessment of the bushfire hazard is required as it is not deemed to be hazardous vegetation. However, if the vegetation characteristic is scored greater than 2 then slope and aspect are also scored to provide a rating for each characteristic and these are then added to provide total scores which is used to determine the Severity of Bushfire Hazard. Slope and Aspect are scored out 5.

8.2 EXISTING ENVIRONMENT

Areas of bushfire risk, as determined by the Queensland Rural Fire Service, have been identified on Western Downs Regional Council's Chinchilla Town Planning Scheme Overlay Map 4 *Bushfire Hazard Areas*. The mapping identifies the Project site as occurring within a Low to Medium Bushfire Hazard classified area.

An assessment of three main determinants of bushfire hazard severity (vegetation, slope, aspect) was conducted during preliminary site investigations. Akin to the Council mapping, field verification of the condition of the site has resulted in a low to medium bushfire hazard rating.

8.3 POTENTIAL IMPACTS

The impacts of bushfires generally depend on the location, the physical characteristics of land and the type of development. Bushfires occur on a variety of vegetation and topography types where there is a flammable fuel path.

The prevailing fire regime is unlikely to be significantly altered due to the Project. Although no noticeable change in the local fire regime is expected, the intensity and occurrence of fires may actually be reduced by the presence of the substation, particularly due to vegetation/fuel clearing. The most probable time for a fire to occur is during construction, however the risk of such an event occurring during this phase of the development is considered low.

Fire may potentially arise from construction machinery/equipment as a result of ignition of dry flammable materials on site. Excessive heat generated by machinery/vehicles, sparks, and/or careless disposal of cigarettes and matches pose the highest risk to the Project locale. Flammable matter providing the highest fire risk on site includes stockpiles of mulched/chipped vegetation, dead/dry on-site vegetation, and paper. Fuel, oil and flammable chemicals increase the risk of fire.

In accordance with the SPP 1/03, the proposed development, although located within a natural hazard management area (bushfire), it is designed to function effectively during and immediately following bushfire events.

8.4 MITIGATION MEASURES

The following mitigation measures will reduce the risk and impact of a fire on the proposed development and surrounding areas:

- A Bushfire Management Plan would be prepared and adhered to;
- Materials used for the construction of the substation will be fire resistant in order to reduce the chance of damage the substation;
- All mobile construction equipment would be fitted with spark arresters to prevent accidental spark ignition;
- Where naked flames are required (e.g. when oxy-acetylene is used) two full fire extinguishers shall be located within 10m of the work face;
- All construction sites would have fire extinguishers and first aid officer/s;
- In the unlikely event of a fire, emergency exit plans would be utilised;
- Water trucks will be present, when practicable, on construction sites that are in areas identified as a potential fire risk; and
- The relevant emergency services (e.g. Fire Rescue and Ambulance Services) would be notified of the numbers and location of construction personnel and any proposed temporary road closures.

All works are to be undertaken in accordance with the EMP (see Appendix E).

9.0 WASTE MANGEMENT

This chapter provides information relating to waste produced as a result of the Project during the construction, operation and maintenance phases. A description of waste management and disposal of materials including oils and lubricants, water, solid waste, vegetative waste and regulated waste has also been provided. A description of the origin, quality and quantity of wastewater originating from the Project is also provided along with the sewerage infrastructure required for the substation site.

Information is also provided about on-site treatment of any regulated wastes and proposed waste avoidance, reuse, recycling, treatment and disposal have been described having regard for best practice waste management strategies and the *Environmental Protection (Waste) Policy*.

9.1 POTENTIAL WASTE GENERATION DURING CONSTRUCTION & OPERATION

The likely wastes that are to be generated during the construction and operational phases of the Project are outlined in Table 9-1. The majority of the wastes for the Project will be from the construction of the new substation. Waste production during the operational phase of the Project will be minimal in comparison and associated with scheduled maintenance activities of the substation facility and easements.

TABLE 9-1 POTENTIAL WASTES GENERATED DURING CONSTRUCTION & OPERATIONAL PHASES

WASTE TYPE	WASTE CLASSIFICATION*	SOURCE
Construction		
Vegetation	General	Clearing works
Existing dumped rubbish (e.g. vehicle bodies, mattresses, fridges, rusted drums)	General	Previous illegal dumping activities
Topsoil & excess spoil	General	Bulk earthworks for substation pad, foundations and transmission footings
Waste gravel & concrete	General	Substation pad, foundations and transmission footings.
Domestic rubbish (e.g. food scraps, packaging, paper, bottles, cans etc)	General	Construction workers & on-site work office
Waste drums & tins	Regulated	Refueling & vehicle maintenance activities
Residual construction material	General	Construction activities
Timber pallets	General	Packing material
Waste oils	Regulated	Vehicle maintenance activities
Sewage	Regulated	Construction workforce
Residual fuel	Regulated	Refueling activities
Residual chemicals	Regulated	Construction activities
Waste water	General / Regulated	Cleaning & washing down
Operation		
Vegetation	General	Substation & easement maintenance

WASTE TYPE	WASTE CLASSIFICATION*	SOURCE
Waste oils	Regulated	Equipment & plant maintenance
Chemicals	Regulated	Cleaning substation grounds
Waste water	General	Cleaning substation grounds
Scrap metal	General / Regulated	Substation maintenance
Sulphur hexafluoride (SF ₆) gas cylinders	Regulated	Substation maintenance
Defective equipment	General	Substation maintenance
Sewage	Regulated	Maintenance workforce

*Waste Classification as defined under the *Environmental Protection Act 1994*

9.2 MITIGATION MEASURES

General and regulated waste will be produced as a result of the construction and operation of the substation. However, waste generation and potential associated impacts are considered to be similar to other general industrial projects. The potential impacts of waste generation can easily be mitigated and managed by adopting appropriate waste disposal and tracking procedures, as well as adhering to waste management strategies as outlined in Section 20.0. Sulphur hexafluoride gas (SF₆) is an operational additive which will be used during operation of the substation. This gas is dealt with in Section 18.

Waste management strategies are based on the principles of the waste hierarchy outlined in the *Environmental Protection (Waste Management) Policy 2000* and the Queensland Government Recycling Policy for Buildings and Civil Infrastructure 2009, which promotes the following actions in order of preference:

- Waste avoidance;
- Waste reuse;
- Waste recycling;
- Energy recovery; and
- Waste disposal.

The following sections outline the waste management strategies to be employed for each waste type potentially generated during the construction and operational phases of the project. The waste management strategies are based on the waste hierarchy principles, and will assist in mitigating the potential impacts of the project. All works are to be undertaken in accordance with the EMP (see Appendix E).

9.2.1 Solid Waste Disposal

WASTE TYPE	WASTE MANAGEMENT STRATEGY
Solid	
Vegetation	▪ Cleared native vegetation will be sold as mill timber, reused for fencing or chipped into mulch to be used for stabilizing (erosion control), landscaping and rehabilitation works on the site. Vegetation may also be stacked on site for future disposal.
Existing dumped rubbish (e.g. vehicle	▪ Dumped rubbish on the site will be segregated into recyclable items i.e. scrap metal. Other items will be collected as general waste by a licensed contractor for disposal at

WASTE TYPE	WASTE MANAGEMENT STRATEGY
bodies, mattresses, fridges, rusted drums)	a licensed waste facility. Any old drums that appear to have contained chemical based material will be collected by a licensed contractor for treatment and disposal at a licensed waste facility.
Topsoil & excess spoil	Topsoil & excess spoil will be stockpiled on site for reuse during landscaping and rehabilitation works.
Waste gravel & concrete	Waste gravel & concrete will be reused where possible and disposed of off-site.
Domestic rubbish (e.g. food scraps, packaging, paper, bottles, cans etc)	Recycling and general waste bins will be situated on-site. Domestic rubbish is to be segregated into recyclable items and collected by a licensed contractor for disposal at a licensed general waste or recycling facility.
Waste drums & tins	Liquids within drums & tins are to be completely used. Waste drums & tins that contained hazardous material are to be kept within a bunded area until collected by a licensed contractor for treatment & disposal at a licensed facility. Waste drums & tins not containing hazardous material are to be recycled off-site.
Residual construction material	Left over construction material will be reused where possible, returned to suppliers or disposed of off-site.
Timber pallets	Timber pallets will be returned to the material supplier, collected for recycling off-site or collected as general waste by a licensed contractor for disposal at a licensed waste facility.
Scrap metal	Scrap metal to be reused (if practical) or recycled off-site.
Defective equipment	Equipment will be reused where possible or recycled off-site as scrap metal. Any equipment containing hazardous substances will be collected and disposed of by a licensed contractor.

9.2.2 Liquid Waste

WASTE TYPE	WASTE MANAGEMENT STRATEGY
Liquid	
Waste oils	Waste oils will be collected by a licensed contractor for treatment & recycling at a licensed facility. No oil or waste oils will be stored on-site.
Sewage	- During construction, portable toilets will be used and serviced by a licensed contractor; or an appropriate treatment facility/septic tank will be used to process sewerage during the construction phase. - During the operational stage, sewage will be contained and treated within the on-site septic tank, which will be serviced by a licensed contractor.
Residual fuel	Unused fuel will be reused where possible and removed from the site. No large quantities of fuel will be stored on-site.
Residual chemicals	- Unused chemical will be reused where possible and removed from the site. No large quantities of chemicals will be stored on-site. - Unused chemicals will be reused for future or other maintenance work. Empty containers will be refilled and reused or collected by a licensed contractor for treatment, recycling or disposal at a licensed facility.
Waste water	- Unless a suitable wash down facility has been established on site, vehicles and machinery are not to be cleaned on site. Waste water containing hazardous substances are to be contained and not released on site; and - Waste water containing hazardous substances are to be contained and not released on site. Waste water will be treated within the on-site septic tank.

10.0 FLORA AND FAUNA

10.1 METHODOLOGY

The methodology adopted for terrestrial flora and fauna study involved two stages:

- A desktop review of background information; and
- Field investigations.

10.1.1 Background Review

A number of documents, databases and relevant legislation (Federal, State and local) were considered during this ecological assessment and included:

- Department of Environmental and Resource Management (DERM) Wildlife Online records (DERM 2009);
- Queensland Herbarium (HERBRECS);
- Aerial photography;
- Environment Protection & Biodiversity Conservation (EPBC) Act Protected Matters Database (DEWHA 2009); and
- DERM Regional Ecosystem Mapping (V5.0) (DERM 2009).

In addition to this, the conservation status of flora and fauna species occurring on the Project site have been assessed in the Commonwealth and State context with reference to the EPBC Act and *Nature Conservation Act 1992* (NC Act).

10.1.2 Field Investigations

An ecological field survey was undertaken during the 9th, 10th and 11th of September by two ecologists. The survey included:

- Mapping and description of the vegetation communities present;
- Verification of DERM RE mapping;
- Determination of the likelihood of threatened species;
- Targeted searches for significant flora and fauna and associated habitat that may occur on the Project site;
- Preliminary assessment of fauna habitat and other ecological values;
- Bird searches at dawn and dusk (9 person hours);
- Flora inventory searches (16 person hours); and
- Active reptile searches (3 person hours).

10.2 EXISTING ENVIRONMENT

10.2.1 Terrestrial Flora

10.2.1.1 Vegetation Communities

Regional Ecosystems

A review of the RE mapping shows that there is mapped remnant vegetation within the Project study area. This mapped RE also is found across the proposed substation location. This remnant woodland that covers approximately half of the proposed substation site is mapped as a single polygon containing two Regional Ecosystems (see Figure 10.1). Table 10-1 provides a description of the REs and their VMA status. Vegetation Communities 1 and 3 (survey sites PSS2, 4, 5 and 6) with a minor portion of Vegetation Community 2 are included in the mapped RE area.

TABLE 10-1 RE 11.5.1/11.5/20 (60/40) MAPPED ON THE PROJECT SITE

RE CODE	RE DESCRIPTION	VMA STATUS
11.5.1	<i>Eucalyptus crebra</i> , <i>Callitris glaucophylla</i> , <i>Angophora leiocarpa</i> , <i>Allocasuarina luehmannii</i> woodland on Cainozoic sand plains/remnant surfaces	Not of Concern
11.5.20	<i>Eucalyptus moluccana</i> and/or <i>E. microcarpa</i> , <i>E. pilligaensis</i> with <i>E. crebra</i> woodland on Cainozoic sand plains.	Not of Concern

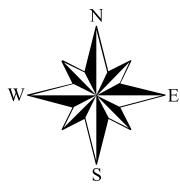
RE mapping for the site is generally accurate, however the remnant vegetation is more consistent with the description for 11.5.1 rather than 11.5.20. There are only minor discrepancies in the extent of remnant vegetation mapped on the site.

Powerlink Western Downs EIA

Mapped Remnant Vegetation

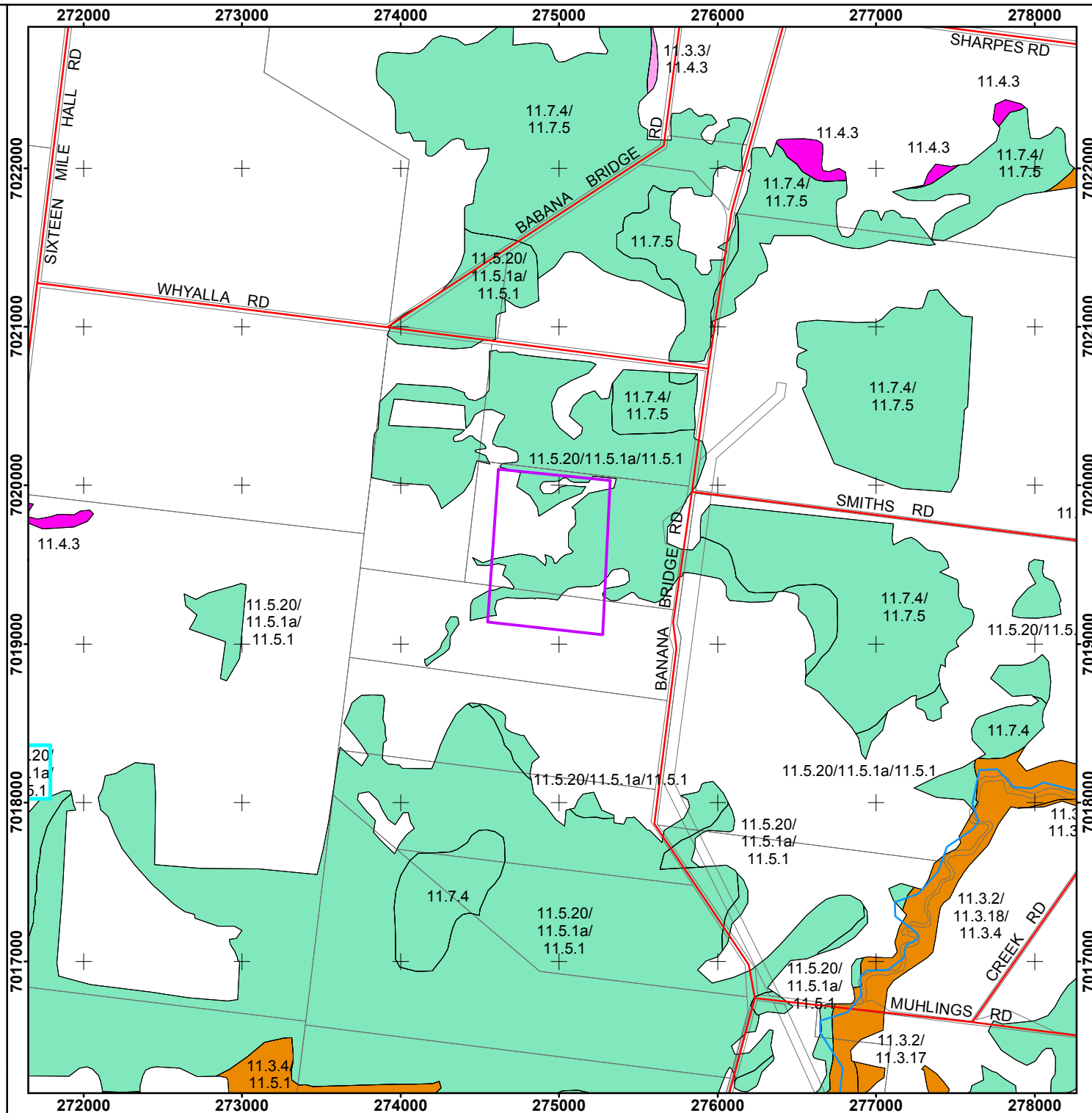
Figure 10.1

- Watercourse
 - Road
 - Sub-station
 - Cadastre
- Regional Ecosystems**
- Non-remnant / regrowth
 - Endangered - Sub-dominant
 - Endangered - Dominant
 - Of Concern - Sub-dominant
 - Of Concern - Dominant
 - Not Of Concern
 - Plantation forest



0 125 250 500 750 1,000 1,250 1,500
Meters

Scale 1: 35 000
Datum / Projection: GDA94 MGA Zone 56



Observed Vegetation Communities

Five vegetation communities were identified on the site by aerial photograph interpretation and ground-truthing (see Figure 10.1). Six sites were surveyed to describe the floristic composition and condition.

Vegetation Community 1

The proposed substation site is dominated by a Eucalypt Woodland that is contiguous with bushland to the north and east of the substation site. The canopy consists of Narrow-leaved Ironbark (*Eucalyptus crebra*), Rusty Gum (*Angophora leiocarpa*), Grey Box (*Eucalyptus microcarpa*) and Poplar Box (*Eucalyptus populnea*) with an average height of approximately 15m. Portions of this community appear to have been historically disturbed, with numerous fallen timber located throughout the area and dominance of immature regrowth vegetation in certain patches.

The mid-storey consists of dense layer of Bull-oak (*Allocasuarina luehmannii*) and White Cypress (*Callitris glaucophylla*) as well as immature canopy species, particularly Poplar Box. The shrub layer is sparse with scattered Cattle Bush (*Pittosporum angustifolium*), Black Wattle (*Acacia leiocalyx*), *Acacia ixiophylla*, False Sandalwood (*Eremophila mitchellii*) and Wilga (*Geijera parviflora*) occurring. The patchy groundcover is dominated by native grasses, particularly Dark Wiregrass (*Aristida calycina*), Native Millett (*Panicum decompositum*), *Aristida queenslandica*, Woodland Lovegrass (*Eragrostis sororia*) and Barbed-wire Grass (*Cymbopogon refractus*). Other common groundcovers include Sword-sedge (*Gahnia aspera*), Spiny-headed Mat Rush (*Lomandra longifolia*), Mulga Fern (*Cheilanthes sieberi*) and Blue Flax Lily (*Dianella caerulea* var. *producta*). Patches of regrowth dominated by Bull-oak and White Cyprus have a dense layer of leaf litter.

Occasional Prickly Pear (*Opuntia stricta*), a declared weed species, occur in this area.

This vegetation community is analogous with RE 11.5.1 (*Eucalyptus crebra*, *Callitris glaucophylla*, *Angophora leiocarpa*, *Allocasuarina luehmannii* woodland on Cainozoic sand plains/remnant surfaces).

PLATE 1

VEGETATION COMMUNITY 1



Vegetation Community 2

This community occurs in the southern portion of the proposed substation site and consists of a Poplar Box Open Woodland with a grassy understorey. Scattered Queensland Blue Gum (*Eucalyptus tereticornis*) and Grey Box also occur in the canopy. Scattered shrubs and small trees generally occur and include False Sandalwood, Sticky Hop Bush (*Dodonaea viscosa* subsp. *spatulata*) and Bull-oak. The western portion of this community has a moderately dense shrub cover.

The ground layer consists of a dense cover of native grasses such as Dark Wiregrass, Native Millett, Woodland Lovegrass, Browns Lovegrass (*Eragrostis brownii*), Barbed-wire Grass and Windmill Grass (*Chloris truncata*). Chenopods such as Black Roly-poly (*Sclerolaena muricata*), Soda Bush (*Neobassia proceriflora*) and Woolly-spined Burr (*Sclerolaena lanicuspis*) are also very common through this area. Other groundcovers include Yellow Buttons (*Chrysocephalum apiculatum*), Spiny-headed Mat Rush and Mulga Fern.

The declared weed species Fireweed (*Senecio madagascariensis*) occurs in this community.

This vegetation community is analogous with RE 11.5.1a (*Eucalyptus populnea* woodland with *Allocasuarina luehmannii* low tree layer).

PLATE 2

VEGETATION COMMUNITY 2



Vegetation Community 3

This area occurs in the south-west corner of the proposed substation site. The canopy is similar to that of Vegetation Community 1, however Rusty Gum and Grey Box are the dominant species and Blue-leaved Ironbark (*Eucalyptus fibrosa* subsp. *nubila*) replaces Narrow-leaved Ironbark. The mid-storey consists primarily of Poplar Box. This area has been recently disturbed with numerous trees felled and much of the understorey cleared.

Remaining shrubs in the area consist of *Acacia ixiophylla*, Broombrush (*Melaleuca uncinata*) and Sandalwood (*Santalum lanceolatum*). The ground layer is very sparse with heavy leaf litter present. Scattered native grasses include Dark Wiregrass and *Aristida queenslandica* with Spiny-headed Mat Rush and White Paper Daisy also occurring. This vegetation community is analogous with RE 11.5.1 (*Eucalyptus crebra*, *Callitris glaucophylla*, *Angophora leiocarpa*, *Allocasuarina luehmannii* woodland on Cainozoic sand plains/remnant surfaces).

PLATE 3

VEGETATION COMMUNITY 3



Vegetation Community 4

This vegetation community occurs in the western portion of the site and consists of retired grazing land and plantations. The canopy is absent in this area with only scattered Eucalypt regrowth occurring as well as a plantation of Date Palms (*Phoenix roebelinii*). The disturbed vegetation consists of grasses such as Dark Wiregrass, Barbed-wire Grass, *Aristida queenslandica* and Purple Wiregrass (*Aristida ramosa*) as well as White Paper Daisy, Spiny-headed Mat Rush. Bluebells (*Wahlenbergia gracilis*), Yellow Buttons, Mayne's Pest (*Verbena tenuisecta*) and Fireweed are also common.

This area is non-remnant and is not consistent with any Regional Ecosystem.

PLATE 4

VEGETATION COMMUNITY 4



Vegetation Community 5

This area occurs in the western portion of Lot 4 and is outside of the proposed substation site. The area appears to have been previously cleared as it is dominated by pioneering species, especially Bull-oak, with scattered regrowth Poplar Box and Grey Box evident. The low canopy is dominated by Bull-oak with White Cypress and scattered Rusty Gum present. The shrub layer consists of Black Wattle, False Sandalwood and dense patches of Sticky Hop Bush.

PLATE 5

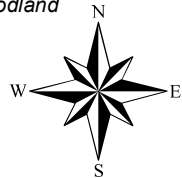
VEGETATION COMMUNITY 5



Powerlink Western Downs EIA Mapped Vegetation Communities

Figure 10.2

- Field Survey Site
 - Watercourse
 - Road
 - Sub-station
 - Cadastre
- Vegetation Communities**
- Cleared
 - Vegetation Community 1
Eucalyptus crebra and *Angophora leiocarpa* Woodland
 - Vegetation Community 2
Eucalyptus populnea
Open-woodland
 - Vegetation Community 3
Angophora leiocarpa and *Euc. fibrosa* subsp. *nubila* Woodland
 - Vegetation Community 4
Exotic Grassland and Retired Plantation
 - Vegetation Community 5
Allocasuarina leuhmannii and *Calltris glaucophylla* Open Woodland



0 50 100 200 300 400 500 600
Meters

Scale 1: 15 000
Datum / Projection: GDA94 MGA Zone 56



10.2.1.2 Threatened Species

The potential occurrence of significant flora and fauna species listed under the NCA and EPBC Act were identified through Wildlife Online and EPBC database searches. It should be noted that whilst the Wildlife Online database is based on records, the EPBC database is not. The review of both database sets identified 8 federally significant and 9 state significant flora species that may occur on the site. An assessment of the potential occurrence of these species within the Project site has been made on an understanding of the species preferred habitat and knowledge of type and condition of habitat present within the Project site (see Table 10-2).

No significant flora species listed under the EPBC or NCA were recorded during the field investigations undertaken by Conics. However, *Philothea sporadica* has been recorded in the vicinity of the project site and suitable habitat occurs on the site, particularly Vegetation Community 1. However extensive searches for the species failed to identify any individuals on the site.

The detectability of plants and ability to accurately identify plants to species level may vary greatly with the time of year, prevailing climatic conditions and the presence of reproductive material (e.g. flowers, fruit and/or seed capsules). Consequently, the survey conducted for the Project should not be regarded as conclusive evidence that certain species do not occur on the Project Site.

TABLE 10-2 LIKELIHOOD OF SIGNIFICANCE FLORA SPECIES OCCURRENCE

SPECIES	COMMON NAME	NCA STATUS	EPBC STATUS	HABITAT	LIKELIHOOD OF OCCURRENCE
<i>Eucalyptus curtisii</i>	Plunkett Mallee	R		Sandstone ridges in woodland / open forest	Unlikely due to lack of suitable habitat.
<i>Philothea sporadica</i>		V	V	Condamine River catchment on soils derived from low fertility laterised Cretaceous sandstones	Possible. Vegetation Community 1 contains suitable habitat, however none were observed on site.
<i>Solanum papaverifolium</i>		E		Grows in heavy clay soils, sometimes as a weed of crops	Unlikely due to lack of suitable habitat.
<i>Acacia chinchillensis</i>		NT	V	Confined to sandy or gravelly soil in the Chinchilla area.	Possible.
<i>Cadellia pentastylis</i>	Ooline	V	V	Occurs in vine thickets or dry rainforest, and more rarely woodlands. It is a relict rainforest species and tends to favour upper and mid slope positions, often with a northerly aspect. It commonly occurs on sandy-loam to clay soils of low to medium fertility	Unlikely due to lack of suitable habitat.
<i>Dichanthium queenslandicum</i>	King Blue-grass	V	V	Confined to black clay soils that support Bluegrass	Unlikely due to lack of suitable habitat.

SPECIES	COMMON NAME	NCA STATUS	EPBC STATUS	HABITAT	LIKELIHOOD OF OCCURRENCE
				communities.	
<i>Digitaria porrecta</i>	Finger Panic Grass	R	E	Grasslands and grassy woodlands, particularly Qld bluegrass communities	Possible however unlikely due to lack of suitable habitat.
<i>Diuris sheaffiana</i>	Tricolour Diuris		V	Dry sclerophyll woodland and forest among grass; often with <i>Callitris</i> . Soils are often sandy or lateritic and landform ranges from flat to low lateritic hills	Possible.
<i>Homopholis belsonii</i>	Belson's Panic	E	V	Dry woodlands including Mountain Coolibah, Wilga, Poplar Box and Belah, on basaltic and other soils.	Possible but unlikely due to lack of suitable habitat.
<i>Rhaponticum australe</i>	Austral Cornflower	V	V	Grasslands and grassy woodlands on heavy soils	Unlikely due to lack of suitable habitat.

(Source: Wildlife Online (EPA) & EPBC Database (DEWHA))

E = Endangered V = Vulnerable R= Rare NT= Near Threatened

10.2.1.3 Weeds of Management Concern

Three declared weed species, listed under the *Land Protection (Pest and Stock Route Management) Act 2002* (LPA), were identified during the ecological assessment. These were:

- *Senecio madagascariensis* (Fireweed) - Class 2 Declared Plant;
- *Opuntia tomentosa* (Velvety Tree Pear) - Class 2 Declared Plant; and
- *Opuntia stricta* (Prickly Pear) – Class 2 Declared Plant.

These species occur as scattered individuals or small open clumps throughout the Project site, primarily in the lightly timbered areas. Under the LPA, landowners must take reasonable steps to keep land free of Class 2 plants.

Species occurring on the property that are not declared under the LPA but are generally considered as environmental weeds can be viewed in the flora species list in Appendix C.

10.2.2 Terrestrial Fauna

10.2.2.1 Fauna habitats

The majority of the site is well vegetated and therefore provides habitat for a range of fauna species. In particular Vegetation Community 1 is generally structurally complex with a good cover of canopy, shrubs and ground cover vegetation. These areas provide excellent cover and resources for local fauna including forest dependant species such as Thornbills (*Acanthiza* spp.), Rufous Whistler (*Pachycephala rufiventris*), Scarlet Honeyeater (*Myzomela sanguinolenta*), White-throated Gerygone (*Gerygone olivacea*) and Brown-headed Honeyeater (*Melithreptus brevirostris*) that were recorded in this habitat.

Flowering Eucalypts in this area were heavily utilised by Honeyeaters and Friarbirds during the survey. It is also likely that nocturnal fauna such as gliders, possums and flying-foxes also feed on Eucalypt nectar. A dense cover of leaf litter as well as ground cover provides excellent cover for cryptic species including reptiles.

Within Vegetation Community 1, patches appear to have been disturbed through historical clearing. While these areas lack the diversity and structure of the majority of the community, fallen timber commonly occurs that provides additional habitat for snakes, skinks and small mammals.

More modified habitats such as Vegetation Communities 2, 3, 4 and 5 are preferable habitat for generalist species that can out-compete specialists for the limited resources. Consequently these areas are dominated by Noisy Miner (*Manorina melanocephala*), Crested Pigeon (*Ocyphaps lophotes*), Australian Magpie (*Gymnorhina tibicen*), Butcherbirds (*Cracticus* spp.), Torresian Crow (*Corvus orru*) and Willie Wagtail (*Rhipidura leucophrys*). White-winged Fairy-wren (*Malurus leucopterus*) and Superb Fairy-wren (*Malurus cyaneus*) were common throughout the Date Palm plantation and surrounding regrowth vegetation.

Three farm dams across the site provide water sources and habitat for native fauna. Grey Teal (*Anas gracilis*), White-necked Heron (*Ardea pacifica*) and Pacific Black Duck (*Anas superciliosa*) were observed in these areas.

10.2.2.2 Fauna Diversity

The site provides limited habitat diversity. It is likely that the entire site consisted of a largely homogenous habitat prior to human intervention, with some localised variation of dominant flora species. Human disturbances including clearing for infrastructure (residents, tracks and dams), as well as agricultural and grazing activities has provided additional habitats, however these areas are generally low biodiversity value. Consequently only 48 fauna species were recorded during the survey. This consisted primarily of birds (43) with only one reptile and four mammal species observed.

The modified habitats provided by Vegetation Communities 2, 3, 4 and 5 lack the cover, structure and flora species requirements for many local native species. Therefore these typically forest dependant species are unlikely to frequently utilise these areas for foraging, roosting or breeding. These disturbed habitats have allowed for generalist fauna to dominate the sites fauna population. Many of these species will out-compete other native fauna for resources and often display aggressive behaviour in these habitats as well as the edges of more vegetated habitats.

However the more intact areas of Vegetation Community 1 provide excellent habitat for forest specialists. It is likely that this habitat supports a variety of native fauna. Accordingly, reasonable numbers of forest birds were recorded within this area. It is also likely that small mammals and reptiles frequently occur in these areas due to the dense cover provided by deep leaf litter and understorey vegetation.

10.2.2.3 Fauna of Conservation Significance

No significant fauna species listed under EPBC or NCA were recorded during the field investigations undertaken by Conics. The review of both Wildlife Online and EPBC database searches identified 21 federally significant and 16 state significant fauna species that may occur on the site. An assessment of the potential occurrence of these species within the Project site has been made on an understanding of the species preferred habitat and knowledge of type and condition of habitat present within the Project site (see Table 10-3).

Although no significant fauna species were recorded during the site assessment, suitable habitat occurs for several species. Several migratory species, such as Cattle Egret (*Ardea ibis*), Rainbow Bee-eater (*Merops ornatus*) and White-throated Needletail (*Hirundapus caudacutus*), are considered likely to utilise the site periodically. However these species commonly occur in the area and the site is unlikely to provide important breeding habitat.

Threatened species that the site provides potential habitat for include Square-tailed Kite (*Lophoictinia isura*), Swift Parrot (*Lathamus discolor*), Major Mitchell's Cockatoo (*Lophochroa leadbeteri*) and Turquoise Parrot (*Neophema pulchella*). However only the densely vegetated areas (i.e. Vegetation Community 1) of the site provide suitable habitat for the Square-tailed Kite and Swift Parrot and the site is at the outer range limits for both the Major Mitchell's Cockatoo and Turquoise Parrot. Suitable habitat for these species also occurs throughout the area and broader region.

TABLE 10-3 LIKELIHOOD OF OCCURRENCE OF THREATENED FAUNA SPECIES

SPECIES	COMMON NAME	NCA STATUS	EPBC STATUS	HABITAT	LIKELIHOOD OF OCCURRENCE
Reptiles					
<i>Furina dunmalli</i>	Dunmall's Snake	V	V	Prefers Brigalow (<i>Acacia harpophylla</i>) forest and woodland growing on cracking black clay and clay loam soils on the Darling Downs.	Unlikely due to lack of suitable habitat.
<i>Hemiaspis damelii</i>	Grey Snake	E	-	Favours cracking flood-prone soils in the Brigalow Belt. Shelters in soil cavities.	Unlikely due to lack of suitable habitat.
<i>Anomalopus mackayi</i>	Five-clawed Worm-skink	E	V	Natural grasslands on deep cracking clays.	Unlikely due to lack of suitable habitat.
<i>Tympanocryptis pinguicollis</i>	Grassland Earless Dragon	E	V	All specimens are known from highly modified agricultural land. Large areas of native and introduced grasses existing as headlands, and along drainage lines are a feature of the farmlands where the dragon exists. Soils are essentially black, cracking clays of the Condamine River flood plain.	Unlikely due to lack of suitable habitat.
Aves					
<i>Apis pacificus</i>	Fork-tailed Swift	-	M	Low to very high airspace over varied habitat, rainforest to semi-desert.	Possible fly-over
<i>Ardea alba</i>	Great Egret	-	M	Wetlands, flooded pastures, dams, estuarine mudflats, mangroves and reefs.	Possible intermittent occurrence at dams
<i>Ardea ibis</i>	Cattle Egret	-	M	Wide range of open habitats from grazing paddocks to wetlands and tidal mudflats.	Possible intermittent occurrence at dams and cleared areas
<i>Lophoictinia isura</i>	Square-tailed Kite	R	-	Eucalyptus woodland, open forest and heath-woodland.	Possible occurrence.
<i>Erythrotriorchis radiatus</i>	Red Goshawk	E	V	Open forests, woodlands especially near rivers, wetlands, rainforest fringes	Remote possibility
<i>Gallinago hardwickii</i>	Latham's snipe	-	M	Soft wet ground or shallow tussocks and other green or dead growth.	Possible intermittent occurrence at dams
<i>Geophaps scripta scripta</i>	Squatter Pigeon	V	V	Grassy understorey of eucalypt woodland, usually with ready access to water	Potentially suitable habitat but unlikely to be present
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	-	M	Usually coastal, over islands, reefs, headlands, beaches, bays, estuaries, mangroves, seasonally flooded inland swamps, lagoons and floodplains.	Unlikely due to lack of suitable habitat.
<i>Hirundapus caudacutus</i>	White-throated Needletail	-	M	High open spaces above almost any habitat.	Probably fly-over
<i>Lathamus discolor</i>	Swift Parrot	E	E	Eucalypt forests and woodlands, plantations and banksias	Possible sporadic occurrence when ironbark in flower

SPECIES	COMMON NAME	NCA STATUS	EPBC STATUS	HABITAT	LIKELIHOOD OF OCCURRENCE
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	V	-	Forests and woodlands with abundant Casuarina trees.	Unlikely due to lack of suitable habitat.
<i>Lophochroa leadbeteri</i>	Major Mitchell's Cockatoo	V	-	Open, sparsely timbered grasslands, drier farmlands with well-treed paddocks, Callitris and Casuarina country.	Possible. At north-eastern end of range.
<i>Neophema pulchella</i>	Turquoise Parrot	R	-	Woodland and open grassland, natural or partially cleared.	Possible. At northern end of range.
<i>Merops ornatus</i>	Rainbow Bee-eater	-	M	Open country of woodlands, open forest, semi-arid scrub, grasslands, clearings in heavier forests and farmlands.	Probably move through on annual migration
<i>Nettapus coromandelianus</i>	Cotton Pygmy-Goose	R	M	Deeper freshwater swamps, lagoons, dams.	Possible intermittent occurrence at dams
<i>Neochima ruficauda ruficauda</i>	Star Finch	E	E	Swamp vegetation, open grassland with sparse vegetation, cultivated land.	Unlikely due to lack of suitable habitat.
<i>Rostratula australis</i>	Australian Painted Snipe	-	V	Well vegetated shallows and margins of wetlands and other water courses.	Unlikely due to lack of suitable habitat.
<i>Rostratula benghalensis</i>	Painted Snipe	V	V/M	Surrounds and shallows of wetlands that are well vegetated with dense low cover.	Unlikely due to lack of suitable habitat.
Mammals					
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	R	V	Caves and mines in dry sclerophyll forests and woodlands as well as higher altitude moist eucalypt forest and edges of rainforest.	Unlikely due to lack of suitable habitat.
<i>Dasyurus hallucatus</i>	Northern Quoll	-	E	Variety of vegetation types, but particularly in rocky eucalypt woodlands and near creeks.	Unlikely due to lack of suitable habitat.
<i>Nyctophilus timoriensis</i> (South-eastern form)	Eastern Long-eared Bat	V	V	A range of dry woodland and shrubland communities, roosts mainly in tree hollows, forages low amongst the canopy and shrub layers.	Unlikely due to lack of suitable habitat.
Ray-finned fishes					
<i>Maccullochella peelii peelii</i>	Murray Cod	-	V	Prefers deep holes with abundant snags in slow-moving rivers	Unlikely due to lack of suitable habitat.

(Source: Wildlife Online (EPA) & EPBC Database (DEWHA))

E = Endangered V = Vulnerable R= Rare NT= Near Threatened M = Migratory

10.2.2.4 Introduced Fauna

Three introduced fauna species, Fox (*Vulpes vulpes*), Feral Pigeon (*Columba livia*) and Brown Hare (*Lepus europaeus*), were identified on the site during the site assessment. Domestic Goats (*Capra hircus*) from the adjoining property were also grazing on the grassland in Vegetation Community 4. It is highly likely that several other species inhabit the site including Pig (*Sus scrofa*), Cane Toad (*Rhinella marina*), Indian Mynah (*Sturnus tristis*) and Cat (*Felix catus*). These species may impact upon local native fauna through predation and competition for resources.

10.3 POTENTIAL IMPACTS

10.3.1 Construction Impacts

The construction of the substation may result in impacts to the ecosystems occurring on the site. These are largely associated with the clearing of native vegetation. Although the proposed location of the substation incorporates disturbed areas such as Vegetation Communities 2 and 4, approximately 40 ha of Vegetation Community 1 will also be cleared. While this represents a considerable loss of this vegetation type for the Project site, the more intact areas of Vegetation Community 1 are outside of the substation footprint and are therefore not required to be cleared.

The loss of this vegetation will also reduce the available habitat for native fauna on the site. This includes mature Eucalypts that provide habitat and food resources for many of the native birds identified on the site. The substation footprint will also require the filling of one of the farm dams on the site that provides habitat and a watering point for local native fauna.

The loss of native vegetation cover and disturbances to soil also increases the opportunities for weed species to invade the site and encroach into surrounding bushland. Machinery and vehicles may also import weed species on to the site during site construction activities. Environmental weeds may compromise the condition and integrity of surrounding bushland if not managed appropriately.

Vegetation clearing and construction traffic may injure fauna during site construction activities. In particular, less mobile and nocturnal species are highly susceptible during construction as they may lack the opportunity to migrate to safe habitats.

10.3.2 Operational Impacts

Impacts during the operation of the substation are largely associated with vehicle traffic to the substation site as well as potential hazards that the substation may provide to surrounding vegetation such as fire and contamination from pollutants.

Vehicles provide a potential source of road kill and fauna injuries, particularly when traffic is likely to be higher.

The substation may provide a potential fire source to surrounding vegetation. The onset of a bushfire could result in fauna mortalities as well as loss and degradation of habitat. Limited chemical will be used in the operation of the substation however in the event of a chemical spill, chemical may degrade surrounding habitats and intoxicate native fauna.

10.3.3 Impacts on Threatened Communities

No threatened communities occur on the site. There is potential for threatened communities to occur within the surrounding area however impacts on these communities as a result of the Substation development are unlikely.

10.3.4 Impacts on Regional Ecosystems

The proposed substation will require the clearing of remnant vegetation occurring on the site. This will result in the loss of approximately 30.5 ha of mapped 'not of concern' Regional Ecosystems 11.5.1 (*Eucalyptus crebra*, *Callitris glaucophylla*, *Angophora leiocarpa*, *Allocasuarina luehmannii* woodland on Cainozoic sand plains/remnant surfaces) and 11.5.1a (*Eucalyptus populnea* woodland with *Allocasuarina luehmannii* low tree layer) that are associated with Vegetation Communities 1, 2 and 3.

10.3.5 Impacts on Threatened Flora and Fauna

No threatened flora or fauna species were identified on the site during the site assessment. However, it is possible that threatened fauna may occur on the site periodically and may therefore be impacted, especially if they are present on the site during construction. The removal of potential suitable habitat (*Eucalyptus* woodlands, open forests and plantations) for threatened species such as the Square-tailed Kite and Swift Parrot will occur as part of this substation development and this has the potential to impact on such species using the site.

Although not recorded on the site despite targeted searches, the proposed substation will result in the loss of potential habitat for the vulnerable (NCA and EPBC) *Philotheca sporadica*. *Philotheca sporadica* is known to occur where soils are shallow, uniform sandy loam to clay loams of extremely low fertility and poor condition. It primarily occurs in low open forests of Queensland peppermint (*Eucalyptus exserta*), Narrow-leaved Ironbark (*E. crebra*), Red Ironbark (*E. fibrosa*), and Cypress Pine (*Callitris glaucophylla*) (Halford 1995). Native flora which has also been identified in association with *P. sporadica*, includes: Rusty Gum (*Angophora leiocarpa*), Yellow Jacket (*Corymbia watsoniana*), (*Eucalyptus exserta*), Blue-leaved Ironbark (*E. fibrosa* subsp. *nubila*), Burrows Wattle (*Acacia burrowii*), Crowded-leaf Wattle (*A. conderta*), Sticky Hop Bush (*Dodonaea viscosa*), Barbwire Grass (*Cymbopogon refractus*) and Lomandra (*Lomandra longifolia*) (Kanowski 2005; Halford 1995). There is habitat at the proposed substation location which is consistent with this description and therefore the species may occur on the site. Targeted searches have revealed that no significant populations of the species occur within the Project site, however there is potential for individuals to occur on the site.

10.3.6 Impacts on Migratory Species

The substation will result in the loss of potential habitat for several migratory species, namely Cattle Egret and Rainbow Bee-eater. However the site is not considered to provide important habitat for either species. It is also possible that White-throated Needletail and Fork-tailed Swift (*Apis pacificus*) may occasionally fly-over the site but they are unlikely to be impacted through the presence of the substation.

10.3.7 Impacts on Habitat Corridors

Much of the surrounding areas have been impacted through mining, the Kogan Creek Power Station, agricultural and grazing land management that has cleared large tracts of bushland. Therefore the site does not form part of any significant ecological corridor. However it does contribute to some local corridor running north-south and east-west. As there is relatively intact vegetation cover across areas of the Project site which will not be cleared for the substation, the proposed Project will not have a significant impact on regionally significant habitat corridors.

10.4 MITIGATION MEASURES

10.4.1 Construction Impacts

A number of mitigation measures are recommended in order to reduce the potential impacts upon native flora and fauna on and around the site. Construction activities should be restricted to between 6.30am and 6.30pm. No barbed-wire or electric fencing should be used during the construction as these may harm fauna. A Vegetation Management Plan (VMP) should be prepared for the site to address the clearing and protection of vegetation on the site.

Vegetation clearing should be undertaken in a manner that reduces potential injuries and mortalities to fauna. It is recommended that Areas to be cleared should be surveyed by a spotter catcher or ecologist within 24 hours prior to clearing to identify habitat trees that could be occupied by fauna. These trees should be clearly marked and retained during the clearing phase until fauna has had the opportunity to move into nearby habitat on their own accord. Clearing should also be undertaken in the presence of a fauna spotter/catcher.

Areas of vegetation to be retained should be protected by erecting temporary fencing to prevent access by machinery and construction crews. No stockpiling of material or dumping of construction waste should be permitted in these areas.

All vehicles should be free of weeds prior to entering and exiting the site to prevent the spread of weed species. Washdown facilities should be provided and frequent inspections should be undertaken by suitably qualified staff.

Appropriate traffic management should be implemented during site construction. All vehicles, except in the event of an emergency, should be restricted to designated access tracks with a maximum speed limit of 40km/hr. Signs should be erected to notify of speed limits and the potential presence of wildlife.

A bushfire setback area should surround the substation site. This area should be free of flammable material including native trees and shrubs. A Bushfire Management Plan should be prepared for the site to identify management actions to reduce the bushfire hazard as well as emergency procedures.

All chemicals should be stored in appropriately bunded areas and used in accordance with the relevant MSDS and management plans.

All works are to be undertaken in accordance with the EMP (see Appendix E).

10.4.2 Operational Impacts

All vehicles should be free of weeds prior to entering and exiting the site to prevent the spread of weed species. Existing weed infestation should be treated in accordance with a VMP prepared for the site.

Appropriate traffic management should be implemented during the operation of the substation. All vehicles should be restricted to designated access tracks with a maximum speed limit of 40km/hr (except in the event of an emergency). Signs should be erected to notify of speed limits and the potential presence of wildlife.

A bushfire setback needs to be provided around the substation site in accordance with *State Planning Policy 1/03 Guideline*. It should be noted that in the wake of the recent bad bushfire seasons, the requirements of Australian Standard 3959 - 2009 Building in Bushfire Prone Areas have been upgraded and are increasingly enforced in areas where bushfire risk is evident. As of the 1st October 2009, Queensland has adopted these revised Australian Standards (AS 3959:2009) for Building in Bushfire Prone Areas. The adoption of the standard will necessitate amendment of the Building Code of Australia (as of the 1st May 2010), the Queensland Development Code (amendment date of legislation unknown) and the State Planning Policy (1/03) – Mitigating the impacts of floods, bushfire & landside (SPP). The exact implications for the codes, policies and planning scheme however have not been determined at this time. The bushfire setback provided on site should be free of flammable material including native trees and shrubs. A Bushfire Management Plan should be prepared for the site to identify management actions to reduce the bushfire hazard as well as emergency procedures.

All chemicals should be stored in appropriately bunded areas and used in accordance with the relevant MSDS and management plans.

Lighting from the substation should be designed to reduce light spillage in to surrounding vegetation.

All works are to be undertaken in accordance with the EMP (see Appendix E).

10.4.3 Habitat Rehabilitation

Rehabilitation of disturbed areas (Vegetation Communities 2, 4 and 5) that are outside of the substation footprint can offset the loss of native vegetation. Rehabilitation should aim to allow natural revegetation which will return the disturbed areas to a similar condition to that seen prior to disturbance. A Rehabilitation Management Plan should be prepared and include details of treatments (revegetation, weed control and monitoring) for these areas.

11.0 LAND USE & PLANNING

11.1 INTEGRATED PLANNING ACT 1997

The *Integrated Planning Act 1997* (IPA) allows for two planning processes to be used to facilitate the proposed development. The following section provides an overview of each planning process, being:

- Integrated Development Assessment System (IDAS); and
- Ministerial Designation Process.

11.1.1 IDAS

The Integrated Development Assessment System (IDAS) outlined in Chapter 3 of the *Integrated Planning Act 1997* provides a clear description of the Development Application Process to be used by Local Government in the assessment of Development Applications. If the project were to proceed under IDAS, it would trigger Impact Assessment. Therefore the Local Authority under Section 3.5.5 of the *Integrated Planning Act 1997* would undertake the assessment, having regard to the following:

- a. *the common material;*
- b. *the Planning Scheme and any other relevant local planning instruments;*
- c. *if they are not identified in the Planning Scheme as being appropriately reflected in the Planning Scheme –*
 - (i) *State planning policies, or parts of State planning policies; and*
 - (ii) *for the Planning Scheme of a local government in the relevant are of a State planning regulatory provision – the provision; and*
 - (iii) *for the Planning Scheme of a local government in a designated region – the region's regional plan;*
- d. *any development approval for, and any lawful use of, premises the subject of the application or adjacent premises;*
- e. *if the assessment manager is not a local government – the laws that are administered by, and the policies that are reasonable identifiable as policies applied by, the assessment manager and that are relevant to the application;*
- f. *the matters prescribed under a regulation (to the extent they apply to a particular proposal).*

The Integrated Development Assessment System provides a four (4) stage process. Accordingly as all Development Application have different requirements and levels of complexity, not all stages of the Integrated Development Assessment System or steps within each stage are applicable to all applications.

- Stage 1 – Application Stage;
- Stage 2 – Information and Referral;
- Stage 3 – Notification; and
- Stage 4 – Decision.

As the project would be Impact Assessable under IDAS, any submitters who make a properly made submission during the Notification Stage obtain appeal rights and have the ability to appeal the decision in the Planning and Environment Court.

Type of Proposed Development

The project is defined as a Material Change of Use under Section 1.3.5 of the *Integrated Planning Act 1997*, which is defined as:

- a. *generally –*
 - (i) *the start of a new use of the premises; or*
 - (ii) *the re – establishment on the premises of a use that has been abandoned; or*
 - (iii) *a material change in the intensity or scale of the use of the premises; or*
- b. *for administering IDAS under the Environmental Protection Act 1994 for environmentally relevant activities (other than for a mining activity, a chapter 5A activity or a mobile and temporary environmentally relevant activity) –*
 - (i) *the start of a new environmentally relevant activity on the premises; or*
 - (ii) *an increase in the threshold of an environmentally relevant activity on the premises; or*
 - (iii) *the re – establishment on the premises of an environmentally relevant activity that has been abandoned; or*
 - (iv) *a material change in the intensity or scale of an environmentally relevant activity on the premises.*

11.1.2 Ministerial Designation

Section 2.6 of the *Integrated Planning Act 1997* provides a clear description of the process required for a Ministerial Designation. The purpose of this EIS is to identify and outlined matters to be considered by the Minister for Natural Resources, Mines and Energy and Minister for Trade.

Matters to be considered

Section 2.6.7(1) and 2.6.7(2) of the IPA outline the matters which should be considered, as follows:

2.6.7(1)	<i>Before designating land, the Minister must be satisfied that, for the development, the subject of the proposed designation –</i>
a.	<i>adequate environmental assessment has been carried out; and</i>
b.	<i>in carrying out environmental assessment under paragraph (a), there was adequate public consultation; and</i>
c.	<i>adequate account has been taken of issues raised during the public consultation; and</i>
d.	<i>for land to which section 2.6.5A applies – adequate account has been taken of the approved development scheme mentioned in that section.</i>
2.6.7(2)	<i>The Minister must also consider –</i>
a.	<i>every properly made submission under (4); and</i>
b.	<i>each relevant State planning policy; and</i>
c.	<i>for land in a designated region – the region's regional plan; and</i>
d.	<i>for land in a relevant area for a State planning regulatory provision – the provision; and</i>
e.	<i>for land in a declared master planned area – and master plans for the area;</i>
f.	<i>and each relevant Planning Scheme.</i>

An assessment of the proposed development against Section 2.6.7(1) of the IPA has been provided within the EIS. An assessment of the proposed development against Section 2.6.7(2) of the IPA has been provided within this document and is summarised below:

Properly made submissions under Section 2.6.7(4)

The project has not reached this stage in the process. Upon submission of the request for community designation, a written notice of the project will be provided to the owner of land to which the proposed designation applies and the Western Downs Regional Council.

State Planning Policies

An assessment of all relevant SPP's is provided in Section 11.6 of this report.

Regional Plan

An assessment of all relevant Regional Plans is provided in Section 11.5 below.

State Planning Regulatory Provision

The site is not located within a State Development Area and as such is not subject to a State Planning Regulatory Provision.

Master Plans

The site is not within a declared master planned area.

Planning Scheme Provisions

An assessment of all relevant Planning Scheme Provisions is provided in Section 11.2 below.

Type of Proposed Community Infrastructure

The use of the subject site for an electrical substation is defined as Community Infrastructure under Schedule 5 of the *Integrated Planning Act 1997*, and as operation works under the Electricity Act 1994, which are defined as:

- | |
|---|
| <ul style="list-style-type: none"> a. <i>for a generation entity – the generating plant, fuel stocks, electrical and other property used for generating electricity or connecting supply to a transmission grid or supply networks; or</i> b. <i>for a transmission entity – the transmission grid and other property used for operating or managing the transmission grid; or</i> c. <i>for a distribution entity – the supply network and other property used for operating and managing the supply network.</i> |
|---|

Powerlink Queensland is considered to be transmission entity. According the provision of a 275kV/500kV Substation and associated works are considered to be Operation Works, and is Community Infrastructure under Schedule 5 of the *Integrated Planning Act 1997*.

11.1.3 Reasons for Proposed Designation

The provision of a 275/500kV Electrical Substation is considered to satisfy the designation provision described in Section 2.6.2 of the *Integrated Planning Act 1997*, where land may be designated for Community Infrastructure only if the designator is satisfied the Community Infrastructure will:

- | |
|--|
| <ul style="list-style-type: none"> a. <i>facilitate the implementation of legislation and policies about environmental protection or ecological sustainability; or</i> b. <i>facilitate the efficient allocation of resources; or</i> c. <i>satisfy statutory requirements or budgetary commitments of the State or local government for the supply of community infrastructure; or</i> d. <i>satisfy the community's expectation for the efficient and timely supply of the infrastructure.</i> |
|--|

The proposed substation is considered Community Infrastructure that would satisfy item (d) above, as Powerlink Queensland have identified the need to construct a new substation to provide a more reliable electricity supply throughout Southern Queensland.

The test for qualification under Section 2.6.2 of the *Integrated Planning Act 1997* is to ensure that designated Community Infrastructure is planned and justified in terms of being beneficial to the public. For the benefit of public accountability, the consideration of the matters under Section 2.6.2 of the *Integrated Planning Act* should be a deliberative and recorded action. Table 11.1 at the end of this section provides a summary of Town Planning requirements.

11.1.4 Comparison of Planning Processes

The primary area of difference between the Ministerial Designation Process and the Integrated Development Assessment System Process is that the proposed substation is not subject to the provisions of the Planning Scheme for the former Chinchilla Shire as part of the Ministerial Designation.

The Ministerial Designation Process allows for the assessment of the development without the requirements associated with the preparation, lodgement and management of a Development Application under the IDAS process.

The Ministerial Designation Process is preferred as it would streamline the planning process enabling the timely commencement of infrastructure that will meet the growing demand and demonstrated need within the Western Downs Region.

Furthermore, as a function performed under the *Integrated Planning Act 1997*, the proposed designation is still required to complete a through assessment against the Planning Scheme provisions, including public notification prior to designated by the Minister, as well as manage the effect of the development on the environment during the process.

11.2 EXISTING ENVIRONMENT

11.2.1 Current Landuse

The site has historically been predominantly used as a grazing enterprise with a small date plantation also present near the existing house. All grazing stock are currently removed from the site. Apart from the existing house, the study site also has four farm dams and remnants of an irrigation system at the date palm plantation. Boundary fences are also in place.

11.2.2 Planning Scheme

The study area is located within the municipal boundaries of Western Downs Regional Council. On 15th March 2008, Western Downs Regional Council was formed with the amalgamation of Wambo, Dalby Town, Chinchilla, Murilla, Tara and Taroom Shire.

Prior to the amalgamation the study area was situated within Chinchilla Shire. The study area is subject to the *Chinchilla Shire Planning Scheme* ("the Planning Scheme"). The *Chinchilla Shire Planning Scheme* is an IPA compliant Planning Scheme.

Overview / Structure

The *Chinchilla Shire Planning Scheme* is similar in structure to the majority of Planning Schemes prepared under the IPA. The Chinchilla Shire Planning Scheme is structured in the following manner:

1. Strategic Designation ;
2. Zones;
3. Zone Codes; and
4. Planning Scheme Policies.

This section of the report outlines the processes of the Chinchilla Shire Planning Scheme and other mechanisms that are useful in Planning Scheme interpretation.

Use Definition

The *Chinchilla Shire Planning Scheme* provides a number of definitions to provide an explanation of the meaning of terms used in the scheme and for use to assist the community in understanding development proposals. The definitions are contained in Part 2 the Planning Scheme.

The proposed substation would be defined as a “*Public Utility*”, which is:

Public Utility - means “premises” used for a waste landfill site, the supply of water, hydraulic power, electricity or gas, or provision of telephone, sewerage, postal or drainage services or the provision or maintenance of roads or traffic controls or railways or railway corridors.

Level of Assessment

Section 4.1.2 of the *Chinchilla Shire Planning Scheme* nominates the level of assessment for uses established in the Rural Zone. In accordance with Section 4.1.2 of the Planning Scheme, a “Public Utility” is “Code Assessable” development.

Strategic Designation

Part 3 of the Planning Scheme outlines the Strategic Direction for the former Chinchilla Shire Council area and is summarised into 3 Desired Environmental Outcomes (DEO), being:

1. The Natural Environment;
2. Economic Development; and
3. Community and Services.

Natural Environment

In Chinchilla Shire, ecological systems (including the Condamine River, its tributaries and floodplain) and the natural environment, items and places of cultural heritage significance are protected and enhanced by development:

- *Development is managed to minimise the adverse impacts on air and water quality, to prevent land degradation, loss of habitat and biodiversity and to protect riparian areas.*
- *Significant areas (including the condamine river) and areas and items of cultural significance (including areas along water courses) are identified to ensure their environmental and landscape values and historic significance are protected and enhanced through compatible development.*

As demonstrated throughout this report, consideration has been given to the proposal and the potential for impacts upon the study area. It is acknowledged the study area has previously been used for grazing purposes and has been disturbed as a result of this and other agricultural activities.

Given the project will establish a substation on the site, it is anticipated the project is unlikely to have a significant impact upon air and water quality (see Sections 6 and 7). From a vegetation perspective, it is proposed to retain as much of the existing vegetation as possible (see Section 10). The site is also isolated from any riparian corridors and therefore no mitigation measures are required in this regard.

Consideration has also been given to the potential cultural heritage values of the study area. As outlined in Sections 17 and 18 of this report, no non-indigenous cultural heritage values have been identified for the site.

Based on the above, the project will not compromise the associated Natural Environment DEO through the endeavours to minimise the potential impacts of the proposal on the natural environment of the study area.

Economic Development

The economy of Chinchilla Shire is enhanced and diversified through sustainable use of natural resources (including soil, extractive and mineral resources) and through a diverse range of other economic activities that respect the hierarchy of the urban centre and the small towns:

- *The planning scheme reinforces and consolidates the role of Chinchilla as the principal place for business, industry and commerce within the shire.*
- *The local service roles of the towns of Brigalow and Kogan are protected and enhanced.*
- *Productive rural land (such as the Condamine floodplain), rural industries and natural features (including mineral and extractive resources) are protected to reflect and enhance their continued economic potential and viability.*
- *The industrial areas in chinchilla are consolidated and protected to ensure their role as the key areas for industrial activity is reinforced.*

The emphasis of this DEO is to promote economic diversity, particularly through the sustainable use of the natural resources of the former Chinchilla Shire. In promoting economic diversification, the existing townships are not to be adversely affected.

The project is considered to satisfy this DEO on the basis the development:

- Is for a substation and will not affect the role of Chinchilla as a principal place of business;
- The proposal will not affect the role of Brigalow and Kogan as townships. These townships are anticipated to benefit from the employment generated from the construction and ongoing management/maintenance of the substation; and
- The substation will occupy land previously used for agricultural purposes, but is required to meet the ongoing and increasing demand for electricity in the network. The project is unlikely to effect the continuation of agricultural activities on adjoining land.

Community and Services

Development in Chinchilla Shire reflects community expectations and needs, and contributes to community well-being through enhancement of core community elements (including the built environment, services, facilities and infrastructure):

- *The settlement pattern is logical and sequenced and the built environment contributes to the overall rural amenity and character of chinchilla shire.*
- *People are connected to public spaces (including recreational areas) and community services through an appropriate land use structure and the provision of infrastructure, particularly within the urban centre and small towns of the shire.*

- *Development contributes to the health and safety of people and provides a diverse range of housing types, services and facilities.*
- *Infrastructure (including water, sewerage and roads) reflects community expectations and needs, achieves engineering and environmental standards and is provided in an orderly and logical sequence to ensure cost effectiveness.*

The proposal satisfies the DEO with respect to the provision of infrastructure to meet the needs and the expectation of the community. As discussed within this report, the provision of this substation will be established so as to meet engineering standards and minimise the potential for environmental impact. The balance of the matters raised in the DEO is not applicable to this project.

Zoning – Rural Zone

Under the *Chinchilla Shire Planning Scheme*, land is allocated a specific zone in order to identify the predominant, preferred or existing land uses for that area. Each respective zone has a Planning Scheme Code associated with it to govern and influence development. The proposed study area is located within the *Rural Zone* of the *Chinchilla Shire Planning Scheme* and any proposed development within this zone is to comply with the provisions of the *Rural Zone Code*.

In accordance with section 4.1.3.3 of the Planning Scheme the intent of the *Rural Zone* is as follows:

within the Rural Zone, “development”:

- (a) *Maintains the environment, including soil, air and water, compatible with healthy natural systems and ensures public health and safety;*
- (b) *Protects good quality agricultural land (GQAL) from fragmentation, alienation or encroachment of incompatible land “uses” in accordance with state planning policy 1/92 – development and conservation of agricultural land;*
- (c) *Is located, designed and operated in a manner that protects and enhances the predominant rural scale, intensity, form and character;*
- (d) *Maintains the rural amenity;*
- (e) *Does not prejudice or impact adversely on other “uses” including those within other “zones”;*
- (f) *Does not prejudice extractive or mining resources;*
- (g) *Has an appropriately designed access to the road network, and traffic generated by the development does not impact adversely on the local road network;*
- (h) *Protects areas and sites of conservation importance, including cultural and high landscape values;*
- (i) *Is undertaken in an orderly and logical sequence to achieve an efficient provision of infrastructure;*
- (j) *Maintains the integrity of the condamine flood plain;*

- (k) *Is located and designed in ways that minimise the need for flood, bushfire and landslide mitigation, and to protect people and premises from such natural events;*
- (l) *Has water supply, stormwater disposal, sustainable effluent and waste disposal and power, to appropriate standards, adequate for the “use”; and*
- (m) *Does not impact adversely on infrastructure.*

The intent for development within the *Rural Zone* does not directly contemplate the establishment of substations or public utilities in this zone. Ultimately, development that occurs within the *Rural Zone* is to ensure the continued maintenance of a high level of amenity through the protection of environmental processes. It is important to note that:

- The project has been located and designed to minimise the environmental impact in accordance with Australian Standards;
- The site is not mapped by Council as Good Quality Agricultural Land (see Section 5.3.1.6 and Figure 5.3);
- The project will be limited to the Project site and is not anticipated to alienate agricultural uses from the adjoining allotments; and
- The project will minimise the potential for impacts upon the ecological values of the site and immediately surrounding area.

The proposal represents a sequential expansion of the existing Kogan Power Station in order to meet the future electricity demands on the network. In this regard, the proposal is considered to satisfy the provision that development in the *Rural Zone* will not adversely impact upon infrastructure and thus limit the potential for the expansion of existing electricity infrastructure.

Development Provisions – Rural Zone Code

The *Rural Zone Code* is used to assess all development that occurs within the *Rural Zone* (Figure 11.1). In this instance, the project would be subject to assessment against the provisions of this code. The *Rural Zone Code* is structured with Performance Criteria and Acceptable Solutions in which to assess development.

The Acceptable Solutions within the Planning Scheme identify one solution to the relevant Performance Criteria. Where a proposal does not accord with the Acceptable Solution, the proposal will need to demonstrate it satisfies the Performance Criteria.

Within the *Rural Zone*, the Code allows for:

- (a) Tourist related “uses” (“bed and breakfast premises” and “visitor accommodation”) and “home businesses” where they are of a small scale and are compatible with surrounding “uses”;
- (b) The protection of existing “intensive animal industries” and “extractive industries” from incompatible “uses”;
- (c) “Intensive animal industries” and “extractive industries”, where located and operated so as to ensure no detrimental impact on surrounding “uses” or on the environment; and
- (d) Limited industrial “uses”, where it can be demonstrated those “uses” are associated with rural production and can not reasonably be established in the industrial “zone”.

The *Rural Zone Code* remains relatively silent on establishing a *Public Utility* within the *Rural Zone*. However, it does not preclude the operation of such infrastructure. It is noted the code provides specific criteria for uses that are considered to be “non-rural activities”, being activities that do not involve agriculture, grazing, intensive agriculture and intensive animal husbandry.

In this instance, the proposal is inconsistent with these two provisions of the code, being:

PC2 Non-“Rural activities” - scale Non-“rural activities” are of an appropriate scale to protect the amenity of the rural “zone” and do not prejudice the operation and viability of other “uses” or activities in the rural “zone” or other “zones”.	AS2 The “total use area” is less than 150m² on a lot.
PC3 Non-“rural activities” - operating hours Non-“rural activities” are operated so as to ensure that the activities and the operation of equipment occur at appropriate times to protect the amenity of the rural “zone”.	AS3 non-“rural activities” are operated only between the hours of 7:00am and 6:00pm.

In both instances, it would be unreasonable for the proposal to comply with these requirements as the size of the development is dictated by the extent to which the network needs to be supported to satisfy energy demands. In addition, it cannot be expected that the substation would operate on a 7am to 6pm timeframe.

Therefore regard is given to the relevant Performance Criteria. In the first instance, the proposed substation will be contained within the land set aside for the infrastructure. The substation will also be located within the Project site to ensure it is suitably setback from the property boundaries. Therefore the project is capable of satisfying the Performance Criteria above. Through appropriate mitigation measures the proposed substation can be implemented in a manner that has minimal impact on the amenity of the existing locality whilst not jeopardising surrounding land activities.

11.2.3 Planning Scheme - Local Plan

The Planning Scheme does not contain any Local Plan. This matter is not relevant to the assessment.

11.2.4 Good Quality Agricultural Land

Good Quality Agricultural Land (GQAL) has been mapped by the former Chinchilla Shire Council and is illustrated on Planning Scheme Sheet 3 of 7 (see Figure 5.3). The mapping identifies Class A and Class B Good Quality Agricultural Land.

The study area is not mapped and is therefore considered to not constitute Good Quality Agricultural Land.

11.2.5 Future land use

As outlined above, the study area is included in the *Rural Zone* and as such is intended to accommodate rural activities such as agriculture, horticulture and grazing. In supporting the proposed substation, the site will no longer be able to accommodate rural land uses.

The desktop assessment of mapped and known site constraints is provided. The assessment of the site is based on the following site constraints:

- Regional Ecosystem & Essential Habitat Map (DERM);
- Chinchilla Shire Council's Good Quality Agricultural Land mapping (Figure 5.3);
- Chinchilla Shire Council's Land Characteristics Map _ Features Map 1 (Figure 11.2);
- Chinchilla Shire Council's Land Characteristics Map – Features Map 2 (Figure 11.3) and
- Chinchilla Shire Council's Ground Water Vulnerability Mapping (Figure 11.4).

Based on the constraints assessment, an assessment of Planning Scheme intents and requirements and the current services on the site, potential site specific and cumulative impacts of the project (from a Planning Scheme perspective) on existing and potential land uses on the site have been considered. A summary of these findings is provided below:

Grazing and Agriculture (Impact – Limited)

- Observations of current grazing and agricultural process within the locality indicate that there would be marginal impacts to farming practices and productivity, if any;
- Land within the Project site may be capable of accommodating limited grazing production based on historical grazing of the site;
- Good Quality Agricultural Land mapping by Council indicates the site is not considered to be Good Quality Agricultural Land. Therefore the site is not likely to be used for agricultural purposes; and
- Grazing activities have ceased on the land.

Extractive Industry (Impact – Medium)

- The site is mapped as a Mineral Development Licence area;
- The site is not identified as being a Key Resource Area; and
- While a Mineral Development License area is identified for the site, the Planning Scheme is silent on the resource and merely provides a separation distance from the site to any building, structure and outdoor activity.

The intention to develop the site for a public utility is not clearly contemplated by the Planning Scheme. However, the proposal represents a sequential and logical expansion of the existing Kogan Power Station. The infrastructure will also assist with meeting the future energy demands for the network. On this basis, the proposal is considered to not unreasonably prejudice the Strategic Directions provided in the Chinchilla Shire Planning Scheme or the purposes of the *Rural Zone*.

11.3 POTENTIAL IMPACTS

11.3.1 Comparison with Planning Scheme

Provisions of the Rural Zone Code

As outlined above, while there is no specific development provisions that relate to the establishment of a substation, the proposal is unlikely to conflict with the Strategic Directions of the Planning Scheme. Furthermore, the proposal is not considered to compromise the purpose of the *Rural Zone*.

This being said, it is acknowledged that the *Rural Zone Code* does identify Performance Criteria and Acceptable Solutions for land uses that are not Rural Activities – such as the proposed substation.

These provisions state:

PC2 Non-“Rural activities” - scale Non-“rural activities” are of an appropriate scale to protect the amenity of the rural “zone” and do not prejudice the operation and viability of other “uses” or activities in the rural “zone” or other “zones”.	AS2 The “total use area” is less than 150m ² on a lot.
PC3 Non-“rural activities” - operating hours	AS3 non-“rural activities” are operated only between

Non-“rural activities” are operated so as to ensure that the activities and the operation of equipment occur at appropriate times to protect the amenity of the rural “zone”.

the hours of 7:00am and 6:00pm.

The proposal is capable of satisfying the Performance Criterion PC2 given the information available suggests the proposed substation is unlikely to prejudice the ongoing use of the surrounding land for agricultural, grazing or horticultural purposes.

Similarly for Performance Criterion PC3, the key issue is to ensure the substation maintains the amenity of the locality. Given the proposal will be located adjacent to the existing Kogan Power Station, it is reasonable to form the view the proposal will not result in a significant change to the amenity of the existing locality.

Mining/Extractive Resource

The Project site is identified as being within a Mineral Development Lease area on the *Chinchilla Planning Scheme* Features Map 1 (Figure 11.2). It is acknowledged that the Planning Scheme, through its Strategic Directions and purpose for the *Rural Zone* seeks to discourage development that may prejudice mining or extractive resource opportunities. In saying this, Schedule 2 of the Planning Scheme provides a clear separation distance for structures from power transmission line easement. In this instance, a separation distance of 1,000 metres is imposed by the Planning Scheme.

Given the existence of the existing Kogan Creek Power Station, it could be argued that land within 1,000 metres of the power station has been effectively sterilised from mining or extractive resource operations. This separation distance extends onto the study site. It is therefore reasonable to form the view, based upon the desktop assessment undertaken, that the proposal will not further sterilise land included in a Mineral Development Lease area. Consequently, the proposal does not unreasonably compromise the Planning Scheme.

Ground Water

The study area includes land mapped by the *Chinchilla Planning Scheme* as being land subject to Groundwater Vulnerability (refer to Figure 11.4). Consideration of Performance Criteria 36 (PC36) of the *Rural Zone Code* identifies that the purpose of the mapping is to identify land where groundwater contamination is a concern. As such, PC36 states that development is to ensure that “...water quality is maintained...” and “...the natural characteristics of the setting are protected from pollutants and contaminants”.

As outlined above, operational requirements will mean that mitigation measures will be put in place to manage the quality of water that leaves the site and to manage any contaminants that might be spilled on the site. On this basis these mitigation measures are implemented, the project is considered to satisfy the Planning Scheme in this regard.

11.3.2 Changes in Property Value

The proposal will be located on two parcels of land described as Lots 3 & 4 on RP176346 and the anticipated change in the land value, in this instance, is likely to be attributed to the change in the land uses over the site (from agricultural to a Public Utility).

Given the land will be owned by Powerlink, the change in the value of the study site is not relevant.

11.3.3 Disruptions to Neighbouring Areas and Existing Environments

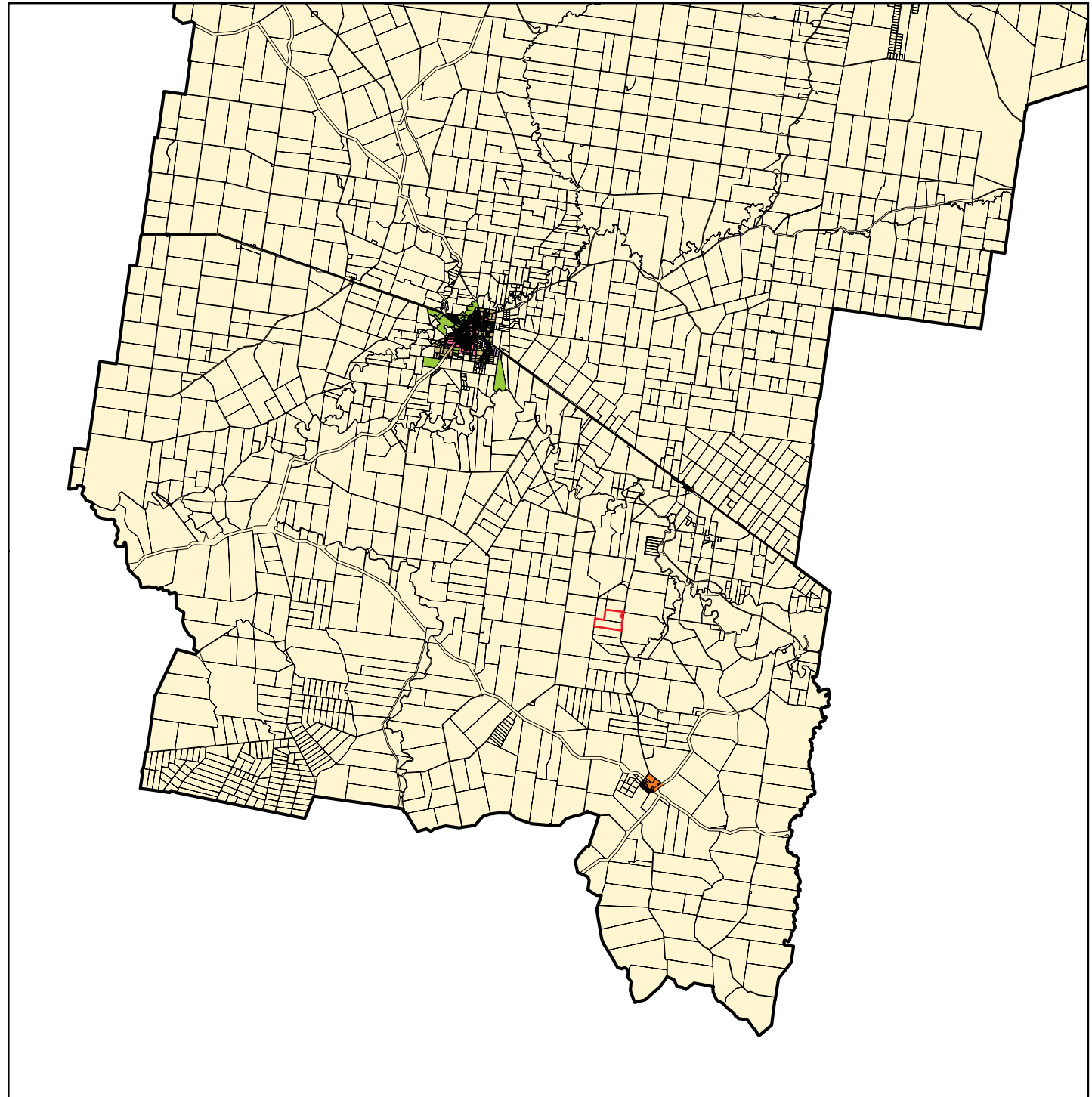
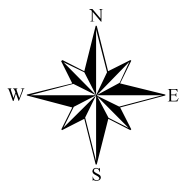
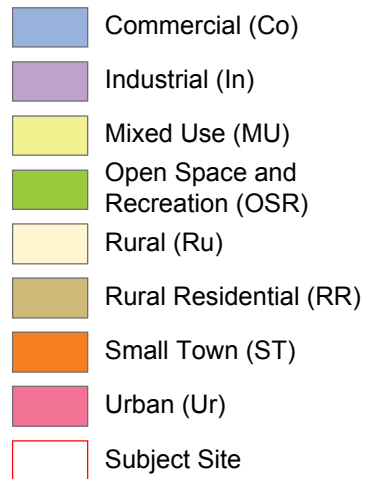
The study site is sparsely vegetated land that has accommodated agricultural (i.e. grazing) activities in the past. There is a house located 400m to the west. The surrounding land is also included in the *Rural Zone* and is attributed the same land uses rights and the study site.

11.4 MITIGATION MEASURES

No mitigation measures are considered to be relevant in this instance.

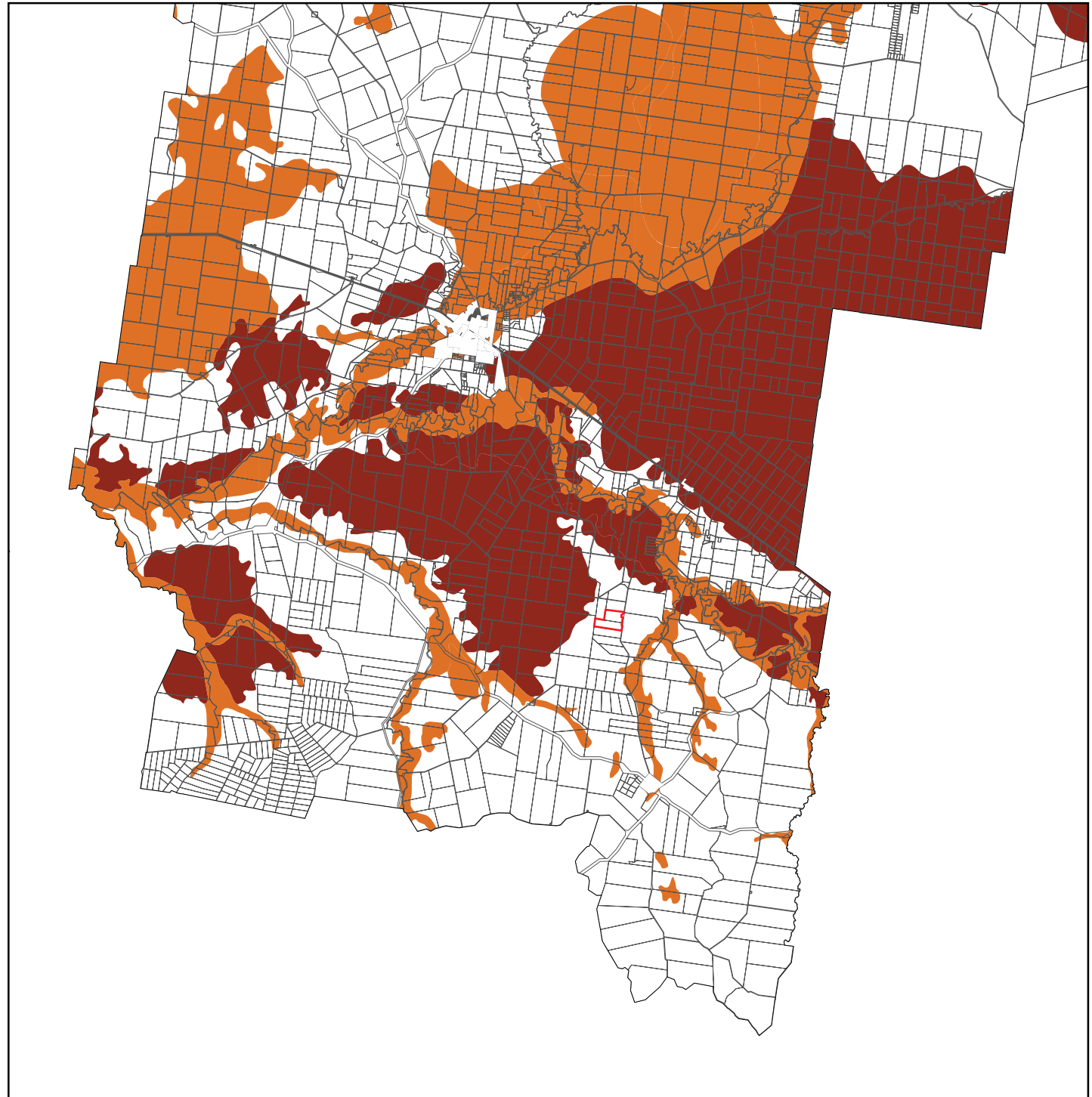
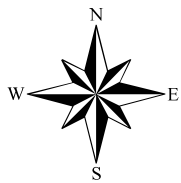
Powerlink
Western Downs EIA
Chinchilla Shire Council
Planning Scheme
Zoning Map

Figure 11.1



Powerlink
Western Downs EIA
Chinchilla Shire Council
Planning Scheme
Zoning Map
Figure 11.2

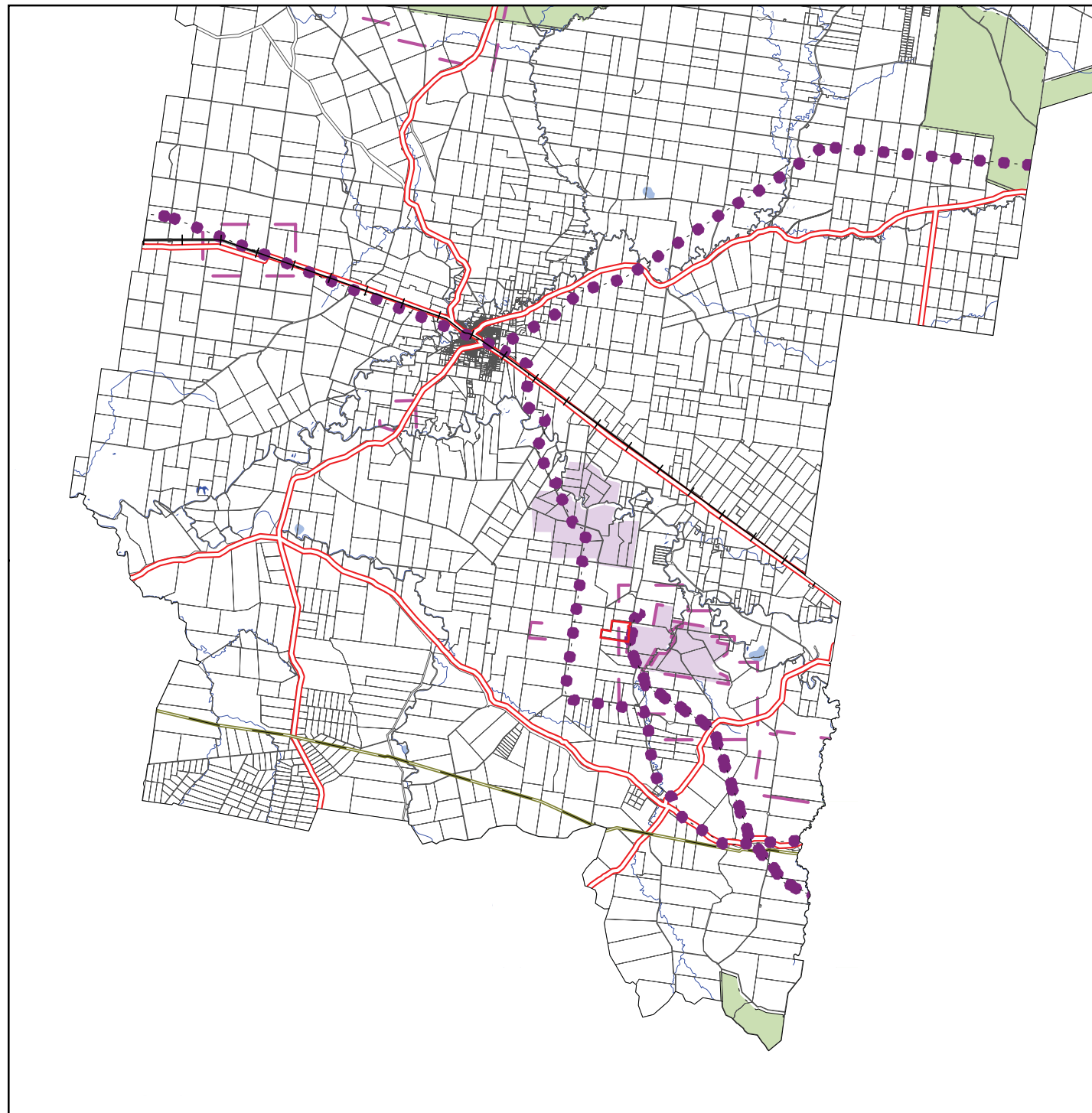
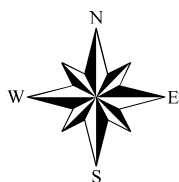
-  Class A
-  Class B
-  Subject Site



Powerlink Western Downs EIA Chinchilla Shire Council Planning Scheme Shire Features

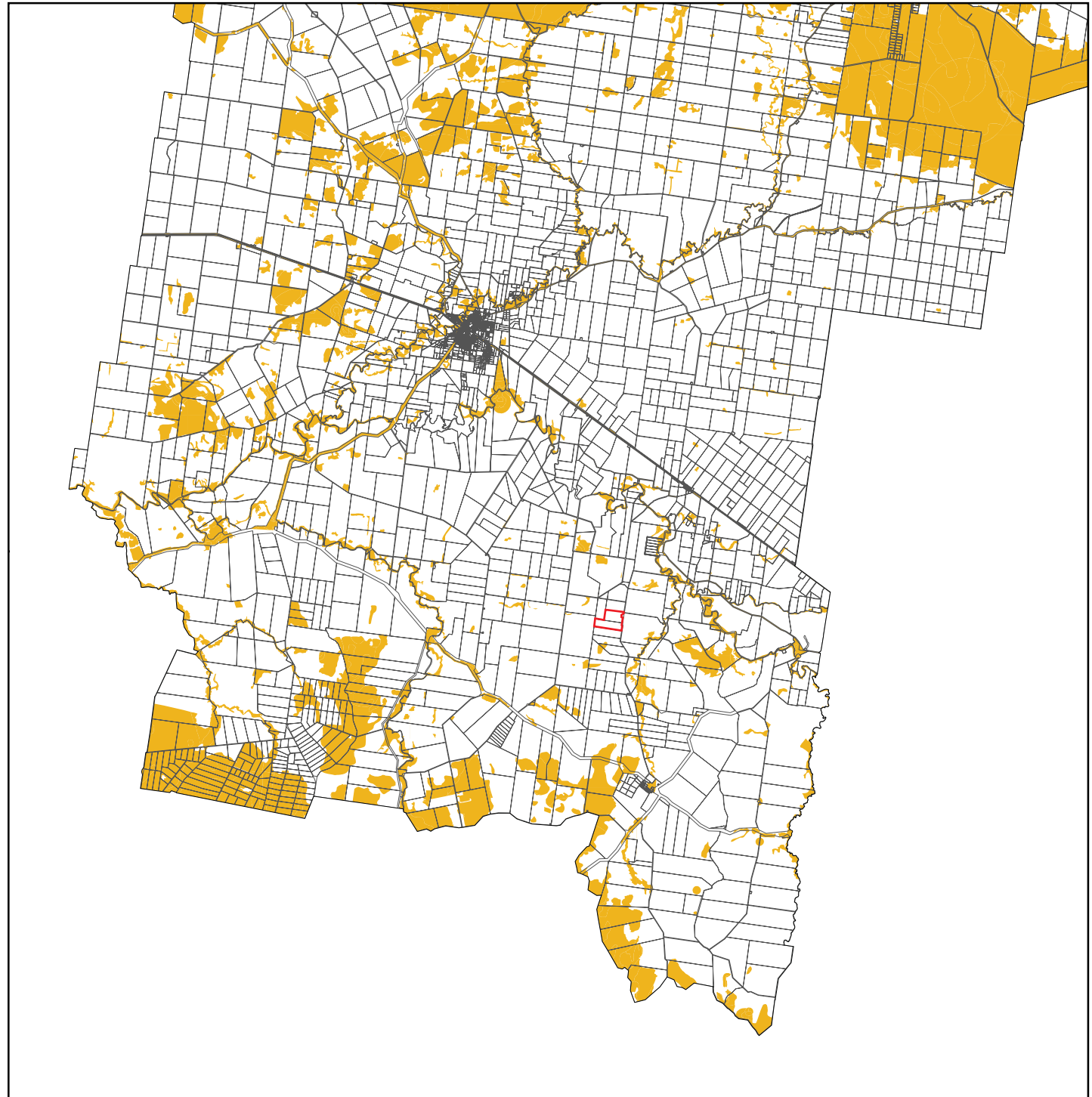
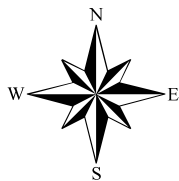
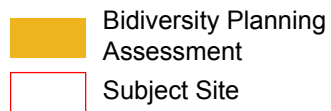
Figure 11.3

-  State Controlled Road
-  Rail Line
-  Watercourse
-  Petroleum & Gas Pipeline
-  High Voltage Electricity Line
-  Mining Lease
-  Mineral Development License
-  State Forest
-  Lake
-  Lake - Submerged to Inundated
-  Subject Site



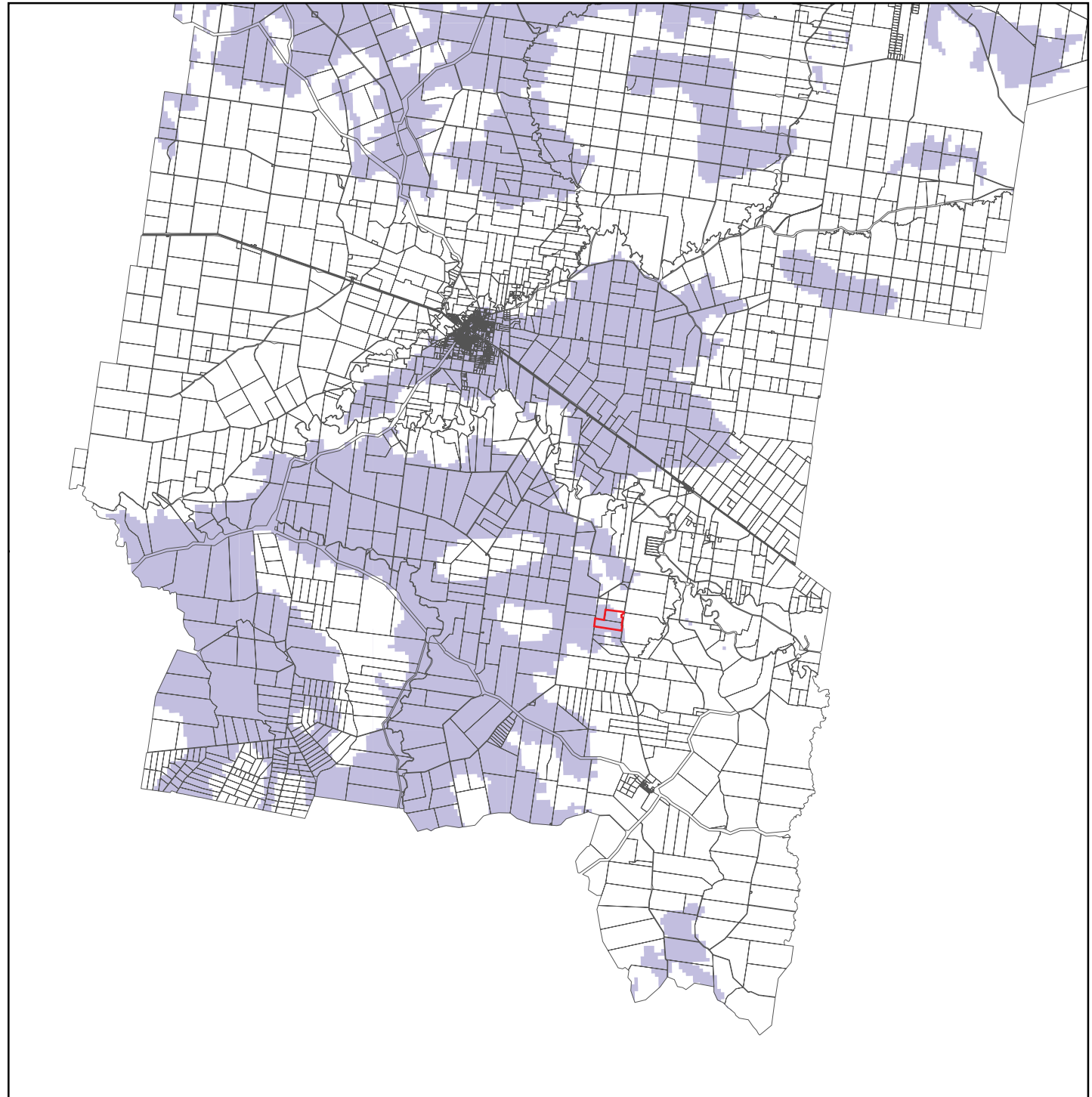
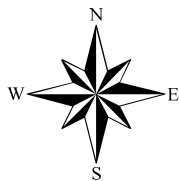
Powerlink
Western Downs EIA
Chinchilla Shire Council
Planning Scheme
Features Map 2

Figure 11.4



Powerlink
Western Downs EIA
Chinchilla Shire Council
Planning Scheme
Ground Water

Figure 11.5



11.5 REGIONAL PLANNING INSTRUMENT

In accordance with Section 2.6.7(2)(d) of the *Integrated Planning Act 1997*, in assessing a request for a ministerial designation for community infrastructure consideration must be given to any Regional Plan that has affect over the subject site.

In this instance, there is no Regional Plan that is applicable to the study site.

11.6 STATE PLANNING SCHEME POLICIES

The following section contains a detailed assessment of the development project against the relevant State Planning Policies for the site as per Section 2.6.7(2)(b) of the *Integrated Planning Act 1997*. Currently seven (7) State Planning Policies (SPP's) are operational within Queensland under the provisions of the *Integrated Planning Act 1997*, being:

- SPP 1/92 Development and the Conservation of Agricultural Land 1.0;
- SPP 1/02 Development in the Vicinity of Certain Airports and Aviation Facilities 1.0;
- SPP 2/02: Planning and Managing Development Involving Acid Sulfate Soils 1.0;
- SPP 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide 1.0;
- SPP 1/07 Housing and Residential Development including Guideline 1.0;
- SPP 2/07 Protection of Extractive Resources and Guideline; and
- State and regional coastal management plans.

Pursuant to Schedule 1, Part 2, Section 18, Subsection (5A) of the *Integrated Planning Act 1997*, the Minister has identified the following SPP's as having been appropriately reflected in the Chinchilla Shire Planning Scheme:

- State Planning Policy 1/92: Development and Conservation of Agricultural Land;
- State Planning Policy 1/02: Development in the Vicinity of Certain Airports and Aviation Facilities; and
- State Planning Policy 1/03 - Mitigating the Adverse Impacts of Flood, Bushfire and Landslide - Bushfire component.

Approval to adopt the Planning Scheme is conditional upon the continued operation and effect of the Integrated Development Assessment System triggers for Department of Transport and Main Roads matters.

As the above SPP's as having been appropriately reflected in the Planning Scheme, compliance with the Planning Scheme ensures compliance with the SPP's. A copy of all State Planning Policy's can be found online at <http://www.dip.qld.gov.au/policies/state-planning-policies.html>.

State Planning Policies not considered applicable to the development of the site are as follows:

SPP 2/02: Planning and Managing Development Involving Acid Sulfate Soil and Guideline

The SPP identifies those Local Government Areas that may contain land considered to be 'Acid Sulfate Soils'. In particular, this policy seeks to manage both 'actual' and 'potential' acid sulphate soils that could be affected as a result of excavation or filling works.

SPP 2/02 only applies to local government areas listed in the SPP. The former Chinchilla Shire area is not listed and therefore the SPP is not applicable to the study area.

SPP 1/07 Housing and Residential Development including Guideline 1.0

This SPP is not considered applicable as it seeks to ensure that large, higher growth local governments identify their community's housing needs and analyse, and modify if necessary, their planning schemes to remove barriers and provide opportunities for housing options that respond to identified needs.

SPP 2/07 Protection of Extractive Resources and Guideline

This SPP identifies those extractive resources of state or regional significance where extractive industry development is appropriate in principle, and aims to protect those resources from developments that might prevent or severely constrain current or future extraction when the need for utilisation of the resource arises. This SPP is not considered applicable as the site is not identified as containing a Key Resource Area.

TABLE 11-1 TOWN PLANNING SUMMARY TABLE

PLANNING INSTRUMENT	CONCLUSION	SECTION REFERENCE
Properly Made Submissions		
The project has not reached this stage in the process. Upon submission of the request for community designation, a written notice of the project will be provided to both the Department of Environment and Resource Management (DERM) and the Western Downs Regional Council.		
Relevant State Planning Policies		
SPP 1/92 Development and the Conservation of Agricultural Land 1.0	The Minister has identified the SPP as having been appropriately reflected in the Planning Scheme. As the proposed development is not identified within planning scheme as containing good quality agricultural land, the development is considered to comply with the SPP.	Section 11.6
SPP 1/02 Development in the Vicinity of Certain Airports and Aviation Facilities 1.0	The Minister has identified the SPP as having been appropriately reflected in Planning Scheme. The development is considered to be consistent with the requirements of the Airport Overlay Code in the planning scheme and is therefore considered to comply with the SPP.	Section 11.6
SPP 2/02: Planning and Managing Development Involving Acid Sulfate Soils 1.0	Annex 1 of the State Planning Policy lists the former Local Government Areas that contain land that may require assessment against this policy. The policy is not applicable as the Chinchilla Shire is not one of the Local Government Authorities listed in Annex 1.	Section 11.6
SPP 1/03: Mitigating the Adverse Impacts of Flood, Bushfire and Landslide 1.0	The Minister has identified the SPP as having been appropriately reflected in Planning Scheme. The development is considered to be consistent with the requirements of the Airport Overlay Code in the planning scheme and is therefore considered to comply with the SPP.	Sections 5.1.3.6 & 11.2.4
SPP 1/07 Housing and Residential Development including Guideline 1.0	The SPP is not considered applicable. It seeks to ensure that large, higher growth local governments identify their community's housing needs and provide opportunities for housing options that respond to identified needs.	Section 11.6
SPP 2/07 Protection of Extractive Resources and Guideline	This SPP is not considered to be applicable as the site is not identified as containing a Key Resource Area.	Section 11.6
Regional Planning Instruments		
The site is not located in an area that is subject to a Regional Planning Instrument.		
State Planning Regulatory Provision		
The site is not located within a State Development Area and as such is not subject to a State Planning Regulatory Provision		
Planning Scheme Requirements – Chinchilla Shire Planning Scheme		
Strategic Framework		
Desired Environmental Outcome - The Natural Environment	The project is considered to achieve the Desired Environmental Outcome as the development is located on land that is considered to contain limited ecological values or known cultural significance.	Section 11.2.2
Desired Environmental Outcome - Economic Development	The development is consistent with the DEO as the proposal will not affect the economic hierarchy of the area. Moreover, the additional employment that will be generated through the construction of the development will enhance the role of Kogan as a local service centre. In summary, the elements of Chinchilla	Section 11.2.2

PLANNING INSTRUMENT	CONCLUSION	SECTION REFERENCE
	shire that contribute to its ongoing economic development will not be compromised by the development.	
Desired Environmental Outcome - Community and Services	The development will satisfy the communities expectation for the provision of a reliable electricity supply. Furthermore, the development will not compromise the well being of the community, the pattern of settlement or ongoing provision of public spaces.	Section 11.2.2
Rural Area	The proposed development is inconsistent with the intent of the area. It is noted however, that the proposed development is considered to have minimal impact on the Rural Area. The project is not expected to unreasonably compromise the environmental values of the site or the strategy for land in the rural designation.	Section 11.2.2
Development Codes		
Rural Code	Although the proposed substation is located within the Rural Zone, the area is directly adjacent to areas zoned and use for power generation (Kogan Power Station). The proposed development is considered to have minimal impact on the Rural Zone and will complement the existing energy infrastructure on the study site. Given the isolated nature of the site, the proposed substation is not expected to impact negatively on surrounding rural activities. The provision of key infrastructure in close proximity to the power station will allow for the continued growth and prosperity of the locality. Given the limited potential for wider impacts on the Rural Zone the development of the proposed 275kV/500kV Bulk Supply Electrical Distribution Substation is considered an appropriate use for this location.	Section 11.2.2

12.0 SOCIO-ECONOMIC ENVIRONMENT

12.1 EXISTING ENVIRONMENT

As discussed in Section 11, the Project site is zoned 'Rural' under the Chinchilla Planning Scheme, and does not have any other planning restrictions as it is not identified as Good Quality Agricultural Land (GQAL) and does not have a Mining Lease or Mining Development License. The site is vacant with no rural, residential or industrial uses currently occurring.

The site is located south of the existing Kogan Creek Power Station, owned by CS Energy, which is a 750 megawatt, coal-fired power station that provides electricity into the Queensland transmission line via Braemar Substation. The Kogan Creek Power Station currently generates enough electricity to power almost 1 million homes and has a permanent workforce of 41. The power station is neighboured and fuelled by the Kogan Creek Coal Mine, which has an additional permanent workforce of 50 employees. These high impact uses in the area surrounding the Project site means that there is minimal to no residential uses in the immediate area. The most proximate residential communities are located at Warra, Brigalow and Kogan.

Linc Energy are currently operating a Underground Coal Gasification (UCG) facility to the west of the Project site, at Ulinda Park on Sixteen Mile Hall Road. Other uses in the surrounding area include rural residential bordering the Project site to the west, and cattle breeding and fattening rural uses to the south and east.

Agriculture is the economic base of the Chinchilla District, with particular economic strengths in beef and pork production, wool growing, and horticulture being traditional industries in the local economy.

12.1.1 Key Demographic Characteristics

Some of the key demographic characteristics of the Western Downs Regional Council include:

- The 2006 ABS Census states that the Western Downs Regional Council had a total resident population of approximately 28,100 people;
- The Department of Infrastructure and Planning (DIP) estimates that the population reached approximately 30,870 people by 2008;
- The proportion of the population aged between 0 and 19 years old is 29.6% which is marginally higher than the proportion in Queensland (27.6%);
- Western Downs has a lower proportion of residents aged 20 to 34 years old, with 16.7%, when compared to Queensland (20.3%);
- The proportion of residents aged between 35 and 54 years old in the Western Downs, 27.9%, is in line with Queensland (28.6%);
- The proportion of people aged 55 and older in the Western Downs, of 25.7%, is marginally higher than the Queensland average (23.6%);
- 90.5% of occupied dwellings in the Western Downs are separate house dwellings, which is significantly higher than the state average of 79.5%;
- Based on the 2006 ABS Census, the total workforce of the Western Downs Region was approximately 13,500 of which 65.1% are employed full time. Approximately 67.6% of the Western Downs workforce is

employed in upper and lower blue collar occupations, which is higher than the state average of 63.7%; and

- The average annual household income in the Western Downs is substantially less than Queensland with \$57,522 compared with \$68,090 (June 2009 dollars).

The demographic profile of the Western Downs Region is indicative of a traditional rural community, given the dispersed age demographic and the high proportion of separate house dwellings in the region. Whereas some traditionally agriculturally based communities experience a proportion of the young population of working age (between 20 and 35 years old) leaving their communities for diversified employment and education opportunities in urban centres, this is not occurring within the Western Downs. The strong agricultural base, in correlation with the emergence of mining and energy opportunities occurring within the Surat Basin, is currently able to retain (and possibly enhance) this population within the community.

The Project site is located within the ABS Collection District 3081008, which extends north to the Warrego Highway and south to Kogan. Some of the key demographic characteristics of the area surrounding the Project site include:

- The 2006 ABS Census states that the surrounding area had a total resident population of approximately 319 people;
- The proportion of the population aged between 0 and 19 years old in the surrounding area is 34.8% which is higher than the proportion in the Western Downs Region (29.6%);
- The area surrounding the Project site has a proportion of residents aged 20 to 34 years old which is only marginally lower than that of the Western Downs (16.7%);
- The proportion of residents aged between 35 and 54 years old in the surrounding area, 32.6%, is higher than the proportion in the Western Downs (27.9%);
- The proportion of people aged 55 and older in the surrounding area, of 16.9%, is significantly lower than the Western Downs average (25.7%);
- 100% of occupied dwellings in the Western Downs are separate house dwellings, which is significantly higher than the proportion of separate houses in the Western Downs (90.5%);
- Based on the 2006 ABS Census, the total workforce of the surrounding area was approximately 141 of which 68.1% are employed full time. Approximately 59.7% of the residents in the area surrounding the Project site have upper or lower white collar jobs, which is lower than the 67.6% of Western Downs residents; and
- The average annual household income in the Western Downs is substantially less than the Western Downs with \$47,124 compared with \$57,522 (June 2009 dollars).

The demographic profile of the area surrounding the Project site is in line with that of the Western Downs Region as a whole. The area does, however, have a higher proportion of residents aged between 35 and 54 years old which is representative of its rural character, with families establishing themselves in an area which offers low density residential living away from the centralised townships elsewhere in the region. The average household income in the area is also indicative of the rural nature of the surrounding area, and the limited provision of employment opportunities which provide higher incomes which is in line with the lower proportion of white-collar employees in the area.

12.1.2 Landholders and Land Use

The Project site consists of two allotments – Lot 3 of RP 176346 and Lot 4 of RP 176346. Based on data collected from the RP Data database, both allotments are currently owned by Kogan Creek Power Station Pty Ltd and were purchased in January 2009 and June 2007 respectively. The allotment bordering the Project site to the north is also owned by Kogan Creek Power Station Pty Ltd, after being purchased in October 2006. The allotment to the west is under private ownership with an associated dwelling which is approximately 400m from the proposed substation site.

The Project site is not currently used for residential purposes and as the landholders are a corporation involved in similar Public Utility activities to what is proposed at the Project site, the current landholders are not anticipated to experience any negative impacts due to the proposed substation development at the Project site.

12.2 POTENTIAL IMPACT

Social Impacts

There is currently little social value associated with the Project site, therefore the development of an electrical substation on the Project site will have no social impact on how the site functions. In addition, the community profile of the surrounding area, as detailed above, is not anticipated to be impacted by the development of a substation on the Project site.

As mentioned above, the Project site is currently under the ownership of Kogan Creek Power Station Pty Ltd and therefore the acquisition of the site for the development of the substation is not anticipated to negatively impact any residential landowners. Again as mentioned previously throughout the EIS, the allotment to the west of the Project site is under private ownership with an occupied residence. Issues associated with impacts and associated mitigation to this property and residence have been addressed in the following sections:

- Dust (Section 6); and
- Noise (Section 13);
- Electric and magnetic fields (Section 14); and
- Visual amenity (Section 15).

Economic Impacts

As the Project site is vacant, with no existing agricultural or industrial uses, it currently has no economic value contributing to the community, and therefore the development of a substation will have no negative economic impact on how the site functions.

The development of a substation on the Project site, will however, have positive economic impacts on the surrounding area. These include:

- The construction of the substation will generate short-term employment opportunities during the construction phase;

- The development of a substation onsite will potentially generate employment opportunities for the operation of the substation over the long term, such employment may however be located off-site;
- The development of the substation along Banana Bridge Road will enhance the surrounding area as an 'energy precinct' by increasing the existing industries in the immediate area; and
- The substation may enhance the function of the Kogan Creek Power Station.

This increase in economic activity that will be established at the Project site will benefit the surrounding community in the region by generating additional employment opportunities and enhancing the overall economic capacity of the Western Downs region. This has the potential to generate indirect community benefits through the additional economic contribution to the region.

12.3 MITIGATION MEASURES

The development of an electrical substation on the Project site is anticipated to have little negative social or economic impacts on the surrounding community. The Project site is currently vacant, and does not possess any social or economic value as it is not being utilised for residential, agricultural or industrial purposes.

As the development of the substation will not have any associated negative social and economic implications on the surrounding community, there are no mitigation measures required.

13.0 NOISE AND VIBRATION

This chapter provides details of existing ambient noise levels within the vicinity of the Project site. Noise sensitive receivers or locations have been identified along with details regarding their respective distances from the Project site.

Based on the vicinity of residences/human habitation to the Project site, an assessment of potential background and incidental noise levels at noise-sensitive locations, particularly during construction and operational phases has been undertaken. Mitigation measures to reduce the potential impacts have also been identified within this section.

13.1 EXISTING ENVIRONMENT

The acoustic environment in which the substation is proposed to be situated is currently dominated by the noise of the existing Kogan Creek Power Station (approximately 1.5km to the north-east). During field investigations, the power station was clearly audible at the proposed substation site. Due to the magnitude of the power station, its associated noise is expected to be significant in comparison to the expected noise emanating from the proposed substation.

Noise sensitive places as defined by the *Environmental Protection (Noise) Policy 1997* (EPP (Noise)) include:

- Dwellings;
- Library, childcare centre, kindergarten, school, college, university or other educational institution;
- Hospital, surgery or other medical institution;
- Protected areas, or an area identified under a conservation plan as a critical habitat or an area of major interest, under the *Nature Conservation Act 1992*; and
- Parks or gardens open to the public for use other than for sport or organized entertainment.

One noise sensitive receptor (dwelling) has been identified from aerial photography and regional investigations. The residential dwelling exists approximately 400m to the immediate west of the proposed substation on the adjacent property.

13.2 POTENTIAL IMPACTS

Background and incidental noise and vibration levels are expected to be elevated during the construction phase within and surrounding the Project site. Sources of noise and vibration will include earthworks, machinery traffic (both heavy and light vehicle movements), cranes, foundation excavation and boring, structure installations, vegetation clearing, mulching and chipping, access and building construction. The expected noise and vibration levels and exposure periods will be comparable to that of an ordinary construction site.

Due to the large separation distance, and proposed construction works being carried out during less noise sensitive hours, there is a low potential for noise impacts to occur during the construction phase. Furthermore, considering the Project site is located in a rural setting, adjacent to a pre-existing power station, construction noise is not anticipated to be unreasonable or cause nuisance within the immediate area.

During the operational phase, the transformer units of the substation can produce a low-level noise or hum at a frequency of around 100Hz. Transmission lines connecting to the substation can also produce corona noise, which is a crackling sound that is caused by the ionisation of air near the conductors. Corona noise is likely to be greatest immediately following rainfall or fog. Energized transmission lines connecting to the substation can also generate noise, as a result of wind passing across conductors and poles. Wind noise is generally masked by other wind-generated noise such as rustling vegetation.

Noise created during the operation phase, as described above, will not result in an increase the current ambient levels, as these sources of noise already exist within the vicinity from the Kogan Creek Power Station. Noise levels during the operational phase will therefore remain consistent with the levels currently present within the Project area. No increase in ambient noise levels is expected. Furthermore, vibration is not expected to cause an impact during the operational phase.

During maintenance, potential noise and vibration sources include those related to vehicle operation, and noise associated with repairs. However, there is expected to be lower noise and vibration levels associated with these activities, and a shorter period of noise exposure, as compared to the impact during the construction period.

13.3 MITIGATION MEASURES

The proposed substation site has been chosen to ensure the distance between the substation and the adjacent dwelling is maximised whilst minimising clearing of remnant vegetation. Due to the presence of the adjacent Kogan Creek Power Station, the noise impact from the proposed development is expected to be minimal.

A number of mitigation measures have been recommended to minimise the potential noise impact of the proposed development during the construction phase, including:

- Trucks and machinery to be fitted with effective mufflers and regularly maintained to prevent noise sources (i.e. loose bearings, vibrating panels etc);
- Machinery and vehicles are to be maintained in accordance with the manufacturer's recommendations;
- Equipment not being utilised as part of the work should not be left standing with engines idling for an extended period;
- Ensure construction time is kept to a minimum;
- Restricting construction works to those hours permitted by the DERM (normally 6:30am to 6:30pm Monday to Saturday); and
- Publicly communicate construction schedules.

Should works be required outside of those hours stipulated above, potentially affected landholders will be notified.

During maintenance, the potential for noise nuisance would also be minimised by keeping the public informed of maintenance schedules and restricting maintenance works, where possible, to the hours outlined above. There may be infrequent instances where emergency works may be required outside these hours.

The additional proposed mitigation measures for Noise Management are outlined further in the EMP (see Appendix E).

14.0 ELECTRIC AND MAGNETIC FIELDS

14.1 EXISTING ENVIRONMENT

14.1.1 Explanation & Sources of EMF

Electrical and Magnetic Fields (EMF) is the term used for electric fields and magnetic fields produced due to current movements with electrical conductors. Electric and magnetic fields occur in nature (e.g. static electricity, magnetic poles near north and south poles), in all living things (e.g. neuromuscular activity, functioning of cell membranes) and as a consequence of anthropogenic sources (e.g. generation, transmission, distribution and use of electrical equipment).

Electrical fields are caused by voltages (volts) and can be found near any electrical appliance that is switched on at the power outlet, even if it is not operating. High electrical fields are created by high voltages and are strongest close to their source; however, they reduce quickly with increasing distance from the source. Electric fields are measured in volts per meter (V/m).

Magnetic fields are caused by the flow of electricity (current) through a conductor (e.g. wire). Electrical appliances must be switched on and operating to create a magnetic field. Like electrical fields, magnetic fields are greatest close to the source and increase as the current increases. Magnetic field strength, which is measured in milligauss (mG), reduces quickly with increasing distance from the source.

Whereas electrical fields are easily shielded (weakened) by conducting objects such as trees and buildings, magnetic fields are not easily shielded by most materials. Magnetic fields can only be shielded by structures containing large amounts of ferrous metals of similar material. Typical magnetic fields generated from common household appliances and transmission lines are included in Table 14.1.

TABLE 14-1 TYPICAL MAGNETIC FIELDS FROM COMMON ELECTRICAL APPLIANCES

EMF SOURCE	TYPICAL LEVEL (mG)	TYPICAL RANGE (mG)
Electric Stove	6	2-30
Computer	5	2-20
Television	1	0.2-2
Electric Blanket	20	5-30
Hairdryer	25	10-70
Fridge	2	2-5
Toaster	3	2-20
Electric Kettle	3	2-10
Electric Fan	1	0.2-2
Suburban Powerline	10	2-20
High Voltage Transmission Line	20	5-100
Major zone substation (at fence)	2	1-6

Source: Electricity Supply Association of Australia 2001

14.1.2 EMF & Health

The issue of possible adverse effects on human health from EMF has been investigated and studied for more than 40 years. Research to date has been extensively reviewed by bodies such as the World Health Organisation, the International Radiation Protection Association, and the National Radiological Protection Board (United Kingdom). Currently, no causal relationship has been established, however worldwide research is continuing.

Powerlink recognises there is community interest and concern regarding EMF from its facilities, and continues to monitor developments on this important issue. Powerlink endorses the approach taken by the electricity industry, basing its policy and actions on expert advice on this matter from competent health authorities in Australia and from around the world.

The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) is the Federal Government agency charged with responsibility for this issue and its Fact Sheet 'Electromagnetic Fields and Possible Adverse Health Effects' concluded:

"On balance, the scientific evidence does not indicate that exposure to 50Hz EMFs found around the home, the office or near power lines is a hazard to human health" (ARPANSA 2007a).

The full text of this document can be obtained on the ARPANSA website at http://www.arpansa.gov.au/radiationprotection/FactSheets/is_emf.cfm

ARPANSA also advise that where people are concerned about the risk of electric and magnetic fields, certain behavioural modifications with respect to use of household appliances could be undertaken to reduce exposure (ARPANSA, 2007b). That is, because the intensity of EMF drops off significantly with distance from the source, appliances could be moved away from close human contact (ARPANSA, 2007b).

Because of the existence of EMF in almost every part of our living environments and the lack of conclusive causal relationship data, the setting of recommended ambient 'acceptable' EMF levels has been difficult. The National Health and Medical Research Council (NHMRC) in 1989 issued interim guidelines for limitations of exposure to EMF. The NHMRC has rescinded this publication in accordance with its policy of reviewing documents published more than 10 years ago, but for completeness, references are included in this EIS where relevant. ARPANSA has since reviewed the NHMRC guidelines and in December 2006 released the 'Draft Radiation Protection Standard: Exposure Limits for Electric & Magnetic Fields – 0 Hz to 3 kHz' report (ARPANSA, 2006) for review. It is expected that the ARPANSA review, when finalised, will replace the NHMRC publication (i.e. the "Radiation Health Series No. 30, Interim guidelines of exposure to 50/60 Hz electric and magnetic fields").

The ARPANSA review (i.e. Draft Radiation Protection Standard) proposes a set of instantaneous reference levels for EMF exposure at 50Hz and these are outlined in Table 14.2 below whilst the NHMRC interim guideline for continuous public exposure is included in Table 14.3 below.

TABLE 14-2 ARPANSA DRAFT EMF STANDARD FOR LIMITS OF EXPOSURE – GENERAL PUBLIC

EXPOSURE CHARACTERISTICS	ELECTRICAL FIELD STRENGTH (V/m)	MAGNETIC FIELD STRENGTH (mG)
General Public	5,000	1,000
General Public 'Controlled Activity'*	10,000	3,000

* = an activity in which exposure to EMF may reasonably be expected to exceed public exposure reference levels. See ARPANSA for further details.

TABLE 14-3 NHMRC LIMITS OF EXPOSURE – GENERAL PUBLIC

EXPOSURE CHARACTERISTICS	ELECTRICAL FIELD STRENGTH (V/M)	MAGNETIC FIELD STRENGTH (MG)
Up to 24hrs/d	5,000	1,000
Few hrs/d	10,000	10,000

14.1.3 Existing & Proposed EMF Levels

Currently, there are a number of high voltage transmission lines and distribution power lines traversing the area surrounding the project site which, together with domestic sources, contribute to the background levels of EMF. Current levels of EMF are well below the ARPANSA Draft Standard as well as the NHMRC limits of exposure and modeling indicates that even with the installation of the proposed substation, increases in field levels would be limited to areas immediately adjacent to the substation. Field levels outside the proposed substation footprint would experience minor increases and would remain well below the ARPANSA Draft Standard and the NHMRC limits of exposure.

The strength of the EMF from equipment within the substations such as busbars, transformers, reactors and capacitor banks, decreases rapidly with increasing distance. Beyond the substation wall, the EMF produced by the substation equipment is typically indistinguishable from background levels. These relatively low levels are a function of equipment design (as transformers are designed to keep magnetic flux within the unit) and substation layout (where electrical apparatus are set back from the fence for security and access reasons).

In this situation, Powerlink's internal security fence is also set back from the property boundary to provide buffering or room for expansion, thus increasing the separation between publicly accessible areas and the electrical equipment.

As fields reduce quickly with distance, the effect of the above is that magnetic field exposure near substations for members of the public is generally at low levels and comparable to that found in everyday urban environments. Whilst there is no information available for a substation as all are unique and modeling the various equipment using different load/current scenarios for variable distances is too complex, it is suffice to say that there are fields, but they are low (if not negligible) at the nearest receptor.

14.2 POTENTIAL IMPACTS

14.2.1 Health Concerns

The transmission of electricity via the proposed Project has the potential to generate electrical and magnetic fields which in turn raises public health concerns. Recommended exposure levels have been outlined above along with the predicted EMF levels for the area immediately surrounding the proposed substation site once constructed. The expected EMF levels from the proposed substation site are well within the ARPANSA Draft Standard and the NHMRC limits of exposure.

14.2.2 Other Possible Impacts

The proposed Project has the potential to induce voltages on adjacent conducting objects. For example electric fields can induce charges on metal objects which may generate a slight spark and shock if touched. These slight sparks and shocks are harmless but can be perceived as a problem and to reduce the potential for such occurrences, Powerlink Queensland's practice is to earth metal objects (such as fences), as required. Additional impacts that could be caused by EMF include:

- Corona effects - Energised surfaces, such as conductors, are surrounded by regions of high field strength that cause ionisation of the air. The corona effect is a minor electrical discharge as a consequence of ionised air and is strongest during wet weather. Other effects of corona may include gas emissions, audible noise and television and radio interference, as discussed below;
- Gas emissions – Extremely low concentrations of ozone, nitric oxide and nitrogen dioxide gases are generated by corona discharges. The concentrations produced are environmentally insignificant compared to the quantity produced by thunderstorms, solar radiation and wind;
- Audible noise - Corona noise is characterised by the 'crackling' sound that is normally heard during light rainfall. Noise generated by the conductor in normal dry weather is not noticeable; however, it rises during wet weather as a consequence of water droplets on the conductor itself. During such conditions, the noise from rainfall normally overrides the noise from the conductor. Therefore, audible noise from corona is dependent on weather and distance from the conductor; and
- Television and radio reception - Television and radio reception can potentially be affected by corona, however, this is considered unlikely, as corona effects are significantly reduced outside of the substation. Impacts on television and radio reception are unlikely to be experienced.

14.3 MITIGATION MEASURES

The EMF levels at the property boundary of the new substation are expected to be consistent with those for small electrical appliances. The substation compound will be set back from the property boundary and existing vegetation will be retained around the substation compound as a natural buffer. This will increase the separation between publicly accessible areas and the electrical equipment. The nearest residential dwelling is located approximately 400m to the west of the Project site. The new substation site will not affect EMF levels at any residential dwelling.

If a causal impact on television reception is observed due to the Substation operation, Powerlink Queensland will undertake necessary investigations and remedial measures (see Appendix E).

No monitoring is recommended.

15.0 LANDSCAPE CHARACTER AND VISUAL AMENITY

15.1 LANDSCAPE

15.1.1 Background and Methodology

In order to identify the visual value of the existing site, a landscape character assessment has been undertaken. This assessment includes consideration of landscape elements and how they combine to create the character of the subject area. This assessment addresses the way different components of the environment, both natural (vegetation, geology, topography, etc.) and cultural (land use, built environment, enclosure, etc.), interact with each other to be seen by residents or visitors to the area as creating a distinct combination of features. By defining the existing character of the area, any changes as a result of development can be easily identified and characterised as either contributing to the local character or detracting from the existing character of the area.

15.1.2 Existing Environment

The landscape character of the district surrounding the proposed substation generally comprises three distinct land use types – crop land, grazing land with scattered native trees and areas of native woodland. Beyond the flat agricultural plains, the land is gently undulating between 300 to 360 metres above sea level and is largely covered with a combination of grazing land and dry eucalypt woodland.

Also in the immediate landscape is the Kogan Powerstation, coal mine and associated infrastructure.

The landscape of the region is characterised by the following distinctive elements:

- Very low density and generally small scale of development;
- Long straight rural roads with open or filtered views of the rural landscape;
- The meandering Condamine River, associated floodplains and riparian vegetation;
- Open flat or undulating rural plains with a patchwork of agricultural uses;
- Rolling grazing land and vegetated foothills; and
- Dry eucalypt woodland.

As discussed previously, the proposed substation site consists of two lots. The northern lot is approximately 110ha with an 800m frontage on Banana Bridge Road, the southern lot is approximately 118ha with a 570m frontage on Banana Bridge Road. Both lots are generally flat with only a very slight slope from approximately 335m above sea level at the north western corner to approximately 330m above sea level at the south eastern corner. The majority of the northern lot is densely wooded with a mixture of eucalypts, cypress and Bull oak, the north east corner of the lot has been cleared in the past for a farm house and agricultural use. The southern lot is sparsely vegetated with a mixture of native trees and grasses and has been used recently as pasture. Approximately 50% of the proposed substation suite will be located on previously disturbed farming lands.

Across Banana Bridge Road to the north east of the Project site, the existing Kogan Power Station is the dominant feature of the local environment.

15.1.3 Potential Impacts

There is an existing house located approximately 400m to the west of the proposed substation location which may be impacted.

A large portion of the existing woodland vegetation on the northern portion of the site will be cleared to construct the proposed substation. However, as the site is generally flat at the moment, no significant changes to the existing topography are required. Existing screening vegetation will be retained where possible including a buffer strip of approximately 500m width to the Banana Bridge Road frontage, the development of the substation will not change the character of the existing vegetation.

Due to the generally flat topography of the region, the scale of the substation development in comparison to the adjacent power station and the screening of the site by existing native vegetation, the proposed substation will have no significant impact on the landscape character of the region and only limited impact upon the landscape character of the local area in the short term.

Any impact the proposed substation will have on the local landscape character will be minimal in comparison to the existing Kogan Power Station.

15.1.4 Mitigation Measures

The position of the proposed substation on the site allows space to install vegetated buffers to screen the substation, although the connecting transmission lines may impact these areas. To the east a width of 500m will be left undeveloped, to the south a width of 300m will be left undeveloped and to the west a width of 160m will be left undeveloped. Enhancement of the existing vegetation to the southeast of the substation site and installation of new native woodland screen planting to the west of the substation will adequately screen the development from adjacent properties and public roads, allowing it to blend into the local landscape character.

During construction and whilst vegetation planted for screening matures, there will be a visual impact for those residing in the house 400m to the west of the substation site. Once construction of the substation is complete and new screen plantings to the south and west mature, the substation will have no significant impact on the local landscape character.

15.2 VISUAL AMENITY

15.2.1 Background and Methodology

The visibility of the substation site can be assessed by investigating what can be “seen” of the surrounding landscape from within the proposed substation site. Assuming a maximum substation height of 15m above the existing ground level, a viewshed map indicating land visible from this position was plotted based on a GIS digital elevation model and an average woodland vegetation height of 12m (see Figure 15.1). With the screening effect of the Kogan Power Station and the existing vegetation on the surrounding lots, the proposed substation site is visible from only a very limited area of adjacent land to the southeast and west.

15.2.2 Existing Environment

The existing woodland to the north and east of the proposed substation ranges in height from a 5-7m tall cypress to 12-15m tall eucalypts with a very dense understorey of Bull oak. (for a detailed assessment of the species and characteristics of the existing vegetation, see Section 10).

From the substation site there are intermittent views to the west and to the south east. Views to the northwest through to the east are screened by the existing woodland vegetation. Intermittent views to the south are available to the adjacent lots but are limited at a distance of approximately 1km from the site by woodland vegetation and the undulating terrain.

Isolated remnant vegetation associated with road corridors and property boundaries provide intermittent screening to views of the site from Banana Bridge Road in the southeast and Sixteen Mile Hall Road in the west.

15.2.3 Potential Impacts

The proposed substation is assumed to be between 15 - 25m in height and consists of electrical equipment and overhead wires; through which views of the adjacent woodland planting will be visible.

The existing woodland vegetation to the north and east of the proposed substation site will be retained and along with the position of the existing Kogan Power Station, the site cannot be seen from the Warego Highway. There are no local viewpoints from which the site is visible. The visual impact of the proposed substation development will be minimal on a regional scale.

Local visual impact will be moderate due to clearance of existing vegetation during the site preparation, line installation and construction period when the site will be partly visible from Banana Bridge Road, Sixteen Mile Hall Road, the existing house to the west of the site on lot RP176346-1 and other local properties.

Any visual impact the proposed substation will have on the local area will be minimal in comparison to the existing Kogan Creek Power Station.

15.2.4 Mitigation Measures

The position of the proposed substation on the site allows space to install vegetated buffers to screen the substation. To the east a width of 500m will be left undeveloped, to the south a width of 300m will be left undeveloped and to the west a width of 160m will be left undeveloped. Enhancement of the existing vegetation to the southeast of the substation site and installation of new native woodland screen planting to the west of the substation will adequately screen views of the development from adjacent properties and public roads.

Development of the site should include the following requirements:

- Minimise the removal of existing woodland vegetation outside of the immediate construction site area;
- Enhance existing vegetation buffers by the addition of new plantings of native tree species matching the existing species mix; and
- Install new native woodland vegetation buffer planting to the west of the substation site, with a species mix matching the existing vegetation buffer to the east of the site.

With the enhancement of woodland buffers to the south and west of the site, the permanent facility will have no long-term visual impacts regionally and will have no significant long-term visual impacts locally.

All works are to be undertaken in accordance with the EMP (see Appendix E).

16.0 TRANSPORT INFRASTRUCTURE AND TRAFFIC

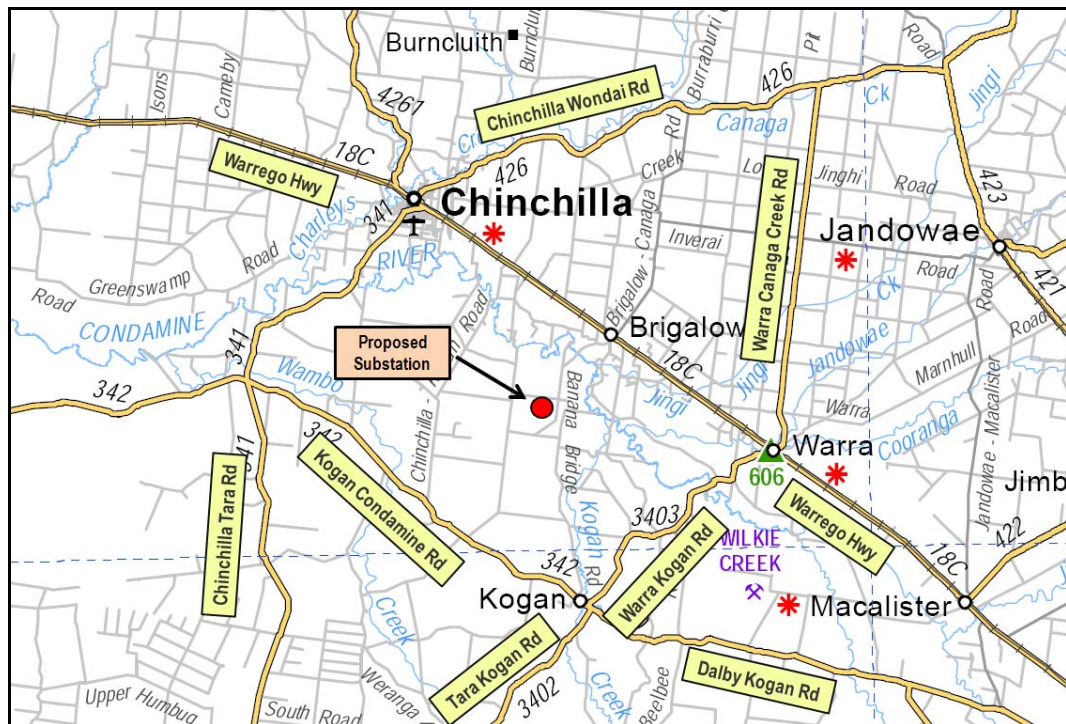
16.1 EXISTING ENVIRONMENT

16.1.1 Road Network

The area adjacent to the proposed substation comprises a number of State controlled roads under the management of the Department of Transport and Main Roads (DTMR) and local authority roads under the management of the recently formed “Western Downs Regional Council”. Figure 16.1 shows the State controlled roads in yellow and the local roads in grey. The most relevant State controlled roads are:

- Warrego Highway (included in the Auslink national road network);
- Tara Kogan Road;
- Kogan Condamine Road;
- Chinchilla Tara Road;
- Warra Canaga Creek Road;
- Chinchilla Wondai Road;
- Warra Kogan Road; and
- Dalby Kogan Road.

FIGURE 16.1 STATE CONTROLLED AND LOCAL ROADS NEAR THE PROPOSED SUBSTATION



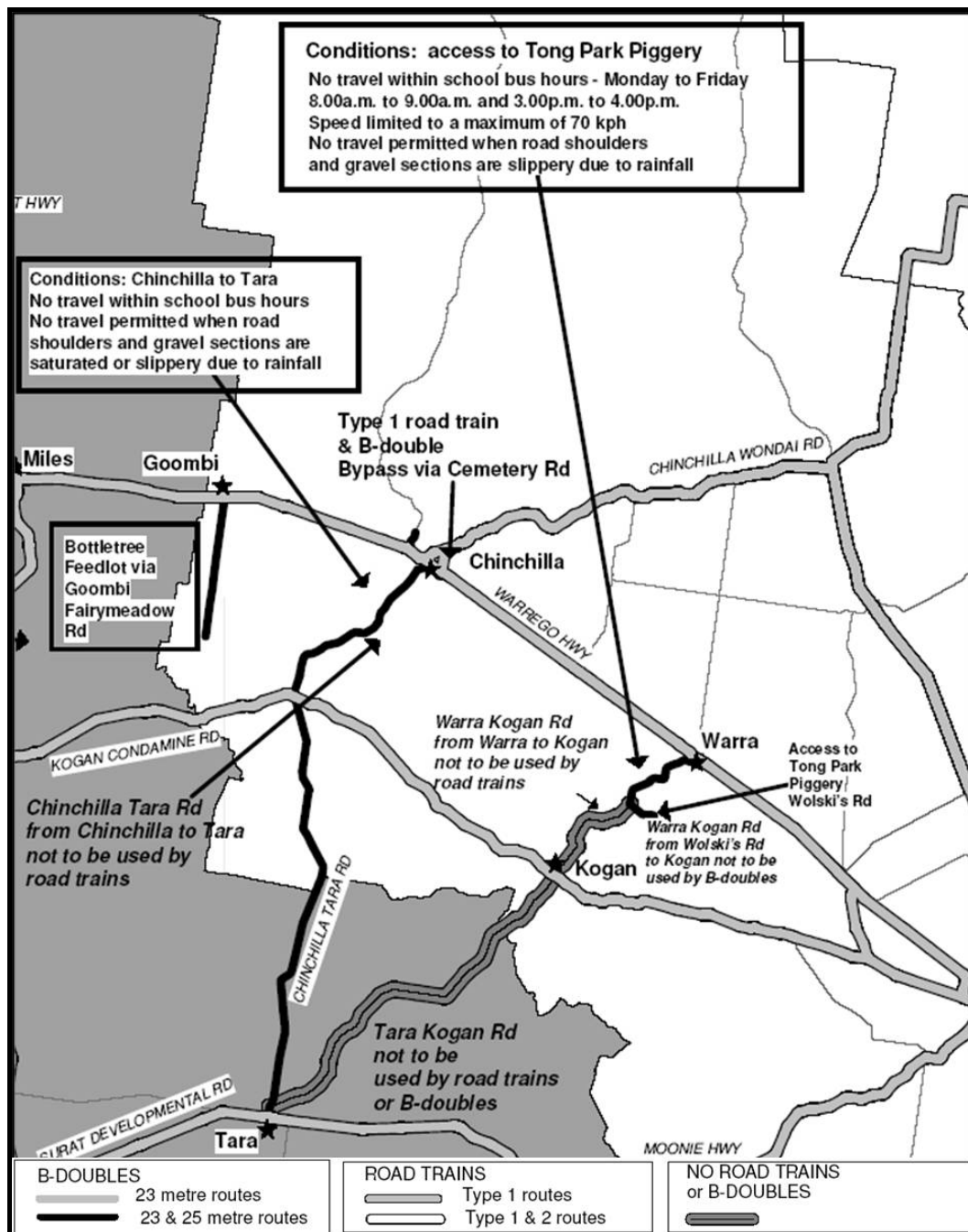
Detailed information about the surface type, daily traffic volumes and approximate width of the above mentioned roads is provided on Table 16.1, where it is shown how the Warrego Highway is the corridor that carries the majority of traffic near the study area (AADT = 2111). It is also shown that the percentage of heavy vehicles travelling in the area is relatively high, particularly along the Warrego Highway (28%).

TABLE 16-1 ROAD INFORMATION

	AADT	%HV	SURFACE TYPE	APPROX. WIDTH (M)
Warrego Highway	2111	28	Sealed	10
Tara Kogan Road	151	12	Sealed	7
Kogan Condamine Road	192	24	Sealed	9
Chinchilla Tara Road	976	12	Sealed	8
Warra Canaga Creek Road	Unknown	Unknown	Unknown	Unknown
Chinchilla Wondai Road	272	17	Sealed	9
Warra Kogan Road	47	10	Sealed for most of its length with some unsealed sections	9
Dalby Kogan Road	378	20	Sealed	8

In terms of the heavy vehicle size restrictions in the area, Figure 16.3 provides an indication of the current situation. It is important to note that operational restrictions for “road trains” are currently in place along Wara Kogan Road and Tara Kogan Road during school set-down and pick-up periods and during periods of wet weather.

FIGURE 16.2 HEAVY VEHICLE RESTRICTIONS NEAR THE SITE

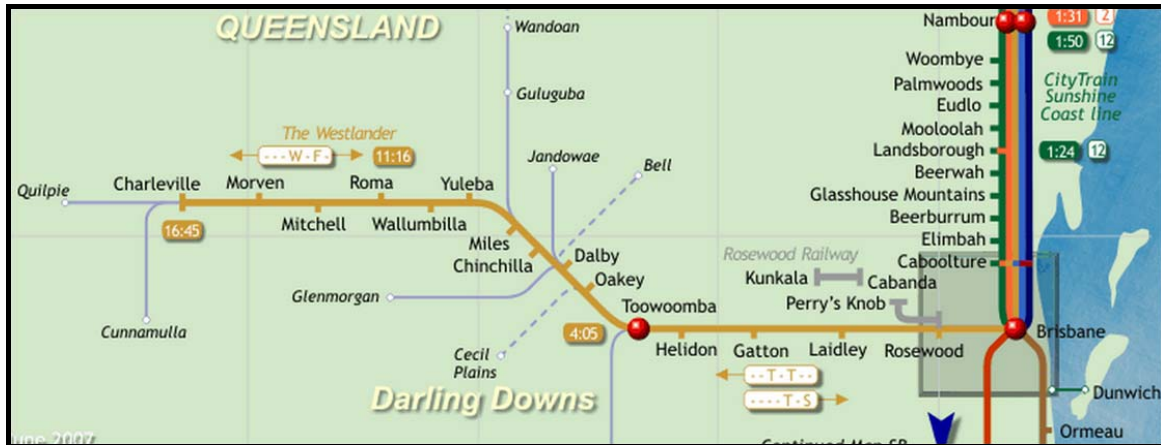


16.1.2 Planned Road Upgrades

The DTMR Roads Implementation Program for the Darling Downs region indicates that some improvements are planned to be implemented on a number of roads in the study area, such as Dalby Kogan Road, Chinchilla Tara Road and Kogan Condamine Road. The majority of these improvements, however are considered to be irrelevant due to the distance to the substation and/or the nature of the upgrades. It is important to highlight the proposed upgrade of the southern end of both Banana Bridge Road and Warra Kogan Road to 2-lane sealed standard.

16.1.3 Rail Network

FIGURE 16.3 THE WESTLANDER RAIL ROUTE



A rail line passes near the area (it runs parallel to the Warrego Highway). Passenger services currently operate twice a week along this route, designated as “The Westlander”, which connects Brisbane to Charleville, passing through Toowoomba.

FIGURE 16.4 RAIL LINE NEAR THE STUDY AREA



16.1.4 Flight Paths and Facilities

The closest airport is at Chinchilla, located approximately 15 km to the north-west of the existing Kogan Power Station. The number of flights currently using this airfield and respective frequency is undetermined.

16.2 POTENTIAL IMPACTS

16.2.1 Flight Paths and Facilities

No impacts are expected to occur to aircraft operation given the distance between the airport and the proposed substation.

16.2.2 Construction Period

During the construction phase, a light increase of traffic volumes on the roads adjacent to the substation is expected to occur given to the necessary transport of materials, equipment and personnel.

It is anticipated that the construction vehicles will use the Warrego Highway and Banana Bridge Road to access the site from both the eastern (Toowoomba / Dalby) and western sides (Chinchilla), as shown in Figure 16.6. Semi-trailers will be used during this phase and therefore the limitations applied to “road trains” and “B-doubles” will not be exceeded. However, some construction vehicles are likely to carry “oversize” loads, which can cause some safety issues for other road users.

16.3.2 Construction Phase

The anticipated route to be used by construction vehicles (see Figure 16.6) must be inspected prior to the commencement of the construction works. The access to the substation site must be cleared of any obstacles or constraints and the pavement must be in good condition to ensure that access to the site can be achieved even under periods of wet weather.

If any “oversize” load needs to be transported to the site, the local Main Roads office should be contacted to seek approval, obtain necessary permit/s and enquire about standard procedures that must be followed in such situations. Specific times of the day will potentially be established for transport and other arrangements will have to be made such as the use of escort vehicles.

17.0 CULTURAL HERITAGE

17.1 NON-INDIGENOUS CULTURAL HERITAGE

17.1.1 Background and Methodology

The assessment of the region's significant cultural heritage areas, objects and values (both potential and realised) are fundamental to the successful planning of proposed development. This section describes the non-indigenous cultural heritage values and history associated with the area surrounding the Project site. Historical descriptions of Project locale have been provided. Community cultural heritage values as well as sites/places listed on State and Federal heritage lists are discussed. Finally, potential impacts which may occur as a result of the Project are discussed and mitigation measures and recommendations provided.

An assessment has been conducted into the non-indigenous cultural heritage values of the study area. The following resources were used in the preparation of this section:

- Searches of the following heritages agencies' databases:
 - The National Trust;
 - The State Heritage Register; and
 - The Register of National Estate.
- Consultation with local Warra resident, and Secretary of the Warra Progress & Heritage Society, Lyn Taylor; and
- Consultation with former long-time Kogan resident and previous owner of the Kogan Hotel – Berryl Dwyer.

The aforementioned methodology was utilised in order to gather information on a wide array of cultural heritage values for the region ranging from those places and sites listed on State and National heritage registers, to places/sites which hold particular significance to specific community members.

17.1.2 Existing Environment

Discussions with Lyn Taylor (Secretary of the Warra Progress & Heritage Society) and Berryl Dwyer (previous owner of the Kogan Hotel), has resulted in the following account of historical events within the region:

On October 1st, 1844, German explorer Ludwig Leichhardt led his first expedition from Jimbour (approximately 15km north-west of Warra) to Port Essington in the Northern Territory. By following the Condamine River, Leichhardt and his expedition team arrived in Warra on the fourth day of the journey, and set up camp along the river bank. A memorial entitled "Leichhardt's Legacy" has been erected at the apparent campsite, and exhibits his journal entry for the event.

The Warra region was settled in the 1840s by Henry Dennis, and the town subsequently flourished with the establishment of coal mining operations. After five years of operation, the Warra coal mining industry ceased, and the population declined as result of the migration of miners to alternative locations. Mining has since been replaced by grain and cotton growing, which has resulted in the successful establishment of a rich agricultural heritage.

In 1877, the western railway line was extended from Dalby to Warra, and was used to transport passengers and produce between Brisbane and Charleville. The restored Warra Railway Station is now located within the Richard Best Memorial Park, which accommodates the Progress & Heritage Society Museum. According to Lyn Taylor, the Progress & Heritage Society Museum frequently exhibits historical photographs taken within the Warra region, entitled “Warra Remembers”.

17.1.2.1 Significant Sites/Places

As a result of this investigatory study into the non-indigenous cultural heritage values associated with the area surrounding the Project Site, it has been identified that whilst the region surrounding Warra has numerous sites and places of cultural heritage significance, there is an absence of significant sites in the vicinity of the substation. For the purposes of this Section, the term “culturally significant” describes those areas which are deemed culturally significant either by State and Federal heritage agencies, by industry professionals and by interested community members. Distinctions are made between site/places of these varying significance levels.

For the purposes of this section, only those sites and places located in the direct vicinity of the Project site will be examined in detail. It is acknowledged that there are numerous other significant cultural heritage sites located within reasonable proximity to the Project site, however the Project is not expected to impact on these areas.

17.1.2.2 Cultural Heritage Listings

Review of the Queensland Heritage Register (European) indicates an absence of non-indigenous cultural heritage sites within the immediate vicinity of the Project site (DERM, 2009). Australian Heritage Database searches for the suburbs of Warra, Kogan, Dalby and Chinchilla, have identified the Boonarga Cactoblastis Memorial Hall (for its association with the defeat of the prickly pear plague; a major event in Australia’s agricultural history), and the Chinchilla Sands Local Fossil Fauna Site (a highly significant Pliocene fossil site), neither of which are located within the vicinity of the Project site (DEWHA, 2009). No Commonwealth or State significant non-indigenous cultural heritage sites exist within Project site locale.

17.1.2.3 Other Sites of Cultural Significance

Consultation with the Warra Progress & Heritage Society secretary (Lyn Taylor) and former owner of the Kogan Hotel (Berryl Dwyer), has resulted in identification of areas/objects within the region that are considered socially important by local and regional stakeholders. Areas/objects of social significance, important in maintaining the community’s integrity, include:

- Warra Memorial Hall;
- Richard Best Memorial Park (Warra);
- Campsite of Ludwig Leichhardt (Warra);
- Warra Cemetery;
- Police Station (est. 1908) (Warra);
- Post Office (est. 1908) (Warra);
- Warra Pub (est. 1908);
- Church (est. 1907) (Warra);
- Railway (est. 1877) (Warra);

- Memorial site for first Government owned coal mine in Queensland (Silhouettes and skip replica made of original railway platform board) (Warra); and
- Historical subway (Warra).

None of the above mentioned significant places/objects are within the vicinity of the Project footprint.

17.1.3 Potential Impacts

The Project is not expected to impact upon areas or objects of social importance or cultural significance. With consideration of the broader context of the area surrounding the Project site (i.e. Kogan Creek Powerstation), the proposed development is not expected to have a negative impact on the lifestyle of local residents, or on the appeal of places frequently visited within the region. The likely presence of remnants of cultural heritage has not been dismissed, however.

17.1.4 Mitigation Measures

The impact of the proposed development on matters of cultural significance is expected to be negligible. However, if during construction, historic relics are discovered, work should cease until an appropriately qualified heritage assessor has been afforded the opportunity to assess any objects of possible heritage value, *in situ* in accordance with the EMP (see Appendix E).

17.2 INDIGENOUS CULTURAL HERITAGE

All significant Aboriginal cultural heritage in Queensland is protected under the *Aboriginal Cultural Heritage Act 2003*, and penalty provisions apply for any unauthorized harm. Under the legislation a person carrying out an activity must take all reasonable and practical measures to ensure the activity does not harm Aboriginal Cultural Heritage.

The construction activities that are proposed for the substation site is subject to both Category 4 and Category 5 activities of the Duty of Care Guidelines. For example:

Where an activity is proposed under category 5 there is generally a high risk that it could harm Aboriginal cultural heritage. In these circumstances, the activity should not proceed without cultural heritage assessment.

Where an activity is proposed under category 5, it is necessary to notify the Aboriginal Party and seek:
 (a) Advice as to whether the feature constitutes Aboriginal cultural heritage; and
 (b) If it does, agreement as to how best the activity may be managed to avoid or minimise harm to any Aboriginal cultural heritage.

A search of the Cultural Heritage Database and Register completed on the 5th of November 2008 shows significant Aboriginal cultural heritage areas and objects in the vicinity of the Kogan Creek Power Station and surrounding area. These include scarred trees, artefact scatters, artefacts, shell material and a stone well. It is worth noting that significant cultural heritage is likely to be found in those areas that have not been previously subjected to a cultural heritage survey.

There are two previously known Aboriginal parties for the area. However, recent native title activity now poses some initial constraints to the project. Note, further investigations are required by Powerlink to identify who is the Aboriginal party(s) for this project.

Aboriginal cultural heritage, which may occur on the substation site, is protected under the terms of the *Aboriginal Cultural Heritage Act 2003* even if there are no records are recorded in an official register and whether or not they are located in, on or under private land.

Powerlink Queensland will be required to obtain a registered cultural heritage management plan (CHMP) with the identified Aboriginal Party(s) for this project. The approved CHMP will include a cultural heritage survey of the areas identified as being subject to Category 5 activities and a final report proposing how Powerlink Queensland should avoid harm to cultural heritage during construction.

18.0 GREENHOUSE GAS EMISSIONS

18.1 INTRODUCTION

Greenhouse gases (GHG's) are atmospheric gases which reduce the loss of heat from the earth into space. While these gases are naturally present in the atmosphere, significant additional amounts are released when fossil fuel based products (like coal, natural gas, and petrol) are burned. Because of the gases ability to capture energy, increased levels mean more heat is captured, resulting in an increase in global surface temperatures (through the 'enhanced' greenhouse effect). The impacts of this temperature increase are accepted to include a rise in sea levels, increase in frequency and intensity of severe weather events (flood, drought, etc) and changes in rainfall patterns.

The built environment and infrastructure are responsible for these emissions when trees are cleared for access (removal of carbon sink) and where liquid fossil fuels are used to transport materials and equipment for construction and operation. Energy (as both fuel and electricity generated from fossil fuels) is also consumed in the manufacture and production of the materials used, and can be considered to be 'embedded' in the final product.

By recognising these links and accounting for them in the development phase; many of these contributions can be significantly reduced or eliminated through better planning and design decisions.

In addition to the direct net impact of the development on, and contribution to greenhouse emissions, there are also potential impacts of climate change on the development. Adaptation and mitigation measures can be selected to manage the changes in environment and stakeholder expectations to determine the success of the development in the medium to long term.

The greenhouse gas footprint of the substation was assessed based on vehicle movement and construction materials data provided by the client and a series of assumptions regarding travel distance and load capacity.

18.2 ADAPTATION PLANNING

With regard to the changing physical and political environment (as discussed in Sections 6.2.1 and 6.2.2) there are a number of considerations in the planning of the project which can help to control any exposure. A brief summary of these issues is provided in the below table.

As with any risk management strategies, hazards don't necessarily need to be eliminated, but controlled to within acceptable risk tolerances.

TABLE 18-1 CLIMATE CHANGE RISK AND ADAPTATION SUMMARY

RISK	IMPACT	DESIGN RESPONSE
Flash Flooding	Inundation and high velocity water movements, erosion, access restrictions and material damage.	Any grading of land, drainage system and bunding to take risk into account. Rate and nature of degradation of materials. Material selection and maintenance schedule to consider. Access to repairs/ maintenance may be impeded due to weather events. Insurance premiums / excess may increase with more frequent severe weather events.
Severe Storms & Tropical cyclones	High wind loading, lightning strike and flash flooding. Cyclones may become more intense and move further South more often, impacting the study area.	Design to account for wind loading as necessary (AS/NZS 1170.2:2002 – Structural design actions – Wind actions). Proper grounding of structure. Drainage design to account for severe short term events (as per above).
Temperature Rise	Cyclones may become more intense and move further South more often, impacting the study area.	Specifications for materials should account for these issues. Rate and nature of degradation of materials and potential increase in maintenance schedule to be considered.
	Increased bushfire risk and season, destruction of plant as well as overheating of lines, transformers etc.	Firebreaks to be maintained and appropriately sized for conditions and level of acceptable risk.
	Network congestion from increased peak loads associated with air-conditioning use etc. Decrease efficiency transmission and generation facilities.	Design and capacity of the substation to include sufficient redundant capacity to account for potential future inefficiencies.
Changing Rainfall Patterns	Changes to ground conditions (wetting and drying cycles) leading to impacts on footings and foundation materials.	Material specifications should account for such potential stresses. Maintenance and testing systems and frequency should be developed with regard to acceptable level of risk.
Legislative response to CC	Distribution patterns for electricity are likely to be effected by both CPRS and MRET, favouring renewable and lower intensity capacity.	Substation capacity should account for potential future renewable generation sources, such as biogas from the Tong park Piggery etc.

18.3 GREENHOUSE GAS FOOTPRINT

Typically Greenhouse Gas (GHG) emissions reporting involves categorisation of the emissions into three 'Scopes' or types of emissions. This helps to delineate emissions with regard to the source and level of control.

These 'Scopes' may be defined as follows:

- Scope 1 emissions are direct, controllable emissions that come from sources owned and controlled by the company (such as fuel-use by vehicles or natural gas consumed on site);
- Scope 2 emissions are indirect emissions that come from the generation of purchased electricity; and

- Scope 3 emissions are a consequence of the activities which are not in the direct ownership or control of the company, but are a result of their use of third party goods and services. Items such as domestic flights, taxis or emissions from the production of consumables such as paper all fit under this category.

Scope 3 emissions are generally reported voluntarily and separately from a company's other emissions, as they will form part of the 'primary' (scope 1 and 2) emissions of another entity. A preliminary desktop audit has summarised the major project elements as follows:

TABLE 18-2 GREENHOUSE GAS (GHG) SOURCES BY SCOPE

SCOPE 1	SCOPE 2	SCOPE 3
Tree clearing for site preparation. Fuel used in company owned heavy vehicles for site works. Fuel used in company owned light vehicles (for staff transport, delivery of materials etc). Any fuel used for on site generation (industrial lighting etc).	Grid Electricity used in temporary site office.	Domestic flights for staff and management to and from site. Other project consumables (paper etc). Wastes generated as a result of the project. Energy / Emissions embedded in construction materials. Third party site works and vehicle movements.

18.4 VEGETATION CLEARING

The proposed substation development site includes some vegetative cover which will be cleared for construction. While this will be partially replaced by site planting, there is expected to be some net loss of vegetative-carbon sink due to the substation development. No modelling is currently available for estimation of the scale of the lost sink. Refer to Section 10 (Flora and Fauna) for more details.

18.5 MATERIALS FOR CONSTRUCTION

With National Greenhouse and Energy Reporting System (NGERS) now in place, information on the embedded energy and GHG intensity of many common construction materials will be readily available for such reviews. The following has been calculated based on inputs provided by the client and assumptions based on transport-industry standards and averages, and emission factors available produced by VIC Roads as part of the Greenhouse Gas Calculator model (Feb 2008).

TABLE 18-3 GREENHOUSE GAS EMISSION ASSOCIATED WITH CONSTRUCTION MATERIALS

MATERIAL	AMOUNT	UNIT	EMBEDDED ENERGY T CO ₂ -E/UNIT OF FINAL PRODUCT	EMISSIONS T CO ₂ -E
Substation				
Concrete (assume 15% cement mix)	900	m ³	0.25752	232
Reinforcement (assumed steel, non recycled source)	400	Tonnes	2.65	1,060
Clean Fill	1,000	Tonnes	0.0015	2
Total				1,293

18.6 HEAVY VEHICLE FUEL USE

Heavy vehicles (trucks, pilling rig, excavators and crane etc) will be used to transport materials to and from the site. It has been estimated that in the region of 320 round trips will be made to and from the site to deliver materials and equipment, and to remove site wastes:

- 9 Low loader deliveries for bulk earthworks machinery (Bulldozers, Excavators and Drotts) and 9 trips for collection;
- 10 Semi-trailer deliveries for site cranes (plus 10 trips for collection)
- 20 Semi trailer deliveries for reinforcement steel;
- 5 Semi trailer deliveries for other materials and civil construction machinery;
- 5 Semi trailer deliveries for Excavators/Bobcats;
- 100 Concrete Truck deliveries;
- 35 Semi-trailer deliveries for prefabricated structures and plant equipment; and
- 50 Deliveries of materials for site finishing (turf, rock etc).

It has been assumed that all suppliers and materials will be provided from the Toowoomba area (approx 120 km away) with an average travel distance (return trip) of 240 km. This results in a total heavy vehicle travel distance of 60,720 km for the substation. The Australian Bureau of Statistics (ABS, 2008) estimate Articulated trucks to consume in the region of 54.6 L of diesel per 100km travelled, and 28.6 L / 100 km for rigid trucks. In total around 23.8 kL of diesel has been calculated for this use.

In addition to the above, some equipment will be used at the site for civil and construction works:

- 3 Bulldozers for 3 Months;
- 3 Excavators for 3 Months;
- 3 Drotts for 3 Months;
- 10 Cranes for 3 Months; and
- 5 Bobcats for 3 Months.

Assuming the site operates for 8 hours per day 5 days per week, 12,480 machine hours are accrued. According to “Spon’s Civil Engineering and Highway Works Price Book” (2005) heavy machinery for site works use in the region of 38 L diesel per hour with 80% capacity usage (leaving around 30L/hour being used). Small bobcats where assumed to use half this amount. The National Greenhouse Accounts (NGA) Factors (June 2009) indicate 2.7 tonnes of CO₂-eq per kL of diesel fuel. Based on these values; the substation would contribute 918 tonnes of GHG.

18.7 LIGHT VEHICLE FUEL USE

Private vehicles usage are estimated to vary over the project schedule. Site staff will be going to and from the site daily from the Toowoomba area (approximately 120 km away). The following figures have therefore been assumed:

- 12 site vehicles making daily trips over 12 month construction schedule; and
- Testing and commissioning (12 vans and small trucks) for final 3 months.

Using an average return trip distance of 240 km, a total of 3,900 return trips and a total distance of just under 1 million km are estimated to be travelled. ABS (2008) estimate passenger vehicles use 11.1 L of petrol per 100km travelled. The testing vehicles where assumed to be light commercial vehicles at 12.5 L diesel per 100 km’s. In total around 106.5 kL of fuel is expected to be consumed based on the above assumptions. Approximately 254 tonnes of greenhouse gas are contributed to the footprint from this source.

It should be noted that this number is highly dependent on driver behaviour, location and site conditions, and would need to be closely monitored (through the use of fuel cards, etc) to ensure the appropriate reporting thresholds are observed.

18.8 ELECTRICITY FOR TEMPORARY SITE AMENITIES

No temporary site amenities have been indicated. It is assumed all staff will be Chinchilla based.

18.9 EMISSIONS SUMMARY

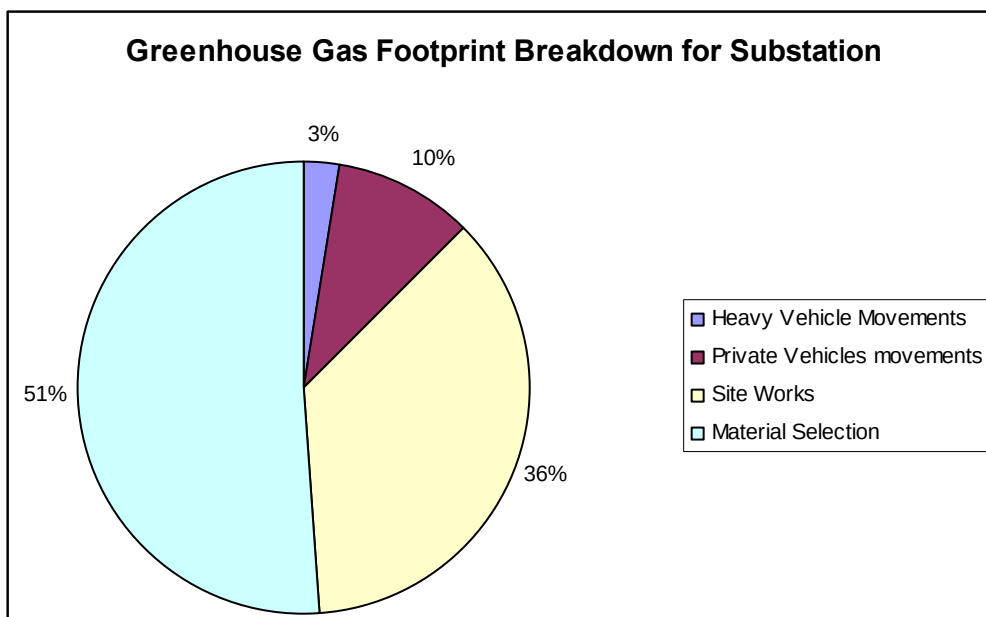
The following table summarises the calculated GHG emissions according to the Scopes that categorises them. While Scope 3; or indirect auxiliary emissions is the largest emissions group, Scope 1 or direct emissions is only slightly less.

TABLE 18-4 EMISSIONS SUMMARY

	SCOPE 1 (T CO ₂ -E)	SCOPE 2 (T CO ₂ -E)	SCOPE 3 (T CO ₂ -E)
Loss of Carbon Sink	unknown		
Energy Embedded in Construction Materials			1,293
Heavy Vehicles - Deliveries			64
Heavy Vehicles – Site Works	918		
Light Vehicles for Staff Transport	254		
Totals	1,172 t CO ₂ -e	0 t CO ₂ -e	1,357 t CO ₂ -e

This is reinforced by the below chart, which illustrate the division of Scope 1 and 3 emission sources in almost equal proportions. It is therefore evident that the greatest reduction in emissions could be achieved by selection of materials with greater recycled content and which are locally sourced as well as back loading of materials where possible and proper planning for efficient and well-organised site works.

FIGURE 18.1 EMISSIONS BREAK-DOWN PIE CHART FOR SUBSTATION



18.10 POTENTIAL IMPACTS

Australia's 2007 Greenhouse Gas Inventory for Kyoto reporting estimates emissions from the construction sector to be 1,755,940 tonnes, which excluded 'embedded' energy in materials consumed. The equivalent emissions for this project would account for around 0.07% of this total.

18.11 MITIGATION MEASURES

In addition to being impacted by the climate, the process of development, construction and operation will also evolve emissions which may contribute to anthropogenic climate change.

Management strategies can be put into place to minimise these emissions to the minimum necessary.

Site Preparation

- Consider clearing minimisation when selecting transmission line route and substation location; and
- Offset of significant trees removed during construction and operation.

Material Selection & Transport

- Selection of locally sourced materials and labour to reduce transport emissions;
- Selection of long wearing and robust materials to minimise lifecycle emissions;
- Selection of materials with recycled content, and which are in turn recyclable;
- Using standard dimensions to make use of unused product and reuse following disassembly easier;
- Take advantage of back-loading for materials transport where feasible to do so; and
- Use of certified sustainable timbers if available.

Efficient Plant and Equipment

- Appropriate maintenance intervals for equipment and vehicles; and
- Proper sulphur hexafluoride (SF₆) storage, leakage detection and recovery capacity.

Auxiliary Emissions

- Coordination of staff travel to minimise return trips;
- Specify GHG monitoring and reporting for all sub-contractors (also important for NGERS reporting); and
- Segregation and recycling of construction wastes.

19.0 CONSULTATION

19.1 TERMS OF REFERENCE CONSULTATION

At the timing of writing this draft, the only formal consultation undertaken was a workshop on developing the Terms of Reference (ToR) for the EIS. The workshop was held in Toowoomba on the 25th September. Organisations invited to attend the workshop included:

- Western Downs Regional Council;
- DERM;
- DTMR;
- Department of Primary Industries and Fisheries;
- Brigalow Jimbour Floodplains Group;
- Chinchilla Landcare Group; and
- Condamine Alliance.

These organisations were mailed a copy of the draft ToR prior to the workshop.

Organisations that attended the workshop were:

- Western Downs Regional Council;
- DERM; and
- DTMR.

The objectives of the workshop were to:

- Provide a briefing/overview of the project;
- Provide a briefing/overview of the draft ToR; and
- Obtain feedback from attendees on the ToR.

All organisations were provided with the opportunity to provide written feedback on the draft ToR following the workshop. Submissions were received from DTMR and DERM and the issues they raised have been incorporated into the ToR in Appendix A.

19.2 FUTURE CONSULTATION

Further stakeholder consultation will occur on the draft EIS. This consultation will include:

- Briefing to the Western Downs Regional Council;
- Discussions with CS Energy (owners of the proposed substation site);
- Media releases;
- Display of the draft EIS for review and comment. This display includes hard copies at Council Chambers and libraries, mailing of electronic copies to those who request and posting on the Powerlink and Conics websites;
- Establishment and promotion of a 1800 number for stakeholders to make queries or provide feedback; and
- Newsletters posted to stakeholders.

The outcomes from this consultation will be included in the final EIS.

20.0 ENVIRONMENTAL MANAGEMENT PLAN

An Environmental Management Plan (EMP) for the project has been completed using the Powerlink Environmental Management Plan template. The EMP can be found in Appendix E.

21.0 ENVIRONMENTAL COST-BENEFIT SUMMARY

21.1 BACKGROUND AND METHODOLOGY

The environmental cost benefit assessment has assessed the existing environmental costs associated with proposed substation site and provided comparison analysis with the anticipated benefits associated with the construction and ongoing operation of the proposed sub station facility. Where environmental and economic costs/benefits can not be quantified, they have been described to be consistent with the terms of reference for Environmental Cost Benefit Analysis defined by the Queensland Treasury.

21.2 SHORT TERM COSTS AND BENEFITS

The development of a substation on the Project site is considered to have minimal short term environmental impacts both on the Project site itself and within the surrounding area.

The Project site is zoned 'Rural' under the Chinchilla Planning Scheme, but has not been utilised for agricultural purposes. The development of a substation will therefore not reduce the agricultural production capacity of the Project site. Whilst there is a high provision of Good Quality Agricultural Land (GQAL) within the surrounding area, and across the Chinchilla District as a whole (see Section 5.3), the Project site is not identified as GQAL under the Chinchilla Planning Scheme. The quantity of GQAL in the Chinchilla District will therefore not be negatively impacted by the development of a substation on the Project site.

The Chinchilla Planning Scheme identifies the Biodiversity Planning Assessment areas within the District. These areas have, or potentially have, high conservation values. The Project site is not identified as a Biodiversity Planning Assessment Area under the Planning Scheme, nor does it have any other identified conservation values. Therefore the development of a substation on the Project site will not have any costs on the provision of area of high conservation values within the surrounding area.

As discussed in Section 18, the short term cost generated by an increase in greenhouse emissions is related to the construction activities involved in establishing the proposed substation. These greenhouse gas emissions have been calculated based on the various construction components and activities. The calculated greenhouse gas emissions are as follows:

- Heavy Vehicle Movements – 64 tCO₂-e
- Private Vehicle Movements – 254 tCO₂-e
- Site Works – 918 tCO₂-e
- Material Selection – 1,298 tCO₂-e
- Total – 2,534 tCO₂-e

From an employment perspective, the development of a substation on the Project site will generate short term employment opportunities. The construction of the substation facility is expected to employ between 20 to 30 employees onsite. It is estimated that approximately 10% to 15% of the workforce are expected to be sourced from the local Dalby/Chinchilla area with an additional 15% expected to be sourced from the Toowoomba region.

The remainder of the onsite workforce will be sourced predominantly from the broader South East Queensland region.

21.3 LONG TERM COSTS AND BENEFITS

The development of a substation on the Project site is considered to have minimal long term environment impact both on the Project site itself and within the surrounding area. The long term impact of the proposed development is in keeping with the potential short term implications.

The Project site is zoned 'Rural' under the Chinchilla Planning Scheme, but has not been utilised for agricultural purposes. The development of a substation will therefore not reduce the agricultural production capacity of the Project site. Primary industry is the economic base of the Western Downs economy and any reduction in the provision of GQAL will adversely affect the economy. The long term reduction in the quantity of GQAL may be caused by the emerging coal mining and coal-seam gas activities in the Surat Basin.

Whilst there is a high provision of GQAL within the surrounding area, and across the Chinchilla District as a whole, the Project site is not identified as GQAL under the Chinchilla Planning Scheme. The development of a substation on the Project site will therefore not be contributing to a reduction in GQAL within the community.

The Chinchilla Planning Scheme identifies the Biodiversity Planning Assessment areas within the District. These areas have, or potentially have, high conservation values. The Project site is not identified as a Biodiversity Planning Assessment area under the Planning Scheme, nor does it have any other identified conservation values. Therefore the development of a substation on the Project site will not have any costs on the provision of area of high conservation values within the surrounding area.

The long term greenhouse gas emissions from operation of the plant are expected to be minimal, with the potential that operations may be integrated into existing maintenance regimes for the local plant so not to increase overall travel requirements. Furthermore, it is anticipated that any emissions from this project phase would be potentially offset by the increased efficiency of electricity supply and lower distribution losses.

As previously stated, the development of a substation on the Project site may generate long term, permanent employment opportunities for the operation of the substation however it is more likely that the existing employees associated with the Kogan Creek Power Station will maintain the ongoing operation of the proposed facility. The development of additional energy infrastructure within the region will increase the economic capacity of the region as a whole. A substation development of the Project site, in correlation with the existing Kogan Creek Power Station and Coal Mine on Banana Bridge Road, will increase an already existing energy industry precinct in the surrounding area.

The actual economic contribution that the proposed substation will make to the local and regional economy needs to be quantified and will be included in the final report, following consultation and discussion with Powerlink regarding the function of the proposed substation.

21.4 POTENTIAL IMPACTS

The development of a substation on the Project site is considered to have minimal short term and long term environmental impacts both on the Project site itself and within the surrounding area.

The Project site has not been identified as GQAL nor has it been identified as having or potentially having a high conservation value. The anticipated environmental impacts associated with the proposed substation development are predominantly short term and are related to the anticipated increase in greenhouse gas emissions which equate to an estimated 2,534 tCO₂^e as a result of the required construction activity.

The economic benefits related to the construction of the proposed substation facility will be the employment generated throughout the construction period (estimated to be between 20 to 30 jobs) and potentially additional long term employment opportunities. The completed substation will add to the existing energy related infrastructure in the region and increase the region's overall economic value.

21.5 CONCLUSION

The development of a substation on the Project site is considered to have minimal short term and long term environmental impacts both on the Project site itself and within the surrounding area. There will be an increase in greenhouse gases of approximately 2,534 tCO₂^e as a result of the required construction activity at the Project site.

The short term economic benefit related to the proposed substation facility will be an estimated 20 to 30 construction related jobs at the Project site. The long term economic benefits will be potentially additional employment related to the ongoing maintenance and operation of the substation facility and an increase in the overall economic value of the region as a result of the operation and industry output of the substation facility.

22.0 POWERLINK ENVIRONMENTAL PERFORMANCE

Powerlink is committed to responsible environmental management as an integral part of our business activities. This commitment includes the maintenance and implementation of an Environmental Management System that takes a structured approach to managing the environmental aspects of the business, including but not limited to areas such as construction, maintenance, land management and substations.

Powerlink strongly encourages ownership of environmental care among our workforce by providing training and support, including involvement and encouragement for operational excellence in environment from the executive levels of the business. Innovation and excellence in environmental care by our people is recognised and rewarded.

Powerlink has a strong history of environmental performance across the business and is committed to continuous improvement in our environmental care to ensure that we continue to address the changing expectations of our own people, our stakeholders, the general community and changing legislative requirements.

22.1 POWERLINK ENVIRONMENTAL POLICY

Powerlink is responsible for the operation, maintenance and development of the high voltage transmission network in Queensland. We are committed to responsible environmental management as an integral part of our business activities. We demonstrate that commitment by:

- Consulting openly, honestly and proactively with the community and statutory authorities on the potential environmental impacts of our plans and activities. We are responsive to constructive suggestions to eliminate or minimise potentially adverse impacts;
- Recognising that environmental factors such as land use, public health and safety, noise and visual impact, protection of flora and fauna, environmentally hazardous materials management and waste management are all environmental aspects of our business;
- Maintaining a structured approach to managing our environmental aspects by implementing an Environmental Management System;
- Seeking continual improvement in the environmental performance of our operations;
- Complying with relevant environmental legislation; and
- Building and encouraging ownership of environmental care among our people by providing training and support.

22.2 RECENT PROJECT PERFORMANCE

Powerlink has demonstrated commitment to environmental management during the asset development phase, through undertaking route selection studies, Environmental Impact Assessments and the integration and monitoring of environmental requirements and performance during the construction of Powerlink assets. Recent construction project environmental management includes:

- Millmerran to Middle Ridge 275kV transmission line. This project demonstrated a high level of environmental management performance during construction, including compliance with legislative requirements, integrated stakeholder liaison, and management of interaction with species of national significance subject to referral under the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC).
- Tully to Innisfail 275/132kV transmission line. This Project has been planned and designed to minimise environmental impacts in tropical north Queensland. Due to potential interactions with nationally significant species, this project was also subject to a referral under the EPBC Act. This project was selected randomly by the Department of Environment and Water Resources to be audited against referral conditions. Generally a high level of compliance was noted throughout the project.
- Middle Ridge to Greenbank 275kV transmission line. This project has demonstrated a sound to high level of environmental management performance during construction. Powerlink has in place financial incentive processes for construction contractor environmental performance against the Environmental Management Plan. Environmental performance of the construction activities is monitored by the construction contractor and Powerlink, and actions taken to address identified areas of potential or actual non-conformance with the Environmental Management Plan or legislative requirements.
- Belmont to Murarrie 275kV transmission line. This project has demonstrated a high level of environmental management performance during construction, including compliance with legislative requirements, integrated stakeholder liaison, and working with community groups to improve biological diversity and habitat for native fauna. An example of the habitat enhancement works, Powerlink installed around 80 habitat boxes in trees within Minniipi parklands as homes for the Squirrel Gliders and other animals prevalent in the area, including lorikeets, kookaburras, kingfishers, owls, possums and bats. Monitoring of the habitat boxes following the construction of the Belmont to Murarrie 275kV transmission line showed just how successful this simple yet effective environmental initiative was, with a 90% usage rate within just a few months.

22.3 GREENHOUSE CHALLENGE PLUS

Powerlink Queensland has been a signatory to the Greenhouse Challenge Plus (formally the Greenhouse Challenge) since 1999 and successfully continues to report on a variety of emission generating sources. Powerlink's inventory consists of industrial processes (fugitive emissions), stationary energy, transport energy and wastes. Continued efforts are undertaken to decrease greenhouse emissions from Powerlink's transmission and company assets including the adoption of energy efficient technologies, regular recycling, reducing input resources and exploring emission offsets. Additionally, ongoing innovation and technical design knowledge is promoted and applied throughout the organisation.

22.4 ENVIRONMENTAL RESEARCH

Powerlink demonstrates commitment to environmental management of activities through the whole of the life cycle of Powerlink's assets through commissioning and undertaking research that both directly and indirectly relates to Powerlink activities. Research presently funded by Powerlink includes:

- Investigations into arboreal species movement across easements;
- Investigations into nest box adoption by arboreal species;
- Direct Seeding Trials in Southern, Central and Northern Queensland;
- Weed Seed Destruction and Mobile Cleandown Investigations;
- Selection of Native Ground Cover Species for Revegetation under High Voltage Power Lines;
- Edge effects on natural systems within Queensland's protected area estate; and
- Investigations into the potential impacts from transmission lines on endangered frog species in the Tully-Innisfail area, with particular interest in the potentially fatal fungus chytridiomycosis.

Powerlink has previously funded research in areas such as:

- Internal fragmentation in the rainforest: edge effects of highways, powerlines and watercourses on tropical rainforest understorey microclimate, vegetation structure and composition, physical disturbance and seedling regeneration. C.L.Pohlman 2006 (PhD thesis – James Cook University); and
- Impact of roads and powerline clearings on rainforest vertebrates with emphasis on ground-dwelling small mammals. M.W.Goosem 2000 (PhD thesis – James Cook University).

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APPENDIX A DRAFT TERMS OF REFERENCE

TERMS OF REFERENCE FOR THE ENVIRONMENTAL ASSESSMENT OF A PROPOSED SUBSTATION
INFRASTRUCTURE DEVELOPMENT

It is intended that the proponent will seek Ministerial Designation of the development as Community Infrastructure, under the *Integrated Planning Act 1997*.

These Terms of Reference are adapted from the DLGP "Generic Terms of Reference for an Environmental Impact Statement" published in March 2007.

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It is suggested that as far as practical the EIS should follow the same format as the suggested TOR.

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Attachment 2 – Final TOR

Attachment 3 – Corridor or Substation Site or Communication Site Selection Report/s, if applicable.

Attachment 4 – Development Approvals

Attachment 5 – Study Team

Attachment 6 – Consultation Report

Attachment 7 - Final EIS attachments

PREFACE

The first step in the impact assessment process is the development of Terms of Reference (TOR) for the preparation of an EIS. The process involves the formulation of draft TOR which will be made available to appropriate stakeholders and agencies through targeted consultation. The Consultant will finalise the TOR which will be presented to Powerlink.

The Consultant will prepare a Draft EIS that addresses the TOR. Once the EIS has been prepared to the satisfaction of Powerlink, the Consultant will advertise that the Draft EIS is now available for public comment. At the conclusion of the submission period, the Consultant will hand to Powerlink the Final EIS and recommend a Final substation site.

Upon finalisation of the EIS and Powerlink's approval of the Final substation site, Powerlink will follow the Department of Local Government, Planning, Sport and Recreation "Guidelines about Environmental Assessment and Public Consultation Procedures for Designating Land for Community Infrastructure, Powerlink Manual" starting at Step 4 and commence the designation process. After publicly advertising Powerlink's intention to designate the project and calling for submissions, Powerlink will prepare an Assessment Report evaluating the EIS and other related material, including any properly made submissions received. The Final Assessment Report will include an evaluation of the environmental effects of the proposed development and any related matters and will be forwarded to the Minister for Energy for his / her decision.

Not all sections within the Terms of Reference will be relevant for each project and only the relevant sections should be expanded upon within the EIS. If a section is not relevant, the Terms of Reference will be marked as "not relevant to this project" and the section in the EIS will also state that "this section is not relevant for this project". For further inquiries about the EIS Process in general or for a specific project, please contact:

CONICS

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Unless specified otherwise, the term environment in these TOR refers to:

- (a) Ecosystems and their constituent parts, including people and communities;
- (b) All natural and physical resources;
- (c) Those qualities and characteristics of locations, places and areas, however large or small, that contribute to their biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community;
- (d) The social, economic, aesthetic and cultural conditions affecting the matters mentioned in paragraphs (a), (b) and (c) or affected by those matters.

1. INTRODUCTION

1.1 Project Proponent

The Project Proponent is:

Powerlink Queensland
33 Harold Street, Virginia,
PO Box 1193, Virginia, Queensland 4014, Australia
Telephone: (07) 3860 2111, Facsimile: (07) 3860 2100
Website: www.powerlink.com.au

Powerlink Queensland is the registered business name of the Queensland Electricity Transmission Corporation Limited, ABN 82 078 849 233.

1.2 Project Description

Provide a brief description of the project and its location.

1.3 Objectives and Key Issues of the EIS

1.3.1 Objectives of the EIS

The objectives of the EIS are as follows:

- A description of the relevant aspects of the existing social, economic, natural and built environment;
- To provide information on the proposal and development process to the community and decision makers;
- To comprehensively identify and evaluate all relevant issues associated with the proposal;
- To identify all potential environmental impacts (across the short, medium and longer term) of the development;
- To recommend construction, operational, maintenance and decommissioning measures required to minimise or compensate for adverse impacts and enhanced benefits;
- To consult with the community and relevant stakeholders in the process of identifying, assessing and responding to the impacts of the proposal;
- To identify all necessary licences, planning and environmental approvals including approval requirements pursuant to the Environment Protection and Biodiversity Conservation Act 1999, Integrated Planning Act 1997, Environmental Protection Act 1994, Vegetation Management Act 1999 and other legislation;
- To provide recommendations on the need for and contents of any environmental management plans and / or operational plans to mitigate adverse effects; and
- To provide an input to the decision-making process, assisting with the determination of whether to accept or modify the proposal, approve it with conditions or carry out further studies.

1.3.2 EIS Key Issues

The level of analysis and detail in the EIS shall reflect the level of significance of the impacts. Any and all unknown variables or assumptions made in the assessment must be clearly stated and discussed.

The extent to which the limitations, if any, of available Information may influence the conclusions of the environmental assessment should be discussed. The emphasis shall be on quality and not quantity. Repetition should be avoided wherever possible.

Additional consultation shall be undertaken with other stakeholders, such as property owners and special interest groups, identified through the EIS development process. The EIS is the principal means of ensuring that ecologically sustainable principles are applied in the decision-making process, therefore the EIS shall detail the proposed mitigation measures required to minimise any adverse impact of the proposal and measures to ensure the Project provides the lowest overall environmental, social and economic impacts possible.

When some impacts are not quantifiable, they should be fully described. Safeguards and mitigation measures to ameliorate the impacts, where applicable, should be proposed together with an objective assessment of their effectiveness. Proposals for monitoring of impacts should also be included where appropriate.

A concluding statement at the end of each section of the EIS shall advise if, in the opinion of the consultant, there are any identified reasons why the project should or should not proceed on the chosen Study Area.

The issues to be addressed as part of the EIS can be divided into the following categories:

- Project justification and feasible alternatives;
- Detailed project description; and
- Description of environmental values and management of impacts including mitigation measures, if any.

The EIS will be required to consider in detail relevant issues under each category. In addition, it is essential that the main text of the EIS should address all relevant matters concerning environmental values, impacts on those values and proposed mitigation measures. No relevant matter should be raised for the first time in an appendix or the draft EMP. Other matters that may have to be addressed include those matters covered by the Federal EPBC Act.

If there is a necessity to make use of material that is considered to be of a confidential nature, the Consultant may request that such information remain confidential and not be included in any publicly available document.

The reader should be able to distinguish the EIS as the key environmental document providing advice to decision makers considering approvals for the project.

While the TOR provides guidance on the scope of the EIS studies, it should not be seen as exhaustive or limiting. It is important for Powerlink and its consultants to recognise that there cannot be perfect knowledge in advance of undertaking an EIS or what the EIS studies may find.

If it transpires during the preparation of the EIS that previously unforeseen matters not addressed in the TOR are found to be relevant to the assessment of impacts of the proposal, those matters should be included in the EIS.

When considering whether an impact is or is not significant, the Consultant should take account of both the intensity of the impact and the context in which it would occur.

The EIS is a public document. Its purpose is not only to provide information to regulatory agencies, but also to inform the public of the scope, impacts and mitigation measures of the proposal. Additional technical detail may be provided in appendices. The main text should not assume that a reader would have a prior knowledge of the project. It should not be necessary for the reader to have visited the area to understand the issues involved in the proposal.

In brief, the EIS objectives should be to provide public information on the need for and likely effects of the project, to set out acceptable standards and levels of impacts (both beneficial and adverse) on environmental values, and demonstrate how environmental impacts can be managed through the protection and enhancement of the environmental values. Discussion of options and alternatives and their likely relative environmental management outcomes is a key aspect of the EIS.

The role of the EIS in providing the project's draft EMP should also be discussed, with particular reference to the EMP's role in providing management measures that can be carried over into conditions that would attach to any approval(s), environmental authorities and permits for the project.

1.4 Cross-reference with the EIS

The EIS and the final TOR are to be cross-referenced to ensure that all the relevant issues have been addressed. A summary cross-referencing specific items of the final TOR to the relevant section of the EIS is to be provided. For this reason, it is suggested that as far as practical the EIS should follow the same format as the TOR.

2 PROJECT JUSTIFICATION AND FEASIBLE ALTERNATIVES

2.1 Project Justification

The justification for the project should be described, with particular reference made to the economic and social benefits. The status of the project should be discussed in a regional, State and National context. *

* Powerlink to provide details when issuing a specific project brief

2.2 Feasible Alternatives

This section should describe feasible alternatives, including conceptual, technological and locality alternatives to the project, and discussion of the consequences of not proceeding with the project. Alternatives should be discussed in sufficient detail to enable an understanding of the reasons for preferring certain options and courses of action and rejecting others. Comparative environmental impacts of each alternative should be summarized.

Reasons for selecting the preferred options should include technical, commercial, social and natural environment aspects. In particular, the principals of ecological sustainable development (ESD) and sustainable development should be included. This information is required to assess why the scope of the proposal is as it is and to ensure that the ESD principles and sustainable development aspects have been considered and incorporated during the scoping and planning of the proposal.

3. PROJECT DESCRIPTION

The objective of this section is to describe the project through its lifetime of design, construction, operation and decommissioning. This information is required to allow assessment of all aspects of a proposal including all phases of the proposal. It also allows further assessment of which approvals may be required and how they may be managed through the life of the proposal.

Describe:

- Any existing easements, new easement requirements or land that may need to be purchased;
- The location and type of buildings or structures that may be impacted by the proposal; and
- Construction and maintenance access requirements, including wet weather access.

The various elements of the project should be described in the text and illustrated with maps and diagrams, as required.

3.1 Location Details

Provide an overall locality plan of the Study Area within a State or regional context together with a general description of land uses and the nature of the land affected by the proposed development.

3.2 Physical Details of Structures

Describe the typical form, physical dimensions and construction materials of the structures, insulators, conductors, buildings, transformer bays, busbars, SVCs etc., as appropriate, proposed for the project. Include:

- The approximate location and details of any transposition or transition structures proposed for the development; and
- Structure details and proposed layouts of any infrastructure likely to be associated with access tracks.

3.3 Construction, Maintenance and Decommissioning Activities

Describe:

- Construction stages and equipment used, including anticipated workforce levels;
- Activities relating to the inspection, operation, maintenance and decommissioning of the development including how frequently the operational and maintenance activities would be required, including the provision for regrowth and weed control; and
- The surrender, if any, of the underlying easements.

3.4 Infrastructure Requirements

This section should provide descriptions of any infrastructure that is likely to be impacted by the construction, operation, maintenance and decommissioning of the project. The matters to be considered include such infrastructure as roads, rail, dams and weirs, other power lines and other cables and pipelines for any services (whether underground or above) and telecommunications.

This section should provide descriptions of any infrastructure that is likely to be impacted by the construction, operation, maintenance and decommissioning of the substation site with concept and layout plans, if any, of requirements for constructing, upgrading or relocating all infrastructure in the vicinity of the project area. The matters to be considered include, if any, such infrastructure as roads, other power lines and other cables, wireless technology (e.g. microwave telecommunications), and pipelines for any services (whether underground or above).

The location and owner / custodians of all tenures, reserves, roads and road reserves, railways and rail reserves, stock routes and the like, marine infrastructure covering the affected and adjacent land should be shown on maps of a suitable scale. Indicate locations of gas and water pipelines, power lines and any other easements. Describe the environmental values affected by this infrastructure. In particular, any adverse impacts associated with vegetation clearing for vehicular access and services requirements should be identified.

3.4.1 *Energy*

The EIS should describe electricity requirements, for the construction and operation phases of the project. The locations of any easements for existing powerlines should be shown on the infrastructure plan.

3.4.2 *Water Supply and Storage*

The EIS should provide information on water usage by the project, including the quality and quantity of all water to be supplied to and discharged from the site from the various sources and the reliability of those sources. In particular, the proposed and optional sources of water supply should be described.

Determination of potable water demand should be made for the project, including the temporary demands during the construction period. If water storage and / or treatment is proposed on site, for use by the site workforce, then this should be described.

The potential for demands for off-site water, if on-site shortfalls occur, should be considered, along with any subsequent impacts on existing off-site water infrastructure.

3.4.3 *Stormwater Drainage*

A description should be provided of the proposed stormwater drainage system and the proposed disposal arrangements, including any off-site services. A Stormwater Management Plan should be prepared for the site.

3.4.4 Sewerage

This section should describe, in general terms, the sewerage infrastructure required by the project. Information is required on any on site treatment.

3.4.5 Telecommunications

The EIS should describe the telecommunications requirement of the project where telecommunications sites will be developed and the proposed tenure.

Describe any impacts on existing telecommunications infrastructure (such as optical cables, microwave towers, etc.) and identify the owners of that infrastructure.

4. ENVIRONMENTAL VALUES AND MANAGEMENT OF IMPACTS

The functions of this section are to describe the existing environmental values of the area which may be affected by the proposal, to assess the potential impact of the proposed development on those environmental values, and to develop mitigation measures to minimize those impacts.

When addressing the existing environment describe the physical features of the existing project environment and surrounding areas in sufficient detail to allow the environmental impacts of the proposal to be adequately assessed and to provide a baseline against which predicted and future changes can be measured.

When addressing the potential environmental impacts and mitigation measures, regard should be given to the meaning of “environment” as set out in the Preface. The assessment should include:

- (a) The matters listed in Schedule 2 of the Guidelines (refer Attachment 1);
- (b) Short, long-term and cumulative effects;
- (c) Effects from use and works, during the construction phase, the operational phase and the decommissioning phase of the proposed community infrastructure; and
- (d) On-site and off-site effects. Consideration should be given to the level and type of existing disturbance across the Study Area.

For community infrastructure proposed to be designated well in advance of construction and use, identification and assessment of environmental effects should consider, amongst any other relevant matters, likely changes of use on adjoining and nearby land, and broad parameters of scale, intensity, access and the like.

Paragraphs (a) to (d) are to be specifically addressed in the EIS but only to the extent relevant, including to state that a matter is not relevant. Attachment 1 lists the elements from Schedule 2 of the Guidelines and the specific questions that require answers. The EIS is to address all of these matters and Attachment 1 is to be completed by stating next to the question, either a specific reference where the matter has been discussed within the EIS or state that the matter is not relevant.

Environmental and social factors that need to be considered in the EIS may be grouped for convenience under three headings:

- Physical environment;
- Biological environment;
- Socio-economic environment.

In parallel with or in addition to each of the matters listed in Schedule 2 of the Guidelines, the EIS shall give consideration to each of the matters listed below. In each case, where appropriate, the consideration shall include the environmental value of the matter, the potential impact of the proposed development on that matter and ways in which any adverse effects can be avoided or mitigated. Where appropriate, discussions of each of the matters shall be supported by suitably scaled current mapping illustrating the features and occurrence of the matters under discussion.

4.1 Physical Environment

4.1.1. Land

This section describes the existing environment values of the land area that may be affected by the proposal.

4.1.1.1 Topography / Geomorphology

The topography of the proposal should be detailed with contours at suitable increments, shown with respect to AHD. Significant features of the locality should be included on the maps. Such features would include any locations subsequently referred to in the EIS (e.g. the nearest noise sensitive locations, national or marine parks, sensitive marine ecosystems) that are not included on other maps. Commentary on the maps should be provided highlighting the significant topographical features.

4.1.1.2 Soils and Geology

Provide a description of the geology and geomorphology of the Study Area in sufficient detail to describe the geology of the site in terms of dominant rock types in a regional context. Describe the landforms of the Study Area and surrounding areas including slope and terrain components and an analysis of subsurface and slope stability. Any interesting geomorphological or geological unique features and any associated biological importance shall be described. Describe soil analysis including stability, erodability, contaminants, acid sulphate soils, sodic soils or saline soils and revegetation potential. Describe any likely impacts on soil erosion, siltation, major earth slippage / movement, soil contamination risk and sulfate and saline soils risk.

Describe any known mineral deposits, mines or quarries of commercial significance, including any registered exploration permits within or immediately adjacent to the Study Area. Describe the extent, if any, of any mining tenements with suitable mapping along or adjacent to the Study Area.

4.1.1.3 Land Contamination

The EIS should describe the possible contamination of land from aspects of the project including waste, acid generation from exposed sulfidic material and spills at chemical and fuel storage areas.

The means of preventing land contamination (within the meaning of the *Queensland Environmental Protection Act 1994*) should be addressed. Methods proposed for preventing, recording, containing and

remediating any contaminated land should be outlined. Intentions should be stated concerning the classification (in terms of the Queensland Contaminated Land Register) of land contamination.

A Preliminary Site Investigation (PSI) of the site consistent with the EPA's "Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland" should be undertaken to determine background contamination levels. The results of the PSI should be summarised in the EIS and provided in detail in an appendix.

If the results of the preliminary site investigation indicate potential or actual contamination, a detailed site investigation progressively managed in accordance with the stages outlined in Appendix 5 of the Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland should be undertaken.

The EIS should address management of any existing or potentially contaminated land in addition to preventing and managing land contamination resulting from project activities. The Draft Guidelines for the Assessment and Management of Contaminated Land in Queensland can be downloaded from the EPA website at: www.epa.qld.gov.au/environment/business/contaminated). Proponents should refer study proposals to the EPA for review prior to commencement (consult with the Contaminated Land Section in the Queensland EPA).

4.1.2 Climate and Air Quality

Provide generic details of the existing air quality and the presence of pollutants. Identify atypical meteorological conditions and their likely frequency of occurrence. Provide a description of the climatic features and microclimate of the Study Area (temperature, wind, frost, rainfall, etc.).

In addition, climate change is emerging as an issue of international significance. In Queensland, climate change is expected to have a number of impacts including warmer temperatures, rising sea levels, changes in rainfall patterns, and increased storm and cyclone intensity. Describe in general detail how these effects may impact on the development.

Include any likely impacts on air quality during the construction and operation phases including dust, odours or potential greenhouse gas emissions and how these may affect the surrounding environment including, but not necessarily limited to, residences and ecologically sensitive areas, where applicable.

4.1.3 Hydrology

Describe the hydrology traversed by the Study Area and surrounding areas including surface hydrology and locally important subsurface hydrology including water quality, wetlands, and the frequency and extent of flooding using a desktop assessment. Include an overview of any existing water use adjacent to the proposed development that may be impacted by the proposal.

Describe any likely impacts on groundwater and surface water quality and flow, water contamination risk, flooding potential, surge potential and hydrology, alterations to drainage patterns and crossing of waterways including mitigation measures and their effectiveness. Review Powerlink's authorisation under the *Water Act*

2000 (Authority) for works in waterways and advise of any likely impacts. Quantify such impacts in accordance with the provisions of the Authority and prepare a separate record of all necessary calculations and reports for use by the construction team. Where feasible, describe the potential issue of groundwater interception during the drilling of foundations and the potential need to dewater foundations or any other water pending structures. When addressing the issue of dewatering foundations, include appropriate management controls which address discharge waters and their potential to contain sediment, concrete, slurry or fines, inappropriate pH value (acidic or alkaline) or other environmental pollutants.

4.1.4 Fire

Discuss any likely causes due to construction and maintenance activities of the proposed development. Also indicate any likely impacts on burning for pasture management and / or weed control. Discuss the potential impact of bushfires on the proposed development.

4.1.5 Waste Management

Describe waste management and disposal of materials including oils and lubricants, water, solid waste, vegetative waste and regulated waste.

4.1.5.1 Character and quantities of waste materials

Provide an inventory of all wastes to be generated by the project during the construction and operational phases of the project.

Having regard for best practice waste management strategies and the Environmental Protection (Waste) Policy, the proposals for waste avoidance, reuse, recycling, treatment and disposal should be described in the appropriate sub-section below. Information should also be provided on the variability, composition and generation rates of all waste produced at the site.

4.1.5.2 Solid waste disposal

The proposed location, site suitability, dimensions and volume of any landfill requirements for solid wastes generated by the project.

4.1.5.3 Liquid waste

A description should be presented of the origin, quality and quantity of wastewater originating from the project.

The EIS may need to consider the following effects:

- Rainfall directly onto disturbed surface areas;
- Run-off from hard surfaces (e.g. roads, development footprint);
- Drainage (i.e. run-off plus any seepage or leakage);
- Seepage from other waste storages;
- Water usage for dust suppression; and
- Domestic sewage treatment - disposal of liquid effluent and sludge.

4.2 Biological Environment

4.2.1 Sensitive Environmental Areas

Provide a description of the conservation significance, including wildlife and habitat, of any specific portions of the Study Area affecting sensitive environmental areas. Include reference to World Heritage Areas, RAMSAR wetlands, National Parks, State Forests, Stock Routes and proposed conservation areas as relevant to the proposal and their conservation value.

For sensitive environmental areas, describe the extent, integrity and relative importance of the biological communities of the Study Area and surrounding area. Discuss the relationship of the vegetation to water quality and soil stability. Discuss the conservation significance of the associations and communities of the site and surrounding area, in respect to local, regional and national and international importance. Describe the ecological values of the site, including any refuge habitats, breeding habitats, food chains, and presence of barriers to, and corridors for, wildlife movement.

4.2.2 Flora and Fauna

4.2.2.1 *Flora – Description of Existing Environmental Values*

Provide details of the vegetation across the Study Area including the surrounding area. Describe the methodology used for any flora surveys undertaken. Identify and describe threatened species and communities protected under State or Commonwealth legislation, including Regional Ecosystem (RE) categories where applicable, and the significance of vegetation types or locations to identified native fauna. Include a comparison of site mapping and mapping produced by the Queensland Herbarium under the *Vegetation Management Act 1999* when any differences are identified. Comment on the ecological value of the areas across the Study Area. Any areas where vegetation is considered of high ecological importance should be noted. Investigations should comply with all elements of the assessment code in the State policy for vegetation management where appropriate. Note any species that are identified as under threat on a local or regional scale that may not be recognised under Commonwealth or State Legislation.

Discuss:

- The presence of any presumed extinct, endangered, vulnerable or rare species or endangered or of concern ecosystems, their habitat requirements and sensitivity to changes / disturbances associated with the normal construction and operation of Substation infrastructure;
- The presence of biogeographically significant, unusual or evolutionary significant species, communities or populations; and
- The extent and incidence of exotic species, weeds and diseases. Species of note should include, but not necessarily be limited to, those species recognised under Federal and State legislation (declared and not declared) and recognised by the local Shire Councils. The status and category of any weeds should be noted.

Detail existing occurrence of pest species including weed species identification, prevalence and infestation of pests.

Provide a vegetation map of the Study Area and key flora indicators should be identified for future ongoing monitoring.

4.2.2.2 *Fauna - Description of Existing Environmental Values*

Describe the methodology and findings of fauna surveys and desktop studies, including the aerial, terrestrial and aquatic fauna present or likely to be present in the area or in areas that may be affected by the project, including the existence of endangered, vulnerable or rare species under both Commonwealth and State legislation and the impact of the project on these aspects including:

- Any presumed extinct, endangered, vulnerable or rare species, their habitat requirements and sensitivity to change including any ongoing activities associated with the project;
- Location and importance of wildlife corridors;
- Occurrence or likely seasonal occurrence of migratory species, and presence of suitable habitat for these species;
- The presence of biogeographically significant, unusual or evolutionary significant species or populations;
- Presence of feral animals, their distribution and present level of ecological impact;
- Presence of any significant / notable nests, burrows, hollows etc;
- The presence of any wetlands, wildlife breeding or roosting areas;
- Any significant habitat or relevant bird flight paths for migratory species;
- Bat roosting and breeding caves including existing structures such as adits and shafts; and
- The habitat of threatened animals and communities. Note any species that are identified as under threat on a local or regional scale that may not be recognised under Commonwealth or State Legislation.

The survey intensity and period should be consistent with the difficulty of locating any species listed as rare, vulnerable or endangered under the Nature Conservation (Wildlife) Regulation 1994 or the EPBC Act that potentially occur in the area. Key fauna indicators should be identified for future ongoing monitoring.

4.2.2.3 *Flora and Fauna - Potential Impacts and Mitigation*

Potential Impacts and Mitigation Measures associated with Flora and Fauna should be described under the headings of:

- Pre-construction work including surveys, access, etc.;
- Construction;
- Maintenance; and
- Decommissioning.

and include the matters, where applicable, set out below.

4.2.2.4 *Flora Potential Impacts*

Include any likely direct and indirect impacts on terrestrial and aquatic flora. Attention should be given to any rare, threatened or endangered species, or species of local, regional, State or National Environmental Significance (NES) identified in the surveys and / or desktop study and advise on any Matters of NES that need to be referred to the Commonwealth Department of Environment and Water Resources (DEWR) for a determination as to whether or not it is a Controlled Action under s67 of the EPBC Act.

Discuss the ability of identified vegetation to withstand any increased pressure resulting from the project and the likely impact of the project on the abundance and distribution of exotic species, weeds and diseases.

Discuss clearing requirements including the amount and type of vegetation affected. The proposed methods of disposal of cleared vegetation should be described. The potential use of cleared vegetation for rehabilitation / compensatory habitat, provision of ground level habitat or erosion control (mulch) should be considered. Tabulated data on the Regional Ecosystem (RE), areas likely to be cleared and the clearing methodology applicable to each RE shall be detailed. Include details on whether vegetation is native and its maturity. Reference to the ecological value (as established in the flora investigation) of material to be cleared should be made.

The Queensland *Vegetation Management Act 1999* and the findings of any regional vegetation management plan should also be referenced.

4.2.2.5 *Flora Mitigation Measures*

Measures to mitigate impacts and their adequacy and effectiveness shall be proposed. Measures for ongoing management of the natural environment and prevention of the introduction and spread of pests and weeds using washdown facilities shall also be included. The barrier, fragmentation and edge effects of the Study Area need to be analysed.

Mitigation measures should consider localised clearing constraints such as pruning and allowing for regrowth to restore habitat value and limit erosion, where possible. Other mitigation measures such as compensatory vegetation and tree planting should also be considered where relevant. Long term ecological consequences of compensatory vegetation and the management of that vegetation should also be discussed. Any barrier effect of a cleared corridor on the movement of fauna should also be considered. Elements of the State Policy Assessment Code for tree clearing should be addressed, where applicable. Indicate if any millable timber can be salvaged during the clearing operation.

4.2.2.6 *Fauna Potential Impacts*

Include any likely direct and indirect impacts on aerial, terrestrial, feral and aquatic fauna including migratory species, and any relevant bird flight paths. Attention should be given to any rare, threatened or endangered species, or species and habitats of local, regional, State or NES identified in the surveys and / or desktop study and advise on any Matters of NES that need to be referred to the DEWR for a determination as to whether or not it is a Controlled Action under s67 of the EPBC Act.

Discuss the ability of identified fauna to withstand any increased pressure resulting from the project, including potential barrier, fragmentation and edge effects of the proposed Substation on terrestrial and aquatic habitats. Consideration should be given to the extent and type of disturbance created by other corridors (e.g. roads, rail, access tracks) existing in the area. Include any potential impacts on any apiary industry.

4.2.2.7 Fauna Mitigation Measures

Measures to mitigate impacts, including wildlife corridors and compensatory habitat areas and their adequacy and effectiveness shall be proposed. Measures for ongoing management of the natural environment shall also be included.

4.3 Socio-Economic Environment

4.3.1 Land Use

Describe each existing use on the Study Area and uses adjoining the Study Area. Discuss potential site specific and cumulative impacts of the project on existing and potential land use and developments including farming activities, forestry, tourism and airfield operation. In particular on the operation, management, productivity of developments, likely sterilisation of mineral and significant extractive industry resources and loss of good quality agricultural land. Note how much land of each type / use will be altered, relating this to the amount of land of each type / use currently existing in the area.

4.3.2 Socio-Economic Issues

Include a description of the socio-economic characteristics of the community surrounding the proposed development. Provide an assessment of the potential impacts (real or perceived) of the development of the Study Area.

Detail the matters to be of concern to other parties affected or likely to be affected by the project. Include in the EIS any consultation about the action, including:

- a) Any consultation that has already taken place;
- b) Proposed consultation about relevant impacts of the action;
- c) If there has been consultation about the proposed action, any documented response to, or result of, the consultation; and
- d) Identification of affected parties. Comments from relevant local, State and Commonwealth agencies, service and utility providers, community groups, affected landowners and individuals shall be identified and addressed in the EIS. Include discussion on any feature or areas of local, regional or community concern such as those of recreation, amenity, cultural heritage or conservation value. All consultation shall be documented including any issues raised and how they were considered in finalising the EIS. Provide copies of any documented response to, or submission from the consultation. In conjunction with Powerlink, prepare a draft response to any submission received. Results of consultation shall be included in an Appendix to the EIS. The DLGP Guidelines include a list of the minimum parties to be consulted.

4.3.3 Noise and Vibration

Provide details of any noise sensitive receivers or locations within or near the proposed development and detail their respective distance from the proposed development and, if any, provide details of existing ambient noise levels.

Identify:

- Sources of vibration from the environment that may impact upon the development and comment upon their effect, eg. blasting, movement of heavy traffic on roads or railways, audio and sonic shock from aircraft;
- Parts of the receiving environment that is sensitive to vibration emanating from the development. This vibration typically arises from the use of explosives, movement of heavy vehicles and fly over of aircraft, eg. helicopters; and
- Audible noise emanating from equipment forming parts of the development and wind noise associated with the conductors and towers and corona noise on the proposed development.

Based on the vicinity of residences / human habitation, assess any increase in background and incidental noise levels at noise-sensitive locations, particularly during construction and operational phases.

4.3.4 Electric and Magnetic Fields

Assess potential impacts of electric and magnetic fields on fauna, agriculture, TV reception, radio, on the quality of telephone and mobile communications, as well as navigational instruments and adjacent conductive materials. Also, based on the vicinity of residences / human habitation, assess the potential risk of electric and magnetic fields from the proposed substation on adult and child health, including identification of the potential hazards, transient and prolonged exposure, epidemiological studies, etc.

4.3.5 Landscape Character

4.3.5.1 *Landscape*

Describe in general terms the existing character of the landscape that will be affected by the proposal. It should comment on any changes that have already been made to the natural landscape since European settlement. It should 'set the scene' for the description of particular scenic values in the following section on visual amenity. The difference between the two sections is that this section describes the general impression of the landscape that would be obtained while travelling through and around it, while the visual amenity section addresses particular panoramas and views (e.g. from constructed lookouts, designated scenic routes, etc.) that have amenity value.

Describe the potential impacts of the project landscape character of the site and the surrounding area. Particular mention should be made of any changes to the broad-scale topography and vegetation character of the area, such as due to spoil dumps, excavated voids and broad-scale clearing. Details should be provided of measures to be undertaken to mitigate or avoid the identified impacts.

4.3.5.2 *Visual Amenity*

Describe existing landscape features, panoramas and views that have, or could be expected to have, value to the community whether of local or regional significance.

Evaluate local and regional visual impacts of the major structures, access tracks and easement clearance. Include potential impacts on the users of State-controlled roads.

Describe the aesthetic and landscape values of the Study Area and other features contributing to the amenity including landforms, visual character, resident populations within the viewshed, buildings, structures or other facilities of particular cultural, historic, religious or social importance.

Sketches, diagrams, computer imaging and photos may be used where possible to portray the near views and far views of the completed development and their surroundings from visually sensitive locations.

4.3.6 Transport Infrastructure, Traffic and Amenity

Describe:

- The existing transport infrastructure including a description of the existing aerodromes, road networks including highways and State controlled roads expected to be used to transport freight to the project, road surface types and estimated traffic flows making reference to the Regional Transport Plans, as appropriate;
- The rail network (including the volume of traffic on any rail line) and a description of where, if any, the Study Area will cross the rail corridor; and
- Arrangements for the transport of plant, equipment, products, wastes and personnel during both the construction phase and operational phase of the project. The description should address the use of existing facilities and all requirements for the construction, upgrading or relocation of any transport related infrastructure.

Information should be provided on road transportation requirements on public roads for both construction and operations phases, including:

- Proposed road access to the project, including wet weather access if different from normal access;
- The estimated volume, composition (types and quantities) of, origin and destination of goods to be moved including construction materials, plant, raw materials, wastes, hazardous materials;
- The volume of traffic generated by workforce personnel, visitors and service vehicles and materials to be delivered to the project; and
- Anticipated times at which movements may occur.

Assess:

- Any impact on local aircraft flight paths including commercial flights, agricultural flights such as crop-dusting, tourist flights such as parachuting and balloon flights as well as emergency flights;
- Potential impacts on road and rail, if any, traffic and community amenity especially during the construction phase of the proposal. Include an assessment of the impacts where vehicles will access State-controlled roads and how road safety and traffic efficiency will be maintained; and

- The ongoing impact on existing and new road and access track infrastructure associated with improved access to various recreational vehicles including any necessary management requirements.

Information should be provided on road transportation requirements on public roads for both construction and operations phases, including:

- Proposed road access to the development;
- The volume of traffic generated by workforce personnel, visitors and service vehicles;
- Method of movement (including vehicle types and number of vehicles likely to be used);
- Anticipated times at which movements may occur;
- Details of vehicle traffic and transport of heavy and oversize indivisible loads (including types and composition);
- Need for increased road (and waterway crossing) maintenance and upgrading;
- Proposed methods and procedures to maintain acceptable EPA and community standards in relation to dust and exhaust emissions; and
- Communication of these issues to the public.

4.3.7 Non-Indigenous Cultural Heritage

The impact of the proposed development on non-indigenous cultural heritage shall be determined in the assessment.

Local and regional historical societies should be contacted to determine sites of significant heritage value. Advise if any place on or adjacent to the Study area is entered in the heritage register under the *Queensland Heritage Act 1992*.

Activities should include:

- Review of literature to identify relevant archaeological, anthropological, natural, historical and other non-indigenous cultural heritage data pertaining to the area impacted by the proposed development;
- Consultation of relevant non-indigenous cultural heritage site registers and databases including the Register of National Estates and the Queensland Heritage Register to compile a list of significant non-indigenous sites and places previously recorded in the area impacted by the proposed development;
- Consult locally for information on any areas / items considered of cultural heritage significance by local and regional stakeholders.

Determine the potential impact of the Substation with consideration of issues including lifestyle, heritage places, and other places frequently visited or used.

4.3.8 Aboriginal Cultural Heritage

Powerlink will consider the impact of the proposed activities on Aboriginal Cultural heritage and where appropriate will enter into an agreement with the relevant Aboriginal parties to protect or minimise the harm to Aboriginal Cultural Heritage affected by the project. Powerlink will provide the Consultant with confirmation of the steps taken to manage Aboriginal Cultural Heritage for inclusion in the EIS.

5. TOWN PLANNING AND LEGISLATIVE REQUIREMENTS

This section addresses the requirements of the IPA in relation to development approval for a Substation development. The description of the proposed Substation should be sufficient to identify the land involved, and the description of the infrastructure should be general in nature and should not include the technical details of individual structures. The following items should be addressed under the proposed headings:

5.1 Description of Each Relevant Planning Scheme

Describe any special attributes affecting the Study Area that are identified on each relevant Planning Scheme, together with any consistencies or otherwise with the Scheme(s). A conclusion is required at the end of each comparison stating how the Substation will affect a Planning Scheme or how the proposed development complies with the intent of the Planning Scheme.

5.2 Outcomes Summary

Include a summary of the intentions or outcomes sought for uses and works on the Study Area and in the surrounding area in each relevant Planning Scheme.

5.3 Description of Each State Planning Policy (SPP)

A description of any special attributes affecting the Study Area that are identified in a State Planning Policy and include a statement about the consistency with any relevant SPP.

A conclusion is required at the end of each SPP stating whether the Substation will affect a SPP or how the proposed development complies with the intent of the SPP.

5.4 Effect on Regional Plan or Master Plan, If Any

A description of any special attributes affecting the proposed development that are identified in any regional plan, where not identified as adequately reflected in the relevant Planning Scheme. Include a statement about the consistency with any regional plan where not identified as adequately reflected in the relevant Planning Scheme.

Describe any special attributes affecting the declared urban development master plan for the area, and comment on whether, or not, the proposed development will impact on the declared or a proposed master plan.

5.5 Description of Nature, Scale and Intensity

A description of the nature, scale and intensity of each use proposed as part of the community infrastructure.

6. ENVIRONMENTAL MANAGEMENT PLAN

The Draft EIS will contain a draft Environmental Management Plan (EMP) covering the life cycle of the proposed development. The plan should contain all relevant details available at the time when the EIS is prepared. When information is not available, they should be described with an indication of how and when the information will be incorporated into the final detailed EMP. When developing the EMP, any relevant impacts identified during the EIS process should be considered and a consolidated list of mitigation measures proposed to be undertaken to prevent, minimise or compensate for the relevant impacts of the action.

The plan should address, but not be limited to, the following matters:

- Key Performance Objectives;
- Management Strategy; and
- Performance Indicators

On the following criteria, if applicable:

SECTION NUMBER	HEADING	INCLUDES
4.1	PHYSICAL ENVIRONMENT	
4.1.1	Land	Topography, minerals, Contamination and erosion
4.1.2	Climate and Air Quality	
4.1.3	Hydrology	
4.1.4	Fire	
4.1.5	Waste Management	
4.2	BIOLOGICAL ENVIRONMENT	
4.2.1	Sensitive Environmental Areas	National parks and protected areas
4.2.2	Coastal Environment	
4.2.3	Flora and Fauna	Flora and fauna and pest and weed control, fire ant area, Wet Tropics Management Area
4.3	SOCIO-ECONOMIC ENVIRONMENT	
4.3.1	Land Use	
4.3.2	Socio-Economic Issues	
4.3.3	Noise and Vibration	
4.3.4	Health and Safety	Safety and EMF (Induction effects and health concerns)
4.3.5	Landscape Character	Landscape and Visual Amenity
4.3.6	Transport Infrastructure, Traffic and Amenity	Access, hazardous materials / substances
4.3.7	Non-Indigenous Cultural Heritage	
4.3.8	Aboriginal Cultural Heritage	Reference to CHMP

7. OTHER APPROVALS AND CONDITIONS

The Final EIS will be used by Powerlink to support an application for Community infrastructure Ministerial designation under the IPA.

The information is required to assess how the legislation applies to the project and which agencies have jurisdiction. This section should explain the legislation and policies controlling the approvals process. Any requirements of the EPBC Act should also be included.

The EIS should also include a statement identifying what assessment requirements apply to the proposed community infrastructure under State legislation. Reference should be made to the IPA (for both assessment under the IPA integrated development assessment system (IDAS) and outside that system) any other relevant Queensland legislation and approval processes. Local Government planning controls, local laws and policies applying to the development should be described.

Therefore the following headings can be used:

7.1 Federal Legislation

Detail the requirements of relevant Federal legislation including the roles of Government Agencies. Describe any approval that has been obtained from a Commonwealth agency or authority, including any conditions that apply to the action. Include any other requirements for approvals or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action.

Describe the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.

7.2 State Legislation and Permit Requirements

The IPA, schedule 8 and the Integrated Planning Regulation 1998, in particular Schedule 10 (State Resources), identify State assessment requirements under the IPA and the report should include any permits required to be obtained by Powerlink and associated requirements, such as resource entitlement / allocation, based on the Project. Attachment 1 includes a column requesting information on permit requirements. If any other permits are required other than the information requested in Attachment 1, then include those permit requirements under this section.

Describe any approval or exemption that has been obtained from a State agency or authority, including any conditions that apply to the action. Reference should be made to any other requirements for approvals or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action.

Describe the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.

7.3 Local Government Planning, Ordinances and By-Laws

Detail the relevant local government planning and land use requirements of the relevant City or Shire Councils including local ordinances and by-laws such as local vegetation laws. A list should be provided of the approvals required for the project and the expected program for approval of applications.

Include also any potential conflict with Planning Scheme measures including strategic plans, any development control plans and the intent of the zones within which the proposed development is located.

8. ENVIRONMENTAL COST-BENEFIT SUMMARY

The summary shall include both the short and long term environmental costs and benefits to be borne by the community and the environment, such as reduced productivity on land impacted by the development, quantity of good agricultural land affected, areas of high conservation values affected, and reduction in greenhouse gas emissions. It should include an analysis of options for traversing State-controlled road reserves based on ultimate concept plans. Where costs / benefits are not quantifiable, they should be described.

9. POWERLINK'S ENVIRONMENTAL RECORD

The EIS shall detail: *

- Any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against Powerlink; and
- Powerlink's environmental record including reference to its environmental policy and planning framework. Specific reference should be made to the environmental performance of the past three projects of similar nature and structure to that proposed.

*Powerlink will supply this information with the specific project brief.

10 REFERENCES

All references consulted should be presented in the EIS in a recognised format.

Recommended appendices

A1 – Schedule 2 of the DLGP Guidelines

A2. Final Terms of Reference for this EIS

A copy of the final TOR should be included in the EIS. Where it is intended to bind appendices in a separate volume from the main body of the EIS, the TOR at least should be bound with the main body of the EIS for ease of cross-referencing. A summary, cross-referencing specific items of the TOR to the relevant section of the EIS, should also be provided in Section 1.4 of the EIS. For this purpose the TOR should be line numbered.

A3. Corridor Selection Report

If applicable, a copy of the Corridor Selection Report and / or Substation Site Selection Report should be included.

A4. Development Approvals

A list of the development approvals required by the project should be presented (in the expected sequencing of applications) along with their corresponding regulating legislation and the approving authority. – refer A1

A5. Study Team

The qualifications and experience of the study team and specialist sub-consultants and expert reviewers should be provided.

A6. Consultation Report

The summary Consultation Report appendix for an EIS should commence by including the details of affected and interested persons by type or organisation, and the statement of planned consultation with those persons, originally provided with the draft Terms of Reference. It should describe how 'interested' and 'affected persons,' and any 'affected parties' as defined by the EPBC Act were identified and include the matters likely to be of concern to other parties affected or likely to be affected by the development for the proposed community infrastructure.

A7. The Final EIS should include the following:

- (a) A list of the parties consulted (subject to their permission);
- (b) A copy of newspaper tear-sheet of Draft EIS advertisements;
- (c) A summary of all submissions and the account taken of the issues raised;
- (d) Any further assessment of environmental effects of the project;
- (e) Any additional strategies for managing the environmental effects;
- (f) A statement of any matters proposed to be included in the designation under the IPA, s2.6.4; and
- (g) Any recommended changes to the Substation which produces the Final Layout.

APPENDIX B DESIGNATION CHECKLIST

ATTACHMENT 1 – to be submitted with draft EIS
Adapted from SCHEDULE 2 OF DLGP Guidelines

****If a matter is not relevant, state that the matter is not relevant. If the item is also covered by a SPP, refer to the paragraph number that covers that particular SPP. Reference should be made to the actual Schedule 2 of the DLGP Guidelines which lists relevant public sector entities and local governments as sources of advice and information on the range of listed matters.**

MATTER		YES/NO	SECTION
1. Soils and geology			
1.1	Is the proposed community infrastructure compatible with the geology and topography of the Study Area?	Yes.	5.2
1.2	Does the Study Area have acid sulfate soils or potential acid sulfate soils?	No.	5.3.1.4
1.3	Does any part of the Study Area have erosion potential or does the Study Area have potential hillslope stability problems?	Yes.	5.3.1.3 5.3.2.2
1.4	Is the Study Area subject to salinity or soil degradation?	No.	5.3.1.3
	Is any part of the Study Area subject to an approved project plan for soil conservation under the <i>Soil Conservation Act 1986</i> ?	No.	5.3.1.3
2. Natural resources			
2.1	Does the Study Area include land identified as good quality agricultural land, or is the Study Area adjacent to agricultural areas?	No.	5.3.1.5
	If so, will the proposal be compatible with agricultural activities?	No.	5.3.1.5
2.2	Are there fisheries habitats or fish habitat areas located on or adjacent to the Study Area? (IPA, schedule 8 applies)	No.	-
2.3	Will the proposal require the removal, destruction or damage of marine plants? (IPA, schedule 8 applies)	No.	-
2.4	Will the proposed community infrastructure involve the construction of waterway barrier works in waterways, or require the construction of a fish way? (IPA, schedule 8 applies)	No.	-
2.5	Will the proposed community infrastructure involve taking, using or interfering with the flow of water on, under or adjoining any part of the Study Area? (IPA, schedule 8 applies)	No.	-
2.6	Is the Study Area located in or adjacent to a State forest or timber reserve under the Forestry Act 1959?	No.	-

MATTER		YES/NO	SECTION
2.7	Does the proposed community infrastructure include vegetation clearing not covered by 2.8 below? (IPA, schedule 8 applies)	Yes.	10.3.1
2.8	Does the proposal include clearing native vegetation in: (a) a forest reserve or protected area under the <i>Nature Conservation Act 1992</i> ; or (b) a State forest or timber reserve under the <i>Forestry Act 1959</i> ? (IPA, schedule 8 applies)	No. No.	- -
2.9	Does the Study Area include or is it adjacent to any identified mineral, oil, gas or extractive resources, pipelines or haul routes servicing these resources?	Yes.	5.3.1.2
2.10	Does any part of the Study Area include land that is part of the State Stock Route network?	No.	-
2.11	Does the Study Area include any part of land leased, reserved, or granted in trust under the <i>Land Act 1994</i> ?	No.	-
2.12	Is any part of the Study Area within a port or on strategic port land?	No.	-
3. Natural hazards			
3.1	Is the Study Area or its access at risk from natural hazards such as flooding or drainage, bushfire and land slip?	No.	7.1.4 8
3.2	Is the Study Area or its access at risk from storm surge?	No.	-
3.3	Are there any declared pests in the area or is any part of the Study Area subject to a local government pest management plan?	Yes.	10.2.1.3
4. Water quality			
4.1	Will the proposal have impacts on surface or groundwater quality?	Yes.	7.3.2
4.2	Is the Study Area in close proximity to a watercourse?	No.	7.2.1
4.3	Is any part of the Study Area within a wild river area declared under the <i>Wild Rivers Act 2005</i> ? (IPA, schedule 8 applies)	No.	-
4.4	Does any part of the proposal involve development below high water mark (tidal), or within the beds and banks of a watercourse, lake or spring (non-tidal)? (IPA, schedule 8 applies)	No.	-
4.5	Will waste water disposal or stormwater from the proposal affect water quality either by sedimentation or contamination from effluent?	No.	7.3.2
4.6	Will the proposal have impact on hydrology, including— (a) change to existing drainage patterns; (b) groundwater flow?	No. No.	7.3

MATTER		YES/NO	SECTION
5. Conservation values			
5.1	Is the Study Area identified in the SEQ regional plan and/or the Koala Conservation Plan and Management Program 2006 as any of the following? (a) Koala conservation area (b) Koala sustainability area (c) Urban koala area.	No.	4.2.2.9 4.2.2.14
5.2	Is the Study Area in or adjacent to an area protected under the <i>Nature Conservation Act 1992</i> ?	No.	-
5.3	Is the Study Area in an area or adjacent to an area likely to have rare, endangered or threatened flora or fauna?	Potentially.	10.2.1 10.2.2.3
5.4	Does the proposal involve building work on land that is partly or completely seaward of a coastal building line under the <i>Coastal Protection and Management Act 1995</i> ? (IPA, schedule 8 applies)	No.	-
5.5	Does the proposal involve work within a coastal management district under the <i>Coastal Protection and Management Act 1995</i> ? (IPA, schedule 8 applies)	No.	-
5.6	Is the Study Area included in an area over which a State or regional coastal management plan applies?	No.	-
5.7	Is the Study Area in or adjacent to an area protected under the <i>Marine Parks Act 1982</i> ?	No.	-
5.8	Will the proposal affect the biodiversity and conservation values of the Study Area?	Yes.	10.3
6. Environment Protection and Biodiversity Conservation Act 1999 (Cwlth) (EP&BC Act)			
6.1	Does part or all of the proposal significantly impact upon a matter on national environmental significance? If so, the proposal needs to be referred to the Department of the Environment and Water Resources for a determination as to whether or not it is a Controlled Action under the EP&BC Act, section 67.	No.	4.2.1.1
7. Cultural heritage			
7.1	Does the Study Area involve, or is the Study Area adjacent to, any place entered in the heritage register under the Queensland Heritage Act 1992, or identified as having cultural heritage significance in the relevant Planning Scheme. (IPA, schedule 8 applies).	No.	17.0
7.2	Does the Study Area contain any items on the register of the Queensland Estate, Aboriginal and Torres Strait Islander Cultural Heritage Register or Cultural Heritage Database?	No.	17.0
7.3	Is it possible the Study Area may contain areas or objects of archaeological or historic significance for Aboriginal or Torres Strait Islander cultural heritage values?		
7.4	Does any part of the Study Area include Aboriginal or Torres Strait land, or land subject to a native title claim or Indigenous Land Use Agreement?		
8. Health, safety, amenity and social impacts			

MATTER	YES/NO	SECTION
8.1 Is the proposal an environmentally relevant activity as listed in schedule 1 of the <i>Environmental Protection Regulation 1998</i> ? (IPA, schedule 8 applies).		
8.2 Does the Study Area include lands recorded in the environmental management register or contaminated land register under the <i>Environmental Protection Act 1994</i> , or a notifiable activity under schedule 2 of that Act?	No.	5.4
8.3 Does the proposal have the potential to release contaminants, or include a notifiable activity under the <i>Environmental Protection Act 1994</i> , schedule 2? (IPA, schedule 8 applies)		
8.4 Is the proposal sensitive to air quality?	No.	6.0
8.5 Are there known or potential air quality problems in the area that may affect the proposal?	No.	6.0
8.6 Does the proposal have the potential to create air quality problems for the area or odour emissions? If so, will the proposal affect the amenity of adjoining or nearby uses due to the times, nature, intensity and proximity of the air quality problems or odour?	No.	6.0
8.7 Will the proposed community infrastructure generate significant greenhouse gas emissions?	No.	18.8 18.9
8.8 Is the proposal a noise sensitive land use? If so, are surrounding uses compatible?	No.	13.1 13.2 13.3
8.9 Does the proposal have the potential to create noise nuisance for the surrounding area? If so, will the proposal affect the amenity of adjoining or nearby uses due to the times, nature, intensity and proximity of the noise?	No.	13.0
8.10 Will the proposal include external lighting? If so, will the proposal affect the amenity of adjoining or nearby uses due to the times, nature, intensity and proximity of external lighting?		
8.11 Will the appearance of the proposal, including the physical compatibility of the proposal (e.g. scale, height, materials, colours, Study Area coverage) affect the amenity of adjoining or nearby uses?	Yes.	15.1.3 15.2.3
8.12 Will the proposal impact on scenic values including landscape character and visual amenity?		
8.13 Will the proposal generate significant amounts of traffic? If so, will the proposal affect the amenity of adjoining or nearby uses due to the times and nature of traffic generation, the location of access points, and the adequacy of on-site parking and public transport?	Yes.	15.1.3 15.2.3
8.14 Will the proposal generate significant amounts, or sensitive types, of waste? If so, will the waste affect the health, safety or amenity of adjoining or nearby uses?	No.	9.0
8.15 Will the proposal create a need for personal safety and building security measures? If so, is there a need for crime prevention measures for users of the Study Area and for access to the Study Area? Would such measures affect the safety and amenity of adjoining or nearby uses?	No.	-

MATTER		YES/NO	SECTION
8.16	Is the proposal likely to have any impacts on the economic activities of the area, including— (a) labour and markets; (b) service delivery; (c) local industries?	Limited	21.0
8.17	Is the proposal controversial or could it lead to conflict or concern in the community?	No.	-
8.18	Is the proposal a childcare centre? If so, building requirements under the <i>Queensland Development Code</i> , part 22 may apply.	No.	-
8.19	Is the proposal a nursing home or hostel? If so, requirements under the <i>Health Regulation 1996</i> may apply.	No.	-
8.20	Is the proposal a private health facility? If so, requirements under the <i>Queensland Development Code</i> , part 7, may apply.	No.	-
8.21	Does the proposal involve a major hazard facility or is the Study Area within or adjacent to a major hazard facility under the <i>Dangerous Goods Safety Management Act 2001</i> ?	No.	-
9. Infrastructure			
9.1	Does the proposal create additional demand for infrastructure, including augmentation of existing networks, for— (a) water; (b) sewerage; (c) roads; (d) wastewater management; (e) solid waste management; (f) energy; (g) telecommunications?	No.	-
9.2	Is the Study Area in the vicinity of an airport or aviation facilities, or both?	No.	16.1.4
9.3	Is any part of the Study Area situated in an electricity easement or within 100m of a substation site?	No.	-
10. Traffic and transport			
10.1	Will the proposal generate additional vehicle, pedestrian or cycle traffic, or increase demand for public transport? If so, is there a need to change one or more of the following in the locality to meet the needs of those using the community infrastructure— (a) traffic management arrangements; (b) public transport networks and services; (c) pedestrian and cycling networks?	No.	-

MATTER	YES/NO	SECTION
10.2 Does the location and design of the proposed community infrastructure enable connections to public transport, cycling and pedestrian networks?	No.	-
10.3 Is the proposal consistent with the land use and transport planning principles detailed in relevant integrated regional transport plans?	n/a	-
10.4 Are changes proposed to the traffic ingress and egress for the Study Area?	No.	16.2.2 16.3.3
10.5 Does the Study Area adjoin or gain access from a State-controlled road? Will the proposal impact on a State-controlled road?	No.	16.1.1
10.6 Will the proposal impact on the provision of existing or future public passenger transport services or facilities?	No.	16.0
10.7 Will the proposal impact on existing or future railway land or facilities?	No.	16.1.4
10.8 Does the proposal involve tidal works or prescribed tidal works? (IPA, schedule 8 applies)	No.	-

TOR Cross Reference

TERMS OF REFERENCE	EIS SECTION
1. INTRODUCTION	
1.1 Project Proponent	1.2
1.2 Project Description - brief description of the project and its location	1.0
1.3 Objectives and Key Issues of the EIS	
1.3.1 Objectives of the EIS	1.3
1.3.2 EIS Key Issues	2.1 2.2 3.0 5.0 – 18.0
1.4 Cross-reference with the EIS – the EIS and the final TOR are to be cross-referenced to ensure that all the relevant issues have been addressed	Appendix B
2. PROJECT JUSTIFICATION AND FEASIBLE ALTERNATIVES	
2.1 Project Justification – description of the justification for the project, with particular reference made to the economic and social benefits. The status of the project should be discussed in a regional, State and National context.	2.1

TERMS OF REFERENCE	EIS SECTION
2.2 Feasible Alternatives - description of feasible alternatives, including conceptual, technological and locality alternatives to the project, and discussion of the consequences of not proceeding with the project.	2.2
3. PROJECT DESCRIPTION	
3.1 Location Details - overall locality plan of the Study Area within a State or regional context together with a general description of land uses and the nature of the land affected by the proposed development.	3.1
3.2 Physical Details of Structures - typical form, physical dimensions and construction materials of the structures, insulators, conductors, buildings, transformer bays, busbars, SVCs etc., as appropriate, proposed for the project.	3.2
3.3 Construction, Maintenance and Decommissioning Activities - description of construction stages and equipment used, activities relating to the inspection, operation, maintenance and decommissioning of the development, and the surrender, if any, of the underlying easements.	3.3
3.4 Infrastructure Requirements	
3.4.1 Energy - describe electricity requirements, for the construction and operation phases of the project.	3.4.1
3.4.2 Water Supply and Storage - information on water usage by the project, including the quality and quantity of all water to be supplied to and discharged from the site from the various sources and the reliability of those sources.	3.4.2
3.4.3 Stormwater Drainage - proposed stormwater drainage system and the proposed disposal arrangements, including any off-site services. A Stormwater Management Plan should be prepared for the site.	3.4.3
3.4.4 Sewerage – a description, in general terms, the sewerage infrastructure required by the project. Information is required on any on site treatment.	3.4.4
3.4.5 Telecommunications – a description of the telecommunications requirement of the project where telecommunications sites will be developed and the proposed tenure; and description of any impacts on existing telecommunications infrastructure and identification of the owners of that infrastructure.	3.4.5
4. ENVIRONMENTAL VALUES AND MANAGEMENT OF IMPACTS	
4.1 Physical Environment	
4.1.1 Land	
4.1.1.1 Topography / Geomorphology - topography of the proposal with contours at suitable increments, shown with respect to AHD. Significant features of the locality should be included on the maps and commentary on the maps should be provided highlighting the significant topographical features.	5.2.1
4.1.1.2 Soils and Geology - description of the geology and geomorphology of the Study Area in sufficient detail to describe the geology of the site in terms of dominant rock types in a regional context.	5.3.1

TERMS OF REFERENCE	EIS SECTION
4.1.1.3 Land Contamination – outline of the possible contamination of land from aspects of the project; measures of prevention, recording, containing and/or remediating of contaminated land.	5.4
4.1.2 Climate and Air Quality - generic details of the existing air quality and the presence of pollutants; identified atypical meteorological conditions and their likely frequency of occurrence; description of the climatic features and microclimate of the Study Area; and general description of how climate change may affect the development.	6.0
4.1.3 Hydrology – outline of the hydrology traversed by the Study Area and surrounding areas; any likely impacts on groundwater and surface water quality and flow, water contamination risk, flooding potential, surge potential and hydrology, alterations to drainage patterns and crossing of waterways including mitigation measures and their effectiveness.	7.0
4.1.4 Fire – discussion of any likely causes due to construction and maintenance activities of the proposed development; likely impacts on burning for pasture management and / or weed control; and potential impact of bushfires on the proposed development.	8.0
4.1.5 Waste Management	
4.1.5.1 Character and quantities of waste materials - an inventory of all wastes to be generated by the project during the construction and operational phases of the project.	9.1
4.1.5.2 Solid waste disposal - the proposed location, site suitability, dimensions and volume of any landfill requirements for solid wastes generated by the project.	9.2.1
4.1.5.3 Liquid waste - description of the origin, quality and quantity of wastewater originating from the project.	9.2.2
4.2 Biological Environment	
4.2.1 Sensitive Environmental Areas - description of the conservation significance, including wildlife and habitat, of any specific portions of the Study Area affecting sensitive environmental areas. For sensitive environmental areas, describe the extent, integrity and relative importance of the biological communities of the Study Area and surrounding area.	21.1.3 21.2.3
4.2.2 Flora and Fauna	
4.2.2.1 Flora – Description of Existing Environmental Values - details of the vegetation across the Study Area including the surrounding area; identified threatened species and communities; and existing occurrence of pest species.	10.2.1 Appendix C
4.2.2.2 Fauna - Description of Existing Environmental Values – details of the aerial, terrestrial and aquatic fauna present or likely to be present in the area or in areas that may be affected by the project, including the existence of endangered, vulnerable or rare species under both Commonwealth and State legislation. Description of available fauna habitat.	10.2.2 Appendix C
4.2.2.3 Flora and Fauna - Potential Impacts and Mitigation	
4.2.2.4 Flora Potential Impacts – description of any likely direct and indirect impacts on terrestrial and aquatic flora. Discussion	10.3

TERMS OF REFERENCE	EIS SECTION
of the ability of identified vegetation to withstand any increased pressure resulting from the project and the likely impact of the project on the abundance and distribution of exotic species, weeds and diseases.	
4.2.2.5 Flora Mitigation Measures - measures to mitigate impacts and their adequacy and effectiveness. This includes measures for ongoing management as well as the barrier, fragmentation and edge effects of the Study Area.	10.4
4.2.2.6 Fauna Potential Impacts - any likely direct and indirect impacts on aerial, terrestrial, feral and aquatic fauna including migratory species, and any relevant bird flight paths. Attention should be given to any rare, threatened or endangered species, or species and habitats of local, regional, State or National environmental significance identified in surveys or desktop studies. Detail the ability of identified fauna to withstand any increased pressure resulting from the project.	10.4
4.2.2.7 Fauna Mitigation Measures - measures to mitigate impacts, including wildlife corridors and compensatory habitat areas and their adequacy and effectiveness. Also outline ongoing monitoring measures.	10.4
4.3 Socio-Economic Environment	
4.3.1 Land Use – description of each existing use on the Study Area and uses adjoining the Study Area. Discuss potential site specific and cumulative impacts of the project on existing and potential land use and developments.	11.0
4.3.2 Socio-Economic Issues - description of the socio-economic characteristics of the community surrounding the proposed development and an assessment of the potential impacts (real or perceived) of the development of the Study Area.	12.0
4.3.3 Noise and Vibration - details of any noise sensitive receivers or locations within or near the proposed development; their respective distance from the proposed development; and, if any, existing ambient noise levels.	13.0
4.3.4 Electric and Magnetic Fields - potential impacts of electric and magnetic fields on fauna, agriculture, TV reception, radio, on the quality of telephone and mobile communications, as well as navigational instruments and adjacent conductive materials. Also includes details of potential risk of electric and magnetic fields from the proposed substation on adult and child health.	14.0
4.3.5 Landscape Character	
4.3.5.1 Landscape – description, in general terms, of the existing character of the landscape that will be affected by the proposal. Describe the potential impacts of the project landscape character of the site and the surrounding area.	15.1
4.3.5.2 Visual Amenity - existing landscape features, panoramas and views that have, or could be expected to have, value to the community whether of local or regional significance. Evaluation of local and regional visual impacts of the major structures, access tracks and easement clearance.	15.2
4.3.6 Transport Infrastructure, Traffic and Amenity – description of the existing transport infrastructure, traffic and amenity. Discussion of arrangements and requirements of transportation and an assessment of potential impacts on infrastructure, traffic and amenity.	16.0
4.3.7 Non-Indigenous Cultural Heritage - impact of the proposed development on non-indigenous cultural heritage.	17.1
4.3.8 Aboriginal Cultural Heritage – potential impact of the proposed activities on Aboriginal Cultural heritage.	17.2

TERMS OF REFERENCE	EIS SECTION
5. TOWN PLANNING AND LEGISLATIVE REQUIREMENTS	
5.1 Description of Each Relevant Planning Scheme - special attributes affecting the Study Area that are identified on each relevant Planning Scheme, together with any consistencies or otherwise with the Scheme(s).	4.2.2.9 11.0
5.2 Outcomes Summary - summary of the intentions or outcomes sought for uses and works on the Study Area and in the surrounding area in each relevant Planning Scheme.	11.0
5.3 Description of Each State Planning Policy (SPP) - description of any special attributes affecting the Study Area that are identified in a State Planning Policy including a statement about the consistency with any relevant SPP.	4.1.3 4.2.2.11
5.4 Effect on Regional Plan or Master Plan, If Any - description of any special attributes affecting the proposed development that are identified in any regional plan, where not identified as adequately reflected in the relevant Planning Scheme.	4.2.2.10
5.5 Description of Nature, Scale and Intensity - description of the nature, scale and intensity of each use proposed as part of the community infrastructure.	4.2.2.7 4.2.2.8
6. ENVIRONMENTAL MANAGEMENT PLAN - (EMP) covering the life cycle of the proposed development. The EMP will include any relevant impacts identified during the EIS process should be considered and a consolidated list of mitigation measures proposed to be undertaken to prevent, minimise or compensate for the relevant impacts of the action. The plan should address, but not be limited to, the following matters: ▪ Key Performance Objectives; ▪ Management Strategy; and ▪ Performance Indicators	20.0
7. OTHER APPROVALS AND CONDITIONS	
7.1 Federal Legislation - requirements of relevant Federal legislation including the roles of Government Agencies, including any approvals required.	4.1.1 4.2.1 4.4
7.2 State Legislation and Permit Requirements - requirements of relevant State legislation including the roles of Government Agencies, including any approvals required.	4.1.2 4.2.2 4.3 4.4
7.3 Local Government Planning, Ordinances and By-Laws - relevant local government planning and land use requirements of the relevant City or Shire Councils including local ordinances and by-laws such as local vegetation laws. Should also include a list of the approvals required for the project and the expected program for approval of applications.	4.2.2.9

TERMS OF REFERENCE	EIS SECTION
8. ENVIRONMENTAL COST-BENEFIT SUMMARY – summary of both the short and long term environmental costs and benefits to be borne by the community and the environment, such as reduced productivity on land impacted by the development, quantity of good agricultural land affected, areas of high conservation values affected, and reduction in greenhouse gas emissions.	21.0
9. POWERLINK'S ENVIRONMENTAL RECORD – environmental record including reference to its environmental policy and planning framework and any proceedings under a Commonwealth, State or Territory law against Powerlink.	23.0
10 REFERENCES - references consulted should be presented in the EIS in a recognised format.	24.0
RECOMMENDED APPENDICES	
A1 – Schedule 2 of the DLGP Guidelines	Appendix B
A2. Final Terms of Reference for this EIS	Appendix A
A3. Corridor Selection Report - If applicable, a copy of the Corridor Selection Report and / or Substation Site Selection Report should be included.	N/a
A4. Development Approvals - list of the development approvals required by the project should be presented (in the expected sequencing of applications) along with their corresponding regulating legislation and the approving authority.	Table 11.1
A5. Study Team - qualifications and experience of the study team and specialist sub-consultants and expert reviewers should be provided.	Appendix E
A6. Consultation Report - including the details of affected and interested persons by type or organisation, and the statement of planned consultation with those persons, originally provided with the draft Terms of Reference. It should describe how 'interested' and 'affected persons,' and any 'affected parties' as defined by the EPBC Act were identified and include the matters likely to be of concern to other parties affected or likely to be affected by the development for the proposed community infrastructure.	Appendix D
A7. The Final EIS should include the following: a) a list of the parties consulted (subject to their permission); b) a copy of newspaper tear-sheet of Draft EIS advertisements; c) a summary of all submissions and the account taken of the issues raised; d) any further assessment of environmental effects of the project; e) any additional strategies for managing the environmental effects; f) a statement of any matters proposed to be included in the designation under the IPA, s2.6.4; and g) any recommended changes to the Substation which produces the Final Layout.	Appendix D

APPENDIX C TERRESTRIAL SPECIES LISTS

Fauna Species List

FAMILY / SCIENTIFIC NAME	COMMON NAME
MAMMALS	
LEPORIDAE	
<i>Lepus europaeus</i>	Brown Hare
MACROPODIDAE	
<i>Macropus parryi</i>	Pretty Faced Wallaby
<i>Wallabia bicolor</i>	Swamp Wallaby
REPTILES	
AGAMIDAE	
<i>Pogona barbata</i>	Eastern Bearded Dragon
BIRDS	
ANATIDAE	
<i>Anas gracilis</i>	Grey Teal
<i>Anas superciliosa</i>	Pacific Black Duck
ARDEIDAE	
<i>Ardea intermedia</i>	Intermediate Egret
<i>Ardea pacifica</i>	White-necked Heron
COLUMBIDAE	
<i>Ocyphaps lophotes</i>	Crested Pigeon
<i>Phaps chalcoptera</i>	Common Bronzewing
<i>Columba livia</i>	Feral Pigeon
PSITTACIDAE	
<i>Cacatua sanguinea</i>	Little Corella
<i>Cacatua galerita</i>	Sulphur-crested Cockatoo
<i>Cacatua roseicapilla</i>	Galah
<i>Trichoglossus chlorolepidotus</i>	Scaly-breasted Lorikeet
<i>Aprosmictus erythropterus</i>	Red-winged Parrot
<i>Platycercus adscitus</i>	Pale-headed Rosella
HALCYONIDAE	
<i>Dacelo novaeguineae</i>	Laughing Kookaburra
<i>Todiramphus sanctus</i>	Sacred Kingfisher
MALURIDAE	
<i>Malurus leucopterus</i>	White-winged Fairy-wren
<i>Malurus cyaneus</i>	Superb Fairy-wren
PARDALOTIDAE	

FAMILY / SCIENTIFIC NAME	COMMON NAME
<i>Acanthiza nana</i>	Yellow Thornbill
<i>Acanthiza reguloides</i>	Buff-rumped Thornbill
<i>Gerygone olivacea</i>	White-throated Gerygone
<i>Pardalotus striatus</i>	Striated Pardalote
<i>Smicromis brevirostris</i>	Weebill
MELIPHAGIDAE	
<i>Manorina melanocephala</i>	Noisy Miner
<i>Lichenostomus chrysops</i>	Yellow-faced Honeyeater
<i>Philemon corniculatus</i>	Noisy Friarbird
<i>Philemon citreogularis</i>	Little Friarbird
<i>Entomyzon cyanotis</i>	Blue-faced Honeyeater
<i>Lichenostomus leucotis</i>	White-eared Honeyeater
<i>Melithreptus brevirostris</i>	Brown-headed Honeyeater
<i>Myzomela sanguinolenta</i>	Scarlet Honeyeater
POMATOSTOMIDAE	
<i>Pomatostomus temporalis</i>	Grey-crowned Babbler
PACHYCEPHALIDAE	
<i>Pachycephala rufiventris</i>	Rufous Whistler
DICRURIDAE	
<i>Rhipidura leucophrys</i>	Willie Wagtail
<i>Rhipidura fuliginosa</i>	Grey Fantail
<i>Grallina cyanoleuca</i>	Magpie-lark
CAMPEPHAGIDAE	
<i>Coracina novahollandiae</i>	Black-faced Cuckoo-shrike
ORIOOLIDAE	
<i>Oriolus sagittatus</i>	Olive-backed Oriole
ARTAMIDAE	
<i>Cracticus nigrogularis</i>	Pied Butcherbird
<i>Cracticus torquatus</i>	Grey Butcherbird
<i>Gymnorhina tibicen</i>	Australian Magpie
CORVIDAE	
<i>Corvus orru</i>	Torresian Crow
CORCORACIDAE	
<i>Struthidea cinerea</i>	Apostlebird
HIRUNDINIDAE	
<i>Hirundo neoxena</i>	Welcome Swallow

Flora Species List

FAMILY / SCIENTIFIC NAME	COMMON NAME
ADIANTACEAE	
<i>Cheilanthes sieberi</i>	Rock Fern
APOCYNACEAE	
<i>Carissa ovata</i>	Currant bush
ASPHODELACEAE	
<i>Bulbine sp.</i>	Bulbine Lily / Native Leek
ASTERACEAE	
<i>Bidens pilosa</i>	Cobblers Pegs
<i>Ozothamnus dotophyllus</i>	
<i>Senecio lautus</i>	Fireweed
<i>Chrysocephalum apiculatum</i>	Yellow Buttons
CACTACEAE	
<i>Opuntia stricta</i>	Prickly pear
<i>Opuntia tomentosa</i>	Velvety Tree Pear
CAESALPINIACEAE	
<i>Senna artemisioides</i>	
CAMPANULACEAE	
<i>Wahlenbergia gracilis</i>	Bluebell
CASUARINACEAE	
<i>Allocasuarina luehmannii</i>	Bull oak
CHENOPODIACEAE	
<i>Neobassia proceriflora</i>	Soda Bush
CUPRESSACEAE	
<i>Callitris glaucophylla</i>	Cypress Pine
CYPERACEAE	
<i>Cyperus sp.</i>	A sedge
<i>Fimbristylis dichotoma</i>	Common Fringe-sedge
<i>Gahnia aspera</i>	Sword Grass
JUNCACEAE	
<i>Juncus sp.</i>	Rush
MIMOSACEAE	
<i>Acacia leiocalyx</i>	Black Wattle
<i>Acacia ixiophylla</i>	
<i>Acacia sp.</i>	Wattle
MYOPORACEAE	
<i>Eremophila mitchellii</i>	False Sandlewood

FAMILY / SCIENTIFIC NAME	COMMON NAME
<i>Myoporum acuminatum</i>	Water Bush
MYRTACEAE	
<i>Angophora leiocarpa</i>	Rusty Gum
<i>Eucalyptus crebra</i>	Narrow-leaved Ironbark
<i>Eucalyptus fibrosa subsp. fibrosa</i>	Broad-leaved Ironbark
<i>Eucalyptus microcarpa</i>	Grey Box
<i>Eucalyptus populnea</i>	Poplar Box
<i>Eucalyptus tereticornis</i>	Blue Gum
<i>Melaleuca sp.</i>	
<i>Melaleuca uncinata</i>	Broombrush
OXALIDACEAE	
<i>Oxalis corniculata</i>	Yellow wood sorrel
PITTOSPORACEAE	
<i>Pittosporum angustifolium</i>	Cattle Bush
PHORMIACEAE	
<i>Dianella revoluta</i>	Flax Lily
<i>Dianella caerulea var. producta</i>	Blue Flax Lily
PLANTAGINACEAE	
<i>Plantago lanceolata</i>	Lamb's tongue
POACEAE	
<i>Aristida calycina</i>	Wiregrass
<i>Aristida ramosa</i>	Purple wiregrass
<i>Aristida queenslandica</i>	
<i>Chloris truncata</i>	Windmill grass
<i>Cynodon dactylon</i>	Green couch
<i>Cymbopogon refractus</i>	Barbwire grass
<i>Eragrostis brownii</i>	Brown's Lovegrass
<i>Eragrostis sororia</i>	Woodland Lovegrass
<i>Panicum decompositum</i>	Native Millet
<i>Themeda triandra</i>	Kangaroo Grass
RHAMNACEAE	
<i>Alphitonia excelsa</i>	Soap Ash
SANTALACEAE	
<i>Santalum lanceolatum</i>	Sandalwood
SAPINDACEAE	
<i>Dodonaea viscosa subsp. spatulata</i>	Sticky Hopbush
SOLANACEAE	

FAMILY / SCIENTIFIC NAME	COMMON NAME
<i>Solanum ellipticum</i>	Potato bush
VERBENACEAE	
<i>Verbena tenuisecta</i>	Maynes Pest
XANTHORRHOEACEAE	
<i>Lomandra longifolia</i>	Spiny-headed Mat Rush
<i>Lomandra multiflora</i>	Many-headed Mat Rush

APPENDIX D

CONSULTATION REPORT



WESTERN DOWNS SUBSTATION Environmental Management Plan

Built section/Functional Location: Kogan

Version Date: November 2009

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1	22/10/09	Changes following Powerlink review of first draft (S. Brisbane)
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10		

Notes:

1. Legislation referenced in this EMP can be found at:
 - o Local Laws - <http://www.localgovernment.qld.gov.au/Laws/LocalGovernment/LocalLaws/Locallawsdatabase.aspx>
 - o State legislation – www.legislation.qld.gov.au
 - o Commonwealth Legislation - www.comlaw.gov.au
2. Obj. ref: - is the document reference number for Powerlink's internal electronic document and record management system (eDRMS). The Powerlink eDRMS is called Objective.

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1 Purpose

The Western Downs Substation Environmental Management Plan (EMP) provides an environmental management framework and procedures to avoid or minimise the actual and potential environmental impacts resulting from activities undertaken for the Western Downs Substation project.

This EMP covers Powerlink's activities only (activities carried out by Powerlink, its contractors or representatives). Powerlink is not responsible for the activities in the project area (e.g. easement) of other parties (such as activities carried out by landholder or of other utilities).

The purpose of the EMP is to ensure:

- Effective and efficient environmental management is carried out through the construction and operation of the asset;
- Principles and objectives of the National Strategy for Ecologically Sustainable Development (1992) are incorporated into all phases of the project; and
- Compliance with relevant State and Commonwealth legislation.

It will provide:

- Evidence of practical and achievable plans for the management of the project to ensure that environmental requirements are complied with, by providing an integrated planning framework for comprehensive monitoring and control of construction and operational impacts;
- Relevant local, state and Commonwealth authorities with a framework to confirm compliance with policies and requirements; and
- The community with evidence of the management of the project in an environmentally acceptable manner.

This EMP contains:

- A description of Powerlink's environmental management objective and policy;
- A description of typical activities to be undertaken;
- Details of Powerlink and other's responsibilities; and
- Environmental aspects, including key performance objectives, management strategies and performance indicators of potential impacts from the proposed activities.

Each environmental aspect of the EMP is divided into preconstruction, construction, and operation and maintenance phases, with the following structure within each phase:

- The operational policy which applies;
- The performance criteria for each aspect;
- The implementation strategies to achieve the performance standards;
- The monitoring and auditing procedures to assess performance;

- The procedure for reporting of monitoring and auditing results; and
- The corrective action or choice of corrective action.

Powerlink substation assets generally have a minimum design life of 40 – 50 years, and significant changes to environmental management requirements, policies and legislation are expected during that period. As a result, the EMP will require updating from time to time during the life of the asset to maintain its currency and relevance. Updates may be triggered by changes in legislation, site activities, technology, information or community expectations (refer section 3.3).

This EMP has also been prepared to meet the Environmental Protection Agency's Guideline "Preparing environmental management plans" dated March 2003. The general requirements of ISO14000 suite of Environmental Management System Standards were also taken into consideration in the preparation of this Environmental Management Plan.

2 Powerlink Environmental Management Structure

Powerlink's organisation structure for the preconstruction, construction and maintenance phases of the project are shown in Figures 1, 2 and 3.

2.1 Preconstruction

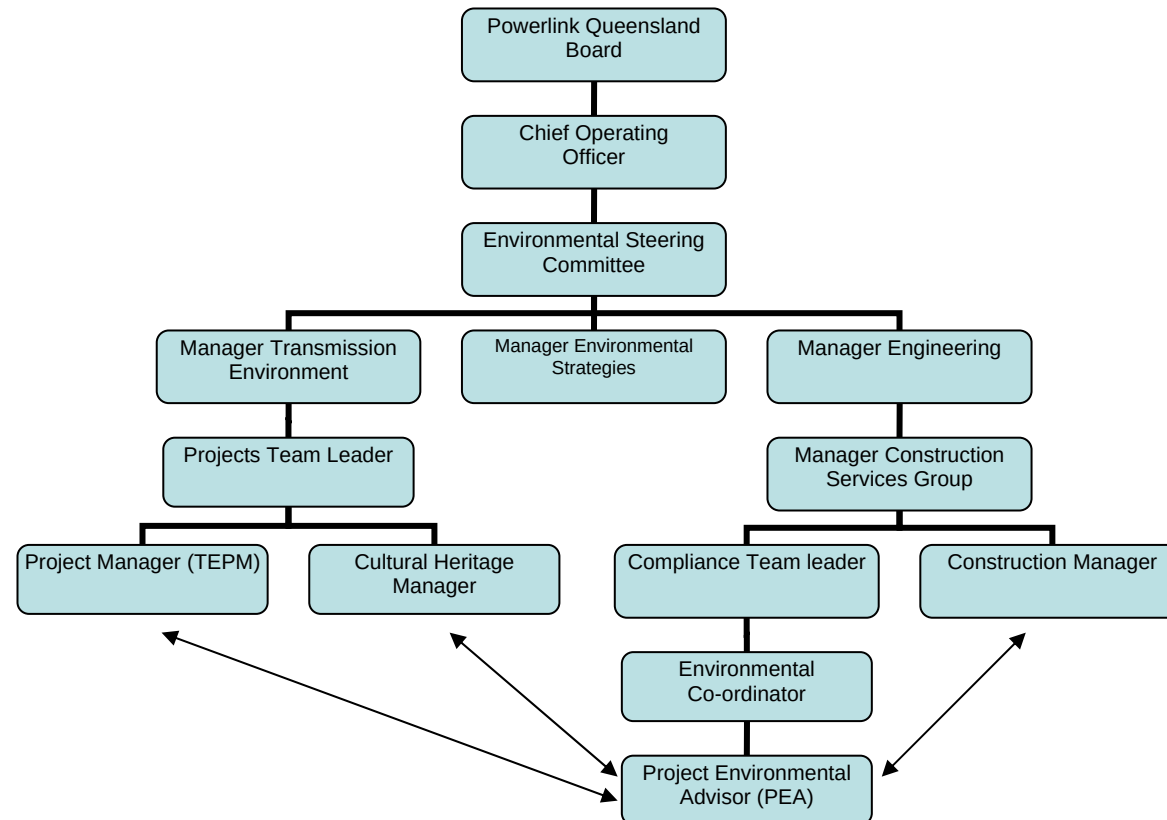


Figure 1: Powerlink's Environmental Management Structure – Preconstruction Phase

2.2 Construction

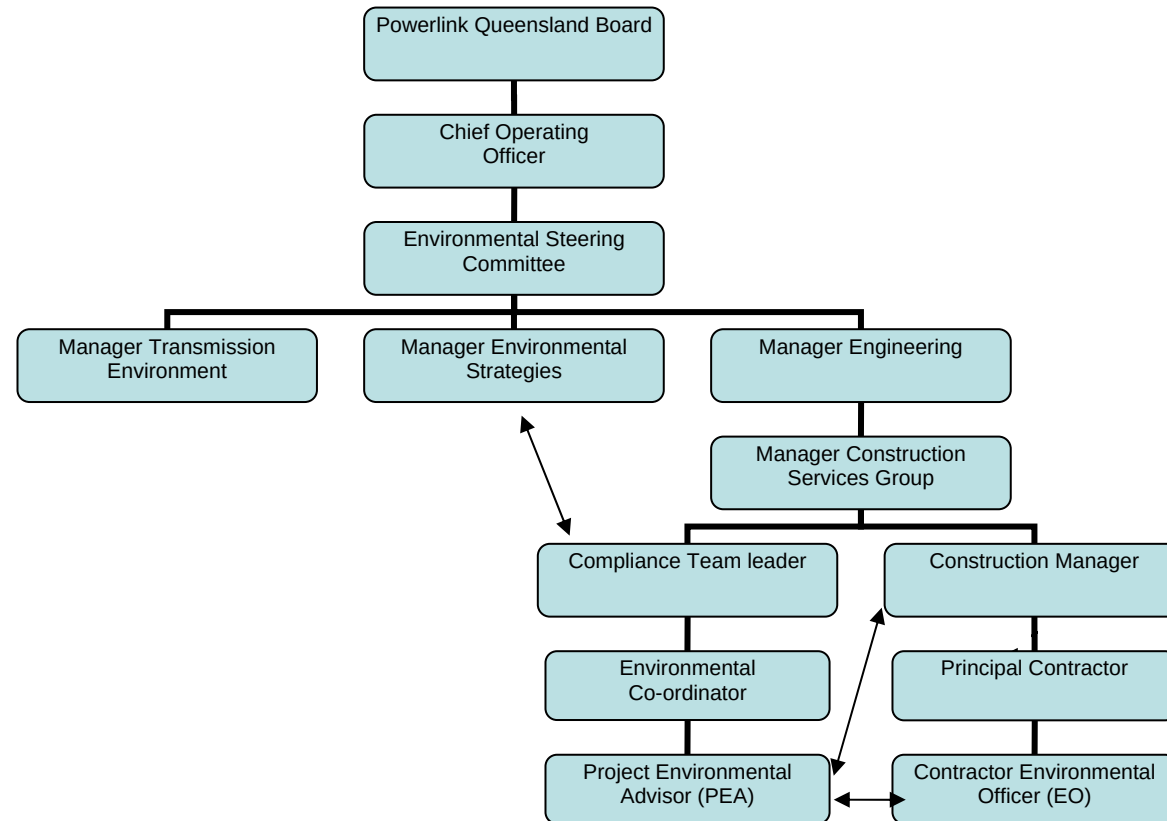


Figure 2: Powerlink's Environmental Management Structure – Construction Phase

Key project contacts during the construction phase of the project will be:

Position Title	Contact Person	Phone Number	Email
Manager Transmission Environment			
Manager Environmental Strategies			
Manager Engineering			
Construction Manager			
Principal Contractor			
Cultural Heritage Liaison Officer			
Project Environmental Advisor			

2.3 Operation and Maintenance

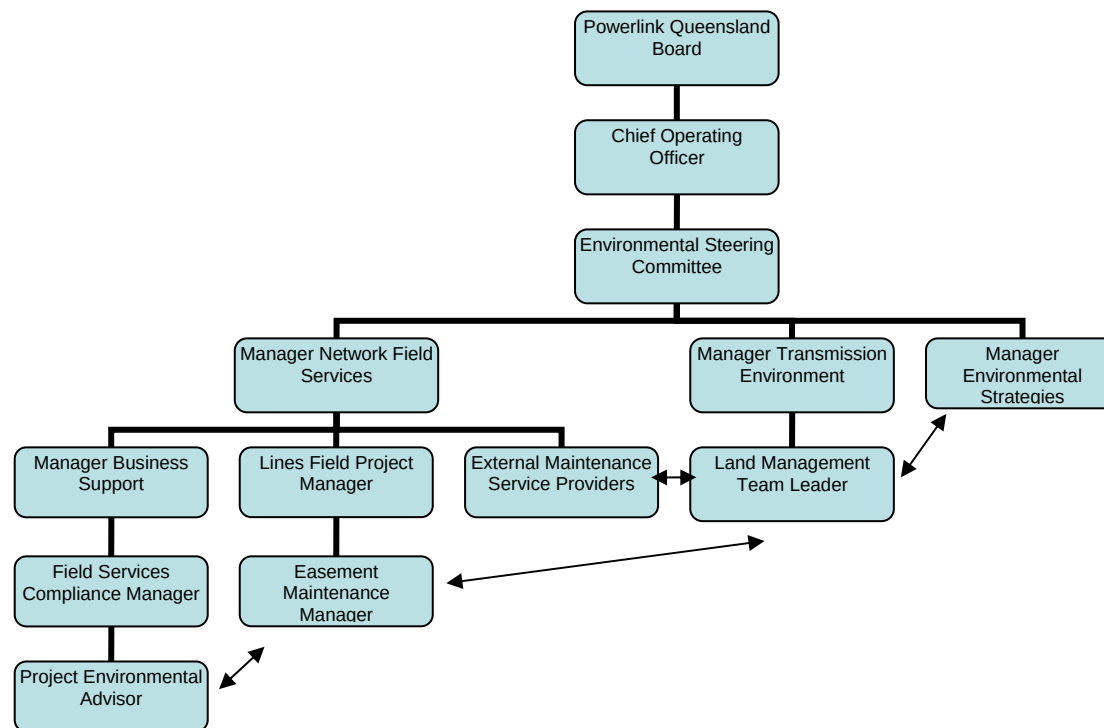


Figure 3: Powerlink's Environmental Management Structure – Maintenance Phase

Powerlink is committed to carrying out its activities in an environmentally responsible manner and has integrated responsible environmental management into all its business activities (See Appendix A – Environmental Policy).

3 Background to the Environmental Management Plan

3.1 *Implementation*

Powerlink is responsible for implementing the EMP for the whole project and ensuring compliance with the nominated requirements. Powerlink will also be responsible for ensuring appropriate corrective actions arising from a failure to meet stated performance requirements are implemented.

3.1.1 Preconstruction

Powerlink will have the necessary authority and responsibility for ensuring compliance with the EMP and the monitoring performance requirements for the preconstruction phase of the project. Initially this responsibility will be held by the Transmission Environment Project Manager (TEPM). The TEMPM will be responsible for communicating EMP requirements to design and other teams, where applicable to their involvement in the project.

The TEMPM will also be responsible for handing over the requirements of the environmental management plan to the construction project team, prior to the commencement of construction. During the handover, information on approvals/permits/licences, commitments and agreements will be provided.

Environmental Work Plans (EWPs) will also be prepared to assist in the implementation of this EMP. Information presented on the EWPs may include and not necessarily limited to:

- Vegetation communities
- Clearing extents and methods
- Access tracks
- Areas of cultural significance
- Significant environmental management measures
- Land status (e.g. weed status, contaminated land status)
- Special access requirements and controls.

The environmental work plans will be prepared in accordance with the Construction Services Group Clearing and Environmental Work Plan guideline (Obj. ref: A471860). The EWPs preparation will be facilitated by the Project Environmental Advisor (PEA) in conjunction with the TEMPM.

3.1.2 Construction:

Powerlink will appoint a PEA who will have the necessary authority¹ and responsibility for ensuring compliance with the EMP and monitoring performance requirements for construction phases of the project. The PEA and construction team will facilitate the preparation of EWPs, which will provide a summary of environmental management requirements during the construction phase.

Where contracts are entered into for work associated with this project, Powerlink will:

- Include the EMP in contract documents for all work to be undertaken by contractors
- Induct the contractor on the requirements of the EMP and Powerlink's expectations, on awarding of the contract
- Ensure that all contractors comply with the requirements of the EMP and appoint a suitably qualified and/or experienced Environmental Officer (EO) with the necessary authority to implement the relevant requirements of the EMP
- Ensure that the contractor prepares a contractor's environmental management plan (CEMP) which demonstrates how the contractor will meet the requirements of this plan. As required by contract, the CEMP should be submitted to Powerlink prior to any works being carried out to ensure that the CEMP meets the requirements of the contract and statutory obligations
- Require the contractor to report non-conformances to the EMP
- Require the contractor to report on a monthly basis on the implementation of this EMP
- Monitor and measure the performance of the contractor against the requirements of the EMP.

The PEA will also be responsible for handing over the requirements of the environmental management plan to those parts of the business responsible for maintenance and operation activities at the completion of construction. During the handover, information on approvals/permits/licences, commitments, ongoing management requirements and agreements will be provided.

At the end of the construction phase of the project, the PEA will also prepare a report outlining how each of the policy, performance criteria and implementation strategies contained in this EMP were met during the construction phase of the project. The PEA will also be responsible for documenting the implementation of this EMP, and ensuring that any records, reports or registers nominated in this EMP are prepared and filed in Powerlink's eDRMS (Objective).

Should works be carried out by using a contractor, the roles and responsibilities of the Principal and Contractor will be outlined in contracts prepared and issued by the Principal.

3.1.3 Operation and Maintenance:

Powerlink will appoint a Project Environmental Advisor (PEA) with the necessary authority and responsibility for ensuring compliance with the EMP and monitoring performance requirements for the operation and maintenance phase of the project.

¹ Refer to the contract for the project for authorities of the PEA.

3.1.4 Asset Removal or Replacement

As the asset will have a minimum design life in the order of 40-50 years, specific measures relating to asset removal or replacement (e.g. specific handling and management of wastes from asset removal, specific reinstatement outcomes to meet stakeholder requirements, work methods and environmental controls for asset removal) have not included in this EMP.

Asset removal or replacement will trigger a full review of the EMP prior to the carrying out of such activities. The review will ensure that the requirements of this EMP meet legislative and community expectations at the time of the asset removal or replacement. Specific work methods or instructions may also be prepared at that time to guide asset removal and replacement activities.

Any agreements, requirements or conditions relating to asset removal or replacement (e.g. conditions of a development approval) have been included in this Environmental Management Plan to ensure that such measures are not overlooked at the end of the asset's life.

3.2 Legislative requirements

A summary of the legislation and other applicable standards which establish the performance criteria for the environmental strategies can be found in Table 1.

Table 1
Legislative and other controls for Environmental Strategies

Environmental Aspect	Legislative/standards cross-reference
General	<i>Electricity Act 1994</i> <i>Electricity Regulation 2006</i> <i>Environmental Protection Act 1994</i> <i>Environmental Protection Regulation 1998</i> <i>Workplace Health and Safety Act 1995</i> <i>Workplace Health and Safety Regulation 1997</i>
Acid Sulphate Soils	<i>State Planning Policy 2/02</i>
Air Quality	<i>Air Quality – Management and Control of Dust AM-PR-0917 (Obj. ref: A596707)</i> <i>Environment Protection Measures for Ambient Air Quality</i> <i>Environmental Protection (Air) Policy 1997</i> <i>National Environment Protection Council, National</i>

Environmental Aspect	Legislative/standards cross-reference
Cultural Heritage	<i>Aboriginal and Torres Strait Islander Heritage Protection Act 1986</i> <i>Aboriginal Cultural Heritage Act 2003</i> <i>Australian Heritage Council (Consequential and Transitional Provisions) Act 2003</i> <i>Australian Heritage Council Act 2003</i> <i>Environment and Heritage Legislation Amendment Act (No. 1)2003</i> <i>Environment Protection and Biodiversity Conservation Act 1999</i> <i>Native Title (Queensland) Act 1993</i> <i>Native Title Act 1993</i> <i>Queensland Heritage Act 1992</i>
Energy Use/Greenhouse gas	<i>National Greenhouse and Energy Reporting Act 2007</i>
Erosion and Sediment Control	<i>Australian and New Zealand Guidelines for Fresh and Marine Water Quality, ANZECC, 2000</i> <i>Environmental Protection (Water) Policy 1997</i> <i>Maintenance of Access Tracks, Powerlink Procedure AM-PR- 0035 (Obj. ref: A510284)</i> <i>Soil Erosion and Sediment Control – Engineering Guidelines for Queensland Construction Sites – IE Australia, 1996</i> <i>Soil Erosion and Sediment Control – Powerlink Policy AM-POL- 0830 (Obj. ref: A517)</i> <i>Water Act 2000</i>
Fauna and Vegetation	<i>Agricultural Chemicals Distribution Control Act 1966</i> <i>Animal Care and Protection Act 2001</i> <i>Assessment of Hazardous Marginal Trees AM-PR-0855 (Obj. ref: A676)</i> <i>Environment Protection and Biodiversity Conservation Act 1999</i> <i>Nature Conservation (Wildlife) Regulation 2006</i> <i>Nature Conservation Act 1992</i> <i>Vegetation Control Standards, Powerlink Standard AM-STA-0834 (Obj. ref. A462955)</i> <i>Vegetation Management Act 1999</i> <i>Vegetation Management for Transmission Corridors and Sites, Powerlink Policy AM-POL-0050 (Obj. ref: A462945)</i> <i>Vegetation Management Regulation 2000</i> <i>Water Act 2000</i>
Land Contamination	<i>Draft Guidelines for the Assessment and Management of Contaminated Land, May 1998</i>
Noise and Vibration	<i>Environmental Protection (Noise) Policy 2008</i> <i>AS 2436: 1981 – Guide to noise control on construction, maintenance and demolition sites</i> <i>Noise Measurement Manual Department of Environment and Heritage 1995</i> <i>User's guide to the Environment Protection (Noise) Policy Environmental Protection Agency 1997</i> <i>AS 1055.1/2: 1997 – Acoustics – Description and management of environmental noise</i>

Environmental Aspect	Legislative/standards cross-reference
Hazardous Materials	<i>AS 1940: 2004, The storage and handling of flammable and combustible liquids</i> <i>Carriage of Dangerous Goods by Road Act 1984</i> <i>Carriage of Dangerous Goods by Road Regulation 1989</i> <i>Dangerous Goods Safety Management Act 2001</i> <i>Management of insulating and petroleum based liquid spills AM-POL-0076 (Obj. ref: A520843)</i> <i>Management, Transport and Disposal of Waste Insulating and Petroleum-Based Liquids (Regulated Wastes) AM-PR-0926 (Obj. ref: A598354)</i>
Biosecurity (Pest and Disease)	<i>Biosecurity Management – Pest and Pathogen Control Measures AM-PR-0039 (Obj. ref: A513014)</i> <i>Fire Ant Management Plan AM-PR-0781 (Obj. Ref: A582069)</i> <i>Integrated Planning Act 1997</i> <i>Land Protection (Pest and Stock Route Management) Act 2002</i> <i>Pest Management Act 2001</i> <i>Pest Management Act 2001</i> <i>Plant Protection Act 1989</i> <i>Vehicle and equipment cleandown AM-PR-0968 (Obj. ref: A256951)</i>
Traffic and Site Access	<i>Queensland Department of Main Roads Manual for Uniform Traffic Control Device</i> <i>Transport Operations (Road Use Management) Act 1995</i>
Waste	<i>Environment Protection (Waste Management) Policy 2000</i> <i>Environmental Protection (Waste Management) Regulation 2000</i> <i>Waste Management Strategy for Queensland 1996</i>

3.3 Review, update and continuous improvement

The EMP and EWPs will be reviewed and updated as required to ensure that they address any site related environmental issues or changes in guidelines, policies, procedures or legislation. The EMP and EWPs will also be reviewed at the completion of the construction phase of the project. The PEA, in consultation with other Powerlink staff, shall be responsible for this review and the internal GIS will be updated to reflect any new information discovered as part of this review.

Maintaining the currency of the EMP after the construction phase is completed will be the responsibility of the Manager Environmental Strategies, or delegate.

The EMP will also be amended or updated from time to time during the construction and operation of the asset to reflect:

- New information or discoveries occurring after the preparation of the EMP
- Change in site conditions or requirements
- Changes in statutory requirements or community expectations
- Changes in construction and/or operational activities, technology or equipment.

The review and update of the EMP and EWPs is to allow for a process of continuous improvement.

Any identified changes or deficiencies in the EMPs and EWPs will be promptly addressed and new revisions of the EMP/EWPs will be issued as necessary.

Any changes or updates to the EMP/EWPs will be discussed with the Manager Environmental Strategies to determine if such changes/updates trigger an external approval process.

3.4 Training requirements

3.4.1 Preconstruction Phase

The TEPM will be responsible for ensuring that all personnel working on the project during the preconstruction or planning phase of the project are aware of the requirements of this EMP.

The TEPM is also responsible for handing over the project, and providing details on the project to the PEA and construction team. Such information will be used by the PEA to prepare inductions and updating/preparing construction related records.

3.4.2 Construction Phase:

The PEA shall be responsible for ensuring that relevant staff are adequately trained regarding the contents, interpretation, responsibilities and performance measures contained in this EMP, and that personnel working on the project have sufficient knowledge and awareness to identify potential environmental issues. Unless stated otherwise in a contract, the Principal Contractor will be responsible for ensuring that all site personnel are trained/inducted on the requirements of this EMP and the procedures outlined within the CEMP, prior to site personnel carrying out any work.

All construction personnel shall be required to participate in an environmental induction, prior to their commencement of work on site. Records of personnel who have completed the inductions will be maintained.

This induction shall include:

- Awareness of the general environmental requirements for the project, including key site specific management measures
- Knowledge of the roles and responsibilities of the various parties on site, including the key contacts for reporting and notifications
- Training in appropriate corrective action in event that they become aware of an environmental issue
- Instruction on procedures and reporting on issues that may result in environmental degradation
- Awareness of cultural heritage (this may take the form of a separate induction and will be nominated in the cultural heritage requirements for the project).

3.4.3 Operation and Maintenance Phase:

Powerlink will appoint an officer with the necessary authority and responsibility for ensuring relevant training is provided to field staff to ensure compliance with the EMP during the operation and maintenance phase of the project.

3.5 *Reporting and records procedure*

3.5.1 Preconstruction Phase

Where development approval or designation is required, the TEPM will be responsible for finalising the EMP prior to construction commencing. The TEPM will also be responsible for ensuring that all approvals, agreements or commitments are documented and handed to the construction team.

For projects not requiring development approval or designation, the PEA will be responsible for finalising the EMP prior to construction commencing. The PEA will be responsible for maintaining the EMP currency during the construction phase of the project.

3.5.2 Construction Phase

All Powerlink and Contractor staff are required to report environmental issues or incidents to their direct Supervisor, who shall be responsible for reporting to the Powerlink Construction Manager, who will, in consultation with the PEA be responsible for implementing initial mitigation measures, and subsequent reporting to the Project Manager.

Processes for resolving environmental issues or incidents from a contractor working within a contractual framework, will also carried out in accordance with this contractual framework. During the construction phase, an environmental issues register will be established to resolve any environmental, community relation or cultural heritage issues associated with the construction phase. Items in the register may include actions to rectify observed non-conformances with the EMP or actions to prevent reoccurrences of a non-conformance.

Response to any environmental incident shall be carried out in accordance with the requirements of Powerlink's Emergency Response Management Handbook. This includes external reporting to the relevant Government Agencies (e.g. Environmental Protection Agency, Department of Natural Resources and Water, or relevant Local Authority)

Records of implementation of the EMP will also be completed during the construction phase. Non-conformance with the EMP will also be recorded and will include corrective actions to resolve these non-conformances. The PEA will prepare a monthly report which will summarise the performance of construction activities, non-conformances with the EMP and corrective and preventative actions.

Other records and reports which will be prepared during the construction phase include, but not necessarily limited to:

- Cultural Heritage Requirements

- Local Weed Management Plan
- Environmental Work Plans
- Landholder Consultation Records (esp. for clearing and access)
- Record of Activities within a Watercourse under s269 of the Water Act 2000
- Complaints Register
- Construction Close Out Records
- Any records pertaining to any approval, permit or licence.

Completing and collating records associated with and the reporting of environmental, community relations and cultural heritage is the responsibility of the PEA.

3.5.3 Operation and Maintenance Phase

All staff shall report any non-conformances with this EMP to their direct Supervisor, who shall be responsible for reporting to their relevant Manager. The manager, in consultation with the PEA will be responsible for implementing initial mitigation measures, and subsequent internal monthly and quarterly reporting.

When necessary, the Manager in consultation with Manager Environmental Strategies will be responsible for implementing a response in accordance with the requirements of Powerlink's Emergency Management Handbook. This includes external reporting to the relevant Government Agencies (e.g. Environmental Protection Agency, Department of Natural Resources and Water, or relevant Local Authority).

Inspections such as those required by AM-FM-0354 Maintenance of Concrete Pole Built Sections (Obj. ref: A535910), AM-FM-0377 Maintenance of Steel Pole Built Sections (Obj. ref: A537505), AM-PR-0034 Maintenance of Easements (obj. ref: A510274) and AM-POL-0154 Transmission Line Patrols (Obj. ref: A572682) will also be carried out on a regular basis during the life of the asset.

3.6 *Complaints procedure*

Landowners, occupiers and the general community will be consulted to ensure that any impact or disruption to their operations or infrastructure is minimised.

Any complaint received onsite or by the contractor must be reported verbally to Powerlink as soon as possible, and a followed up in writing within 24 hours.

The environmental issues register will be used to provide actions and timeframes to resolve complaints.

Media handling is to occur in accordance with the Media Policy in the Workplace Conduct for Powerlink Contractors (Obj. ref: A497976).

3.6.1 Preconstruction Phase

Concerns of landholders during the preconstruction phase of the project will be recorded and actioned. Powerlink's Management of Property Contact Information (Obj. ref: 388589) will be followed and a Land Owner Action Request Spreadsheet (Obj. ref: A387454) will be established to record and resolve the concerns.

Any concerns which are identified as impacting on construction, operation or maintenance activities will also be documented and provided to the PEA or PEA/Easement Maintenance Manager.

3.6.2 Construction Phase

A complaints handling protocol will be established and managed by the PEA, and all complaints received will be investigated, and where necessary actions will be implemented to resolve reasonable and relevant complaints.

An Environmental Complaints Register shall be established, and the following details recorded in the event of a complaint:

- Time and date of the incident/complaint
- Nature of the incident/complaint
- Name of person receiving / investigating the complaint
- Type of communication (e.g. telephone, letter, in person)
- Name and contact details of complainant (if provided)
- Investigation and response undertaken
- Corrective action taken as a result of the incident/complaint investigation and
- Follow up with complainant.

Powerlink Corporate Communications or Transmission Environment will also, where necessary, assist in the resolution of complaints or feedback from Local, State or Commonwealth Government.

3.6.3 Operation and Maintenance Phase

A complaints procedure will be established and managed by Powerlink and all complaints received will be investigated. An Environmental Complaints Register shall be established, consistent with the outline provided in section 3.6.

Powerlink Corporate Communications or Transmission Environment will also, where necessary, assist in the resolution of complaints or feedback from Local, State or Commonwealth Government.

4 Environmental Aspects

Key environmental aspects associated with the project, and their relationship to various activities carried out can be found in the following matrix:

		Environmental Aspects																
		Acid Sulphate Soils	Air Quality	Biosecurity (excluding weeds)	Cultural Heritage	EMF	Energy Use/GHG	Erosion and Sediment Control	Fauna	Hazardous Materials	Land Contamination	Noise and Vibration	Traffic	UXO	Vegetation (Flora)	Visual amenity	Waste	Weed Management
Activity	Preconstruction: Site inspections and surveys	•			•	•		•			•	•		•			•	
	Preconstruction: Design	•			•	•		•			○	•		•		○	•	
	Construction: Access, clearing and earthworks	•	●	○	●	•		●	●	•	○	○	•	•	●	●	○	○
	Construction: Foundations	•	○	•	●	•		○	•	•	○	○	•	•	•	•	○	•
	Construction: Tower and Steel Erection	•	•	•	•	•		○	•	•	○	○	•	•	•	•	○	•
	Construction: Hardware Installation	•	•	•	•	•		○	•	•	○	○	•	•	•	•	○	•
	Construction: Stringing and connections	•	•	•	•	•		○	•	•	○	○	•	•	•	•	○	•
	Construction: Reinstatement/Rehabilitation	•	●	○	•	•		○	•	•	○	•	•	•	•	•	○	○
	Maintenance	•			•	•		•			•	•		•			•	
	Maintenance: Vegetation management	•			•	•		○			○	•		•	○	○	•	
	Operation: Energised Asset Operation	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Asset Removal or Replacement	•	○	○	•	•		●	○	○	○	•	○	•	○	○	●		
• No significant impact		○ Potential low impact		● Potential moderate to high impact														

The Environmental Aspect Matrix is a quick cross-reference table to identify what aspects need to be effectively managed at each stage of the project.

Management of environmental risks associated with works during the construction of new assets, refurbishing existing assets and maintaining/operating existing assets is to be carried out in accordance with Powerlink's procedure AM-PR-0045 Managing Environmental Risks (Obj. ref: A510304). This Procedure establishes responsibility for ensuring that environmental impacts have been considered and evaluated at an appropriate level for all activities. This procedure should also be read in conjunction with AM-POL-0019 Environmental Compliance Whole of Life for Powerlink Assets (Obj. ref: A530492) and AM-PR-0304 Determining the Level of Environmental Assessment for Powerlink Activities (Obj. ref: A530610).

4.1 *Cultural Heritage*

Powerlink resolves cultural heritage in accordance with the provisions and processes outlined in the *Aboriginal Cultural Heritage Act 2003* and *Queensland Heritage Act 1992*. As a result, specific cultural heritage management measures for the project may be developed to protect cultural heritage. These specific cultural heritage management measures are presented in other plans and documents and will be issued by the Powerlink Cultural Heritage team prior to commencement of any construction, maintenance or operational activities.

This Environmental Management Plan must be read in conjunction with any project specific cultural heritage management measures. It is worth noting that Environmental Management Plan does not replace or override such measures. An environmental management strategy has been prepared for cultural heritage to recognise and cross-reference these other documents and plans.

4.2 *Environmental Aspect Management*

Management measures to mitigate potential impacts on environmental aspects identified for the project have been prepared and are presented in Section 5.0 “Environmental Management Strategies”. Potential impacts associated with the project were identified in the Environmental Impact Statement for the Western Downs Substation.

During the construction, operational and maintenance phase of the project, there will be an ongoing process of monitoring, evaluation and review to enhance the Environmental Management Strategies to achieve continuous improvements in overall environmental performance in line with Powerlink’s environmental policy (refer to section 3.3).

5 Environmental Management Strategies

5.1 Air Quality

During construction activities, air quality impacts may arise as a result of traffic movements and emissions, unsealed access tracks, bulk earthworks and vegetation clearing. All impacts are expected to be short in duration and restricted to the localized area surrounding construction works. The operation of the substation is not expected to impact upon air quality. Maintenance activities are unlikely to cause a dust nuisance.

5.1.1 Policy

- o To prevent dust and other atmospheric emissions generated by preconstruction, construction, operation and maintenance activities from causing a hazard or nuisance to neighbouring landowners.
- o To comply with the *Environmental Protection Act 1994* and *Environmental Protection (Air) Policy 1997*

5.1.2 Performance Criteria

- o Compliance with the *Environmental Protection Regulation 1998* and *Environmental Protection (Air) Policy 1997*
- o To maintain acceptable limits of vehicular and machinery operating emissions, including dust, associated with construction activities (i.e. both on-site and vehicles transporting materials to and from the site)
- o Powerlink's procedure AM-PR-0917 Air Quality – Management and Control of Dust (Obj. ref: A596707)
- o No complaints regarding air quality or dust nuisance.

5.1.3 Preconstruction Phase

Implementation Strategy:

- o Restrict vehicle travelling speed (<40km/h) on unsealed access tracks, where possible (there is a direct correlation between speed and the amount of material that is released into the air)
- o Identify potential water sources for dust suppression during the construction phase. If water source extraction is required, the PEA will prepare and lodge applications where required
- o Obtain permits, where required, to extract water
- o Identify dust sensitive locations (e.g. residences) prior to construction activities occurring
- o The substation and connecting transmission lines are required to conform to the appropriate Australian Standards.

Monitoring and Auditing:

- o Not applicable to this phase.

Reporting:

- o Not applicable to this phase.

Corrective Action:

- o Not applicable to this phase.

5.1.4 Construction Phase

Implementation Strategy:

- o Carrying out activities in accordance with Powerlink procedure AM-PR-0917 Air Quality – Management and Control of Dust (Obj. ref: A596707)
- o Ensure that Powerlink notifies all adjacent landholders of the timing and sequence of Powerlink's construction activities
- o Ensure that vehicles and machinery will be fitted with appropriate exhaust systems and devices. Such devices will be maintained in good working order, in accordance with the manufacturer's recommendations
- o Watering of or application of dust suppressants to work areas and access tracks will be carried out on an as required basis to prevent dust nuisance
- o Restricting vehicles to approved access tracks, and only those vehicles required for the safe, efficient and essential construction activities will be allowed on the work area
- o Implement and ensure that all construction personnel to work in accordance with the Workplace Conduct for Powerlink Contractors (Obj. ref: A497976)
- o Cover all loose loads for transport to and from the work site
- o Maintain sealed public roads (i.e. Banana Bridge Road) free of trafficked soil materials. When required, sealed roads are to be swept regularly
- o Maintain stockpiles, for example stripped topsoil, in a condition which prevents wind blown dust generation. This may include watering or covering of the stockpiles
- o Limit bare earth exposure to that essential to the efficient and effective construction of the asset. Using vegetation cover, mulch covers or other suitable methods will be adopted where possible
- o Rehabilitate or allow natural regeneration of bare areas as soon as the area is no longer needed for construction
- o Restrict speed limits on off road access tracks to 40km/h. Vehicle speeds will be further reduced on unsealed access tracks during dry, windy weather, to a speed whereby visible dust emanating from soil type interaction is minimised
- o Time dust generating activities in proximity to dust sensitive locations (e.g. neighbouring dwelling), when possible, to prevent dust nuisance at the sensitive receptors. Consideration shall be given to local site conditions, including soil type, rainfall, wind speed and direction, proximity to receptors and duration of the activity
- o Where practicable, locate access tracks away from dust sensitive locations (e.g. neighbouring residence) to reduce likelihood of dust nuisance or complaint
- o Construct access tracks from materials which are more stable and less likely to turn to bull dust.
- o Cleared vegetation should be left in-situ (e.g. where appropriate to assist revegetation or erosion control), mulched and/or removed. If burning of cleared vegetation is planned, no burning is to occur unless permitted by the local fire warden. Permits for vegetation burning must be obtained and provided to the Powerlink Construction Manager/PEA prior to the burn. All conditions of any permit must be adhered to.

Monitoring and Auditing:

- o All site personnel will monitor condition of access tracks and work areas, and report to the PEA any areas where dust nuisance is likely to occur
- o The Environmental Issue Register shall be used to record and resolve any dust issues. The environmental issues register is to also provide corrective and preventative actions
- o The PEA and contractor are to carry out regular visual surveillance of vehicles, plant and equipment working or moving within proximity to residences or other dust sensitive locations. The surveillance is to determine when actions are required to reduce potential dust nuisance
- o Quantitative monitoring may be conducted to investigate a complaint, if required by an administering authority, to determine if dust levels comply with the performance criteria specified in this EMP.

Reporting:

- o All complaints received to be reported to the Powerlink Construction Manager or PEA immediately, and in writing within 24 hours

- o Actions taken to mitigate dust nuisance and complainants to be recorded as implemented, and reported on a monthly basis
- o All complaints recorded in the complaints register for the project (refer section 3.6 of this EMP). The resolution of the complaint will also be recorded
- o Any air quality observations or test results to be presented in the monthly compliance report
- o Any EMP non-compliances to be documented and reported to Powerlink Construction Manager
- o Summary of non-compliances, corrective actions and preventative actions to be recorded in the monthly compliance report
- o Any material or serious environmental harm to be reported to the Manager Environmental Strategies by the Powerlink Construction Manager.

Corrective Action:

- o If a dust complaint is received, the PEA will investigate and provide advice on measures to reduce the likelihood of further complaints
- o Review of the implementation strategies will be carried out following any complaint to determine their adequacy, and whether additional measures need to be implemented. Where further measures need to be implemented, these will be added to the EMP.
- o Corrective and preventative actions will be implemented, on an as needed basis, to address dust nuisance.

5.1.5 Operation and Maintenance Phase

Implementation Strategy:

- o Carrying out activities in accordance with Powerlink procedure AM-PR-0917 Air Quality – Management and Control of Dust (Obj. ref: A596707)
- o Maintain ground covers in accordance with surrounding land use and current groundcover vegetation levels
- o Restrict speed limits on off road access tracks to 40km/h. Vehicle speeds will be further reduced on unsealed access tracks during dry, windy weather, to a speed whereby visible dust emanating from soil type interaction is minimised
- o Coordinate activities generating dust or other atmospheric emissions to coincide with favourable climatic conditions
- o Cleared vegetation should be left in-situ (e.g. where appropriate to assist revegetation or erosion control), mulched and/or removed. If burning of cleared vegetation is planned, no burning is to occur unless permitted by the local fire warden. Permits for vegetation burning must be obtained and provided by the External Maintenance Service Provider prior to the burn. All conditions of any permit must be adhered to.

Monitoring and Auditing:

- o As specified for the Construction Phase and Complaints Management Procedure outlined in Section 3.6 of this EMP
- o Operation and maintenance activities will be monitored to ensure compliance with the performance requirements as specified in this Environmental Strategy or as frequently as necessary.

Reporting:

- o Any dust related complaints will be reviewed quarterly and reported to the Asset Manager
- o Actions taken to mitigate dust nuisance and complainants to be recorded and reported on a monthly basis
- o The SF6 in the substation will be added to Powerlink's inventory, and any release will be reported to the AGO as part of the Greenhouse Challenge program.

Corrective Action:

- o Any dust complaints received will be investigated and steps taken to reduce impact (refer to Section 3.6 of this EMP)
- o Corrective and preventative actions will be implemented, on an as needed basis, to address dust nuisance.

5.3 Biosecurity (inc. red imported fire ants)

Pest and weed species identified on site during the field investigations were recorded. The potential impacts associated with existing or potential weed or pest outbreaks can be mitigated and managed by adhering to strategies outlined below.

5.3.1 Policy

- o No introduction, release, movement or transportation of red imported fire ants or other pests and diseases declared under the *Plant Protection Act 1989*.
- o Compliance with Powerlink's *AM-PR-0039 Biosecurity Management – Pest and Pathogen Control Measures* (Obj. ref: A513014) and *AM-PR-0781 Fire Ant Management Plan* (Obj. ref: A582069).

5.3.2 Performance Criteria

- o No new pest or disease outbreaks observed on the project area.

5.3.3 Preconstruction Phase

Implementation Strategy:

- o Identify properties which have been mapped as restricted or quarantined by Biosecurity Queensland
- o Implement *AM-PR-0781 Fire Ant Management Plan* (Obj. ref: A582069) in relation to movement of high risk materials onto the substation site.
- o Implement any specific measures prescribed or nominated by Biosecurity Queensland in relation to the management of pests and diseases
- o Prepare, when required, pest/disease management plans for declared pests and diseases in restricted and quarantined areas
- o Prepare a local weed management plan (refer to Weed Management Strategy).

Monitoring and Auditing:

- o Monitoring for the presence of new outbreaks of pests and diseases
- o When required, monitoring will be conducted to ensure compliance with the Fire Ant Management Plan and any other specific requirements during entry, on and leaving properties.

Reporting:

- o Report any suspected pest or disease outbreaks to the Manager Environmental Strategies and Biosecurity Queensland
- o Record location of any pest or disease outbreaks.

Corrective Action:

- o Any new outbreaks forward to the Land Management Team for inclusion into the Powerlink's PQ Maps
- o Develop management measures for new outbreaks.

5.3.4 Construction Phase

Implementation Strategy:

- o Review land information databases prior to construction to determine current status of quarantined or restricted areas
- o Implement the pest/disease management plan
- o Implement *AM-PR-0781 Fire Ant Management Plan* (Obj. ref: A582069)
- o Implement the local weed management plan (refer to Weed Management Strategy).

Monitoring and Auditing:

- o Monitoring will be conducted to ensure compliance with the Pest/Disease Management Plan.

Reporting:

- o Report any suspected pest or disease outbreaks to the Manager Environmental Strategies and Biosecurity Queensland
- o Record location of any pest or disease outbreaks
- o Prepare and keep records required by the pest/disease management plan
- o Summary of non-compliances, corrective actions and preventative actions to be recorded in the monthly compliance report.

Corrective Action:

- o Any new outbreaks forward to the Land Management Team for inclusion into the Powerlink's PQ Maps
- o Update pest/disease management plans for new outbreaks.

5.3.5 Operation and Maintenance Phase

Implementation Strategy:

- o Refer to the implementation strategy of the construction phase of this Environmental Strategy.

Monitoring and Auditing:

- o Monitoring will be conducted to ensure compliance with the Pest/Disease Management Plan.

Reporting:

- o Report and suspected pest or disease outbreaks to the Manager Environmental Strategies and Biosecurity Queensland
- o Record location of any pest or disease outbreaks
- o Prepare and keep records required by the pest/disease management plan.

Corrective Action:

- o Any new outbreaks forward to the Land Management Team for inclusion into the Powerlink's PQ Maps
- o Update pest/disease management plans for new outbreaks.

5.4 Cultural Heritage

The proposed substation is not expected to impact upon areas or objects of social importance or non-indigenous cultural significance. Commonwealth and State heritage registers have not identified non-indigenous cultural heritage sites on or within the immediate vicinity of the Project site. With consideration of the broader context of the area surrounding the Project site (i.e. Kogan Power Station and agricultural pastures), the proposed development is not expected to have a negative impact on the lifestyle of local residents, or on the appeal of places frequently visited within the region. However, the likely presence of remnants of non-indigenous cultural heritage has not been dismissed.

5.4.1 Policy

- o Compliance with the *Aboriginal Cultural Heritage Act 2003* and *Queensland Heritage Act 1992*.

5.4.2 Performance Criteria

- o Provide effective recognition, protection and conservation of cultural heritage.

5.4.3 Preconstruction Phase

Implementation Strategy:

- o Contact Powerlink's Cultural Heritage Team prior to carrying out any works, for the cultural heritage management measures² which require implementation during the carrying out of such works
- o Development by Powerlink's Cultural Heritage Team of management measures (refer section 4.1 of this EMP) which meet Powerlink's obligations under the *Aboriginal Cultural Heritage Act 2003* and *Queensland Heritage Act 1992*.

Monitoring and Auditing:

- o Refer to the preconstruction implementation strategy.

Reporting:

- o Refer to the preconstruction implementation strategy.

Corrective Action:

- o Refer to the preconstruction implementation strategy.

5.4.4 Construction Phase

Implementation Strategy:

- o Refer to the cultural heritage requirements for construction phase of the project.

Monitoring and Auditing:

- o Refer to the cultural heritage requirements for construction phase of the project.

² Note: Specific preconstruction, construction, maintenance and operation cultural heritage management measures are not included in this EMP as they may vary depending on the nature, intensity and location of any works. Contact must be made with Powerlink's Cultural Heritage Team to ascertain the management measures to be implemented for the proposed works. Such specific preconstruction, construction, maintenance and operation cultural heritage management measures issued by Powerlink's Cultural Heritage Team must be read and implemented in conjunction with the requirements of this EMP.

Reporting:

- o Refer to the cultural heritage requirements for construction phase of the project.

Corrective Action:

- o Refer to the cultural heritage requirements for construction phase of the project.

5.4.5 Operation and Maintenance Phase

Implementation Strategy:

- o Refer to the cultural heritage requirements for maintenance and operational phase of the project.

Monitoring and Auditing:

- o Refer to the cultural heritage requirements for maintenance and operational phase of the project.

Reporting:

- o Refer to the cultural heritage requirements for maintenance and operational phase of the project.

Corrective Action:

- o Refer to the cultural heritage requirements for maintenance and operational phase of the project.

5.5 *Electric and Magnetic Fields (Interference Considerations)*

The EMF levels at the property boundaries of the two lots where the proposed substation site will be located (Lot 3 RP176346 and Lot 4 RP 176346) are expected to be quite low and comparable to those for small electrical appliances. The closest sensitive receiver is the house on Lot 1 RP175346, which is approximately 400m directly to the west of the proposed substation installation. As the proposed substation location has been setback from the boundary fence, the existing vegetation and distance will provide suitable separation between the publicly accessible areas and the electrical equipment.

5.5.1 Policy

- o To minimise the potential interference caused by electric and magnetic fields at nearby residences or facilities by:
 - o Appropriate separation distances between the asset and residences
 - o Use of latest technology to minimise interference effects (e.g. low surface voltage gradient on conductors, corona free support hardware, sectionalising, earthing).

5.5.2 Performance Criteria

- o No observable deterioration of radio or television signals received at nearby residences, particularly the residence on Lot 1 RP175346, directly to the west of the Project site
- o No perceptible (i.e. nuisance) electric shock effects from nearby metal structures
- o No reasonable or relevant complaints in relation to EMF.

5.5.3 Preconstruction

Implementation Strategy:

- During the design stage of the project, an appropriate separation distance of approximately 400m from the residence on Lot 1 RP176346 has been included to ensure no impact of EMF on this residence
- Design conductors, insulators, and hardware for minimal corona initiation
- Identify any adjacent metal structures to determine whether precautionary measures are needed.

Monitoring and Auditing:

- Where landholders raise concerns in relation to EMF interference, carry out sample measurements of TV and radio signal reception quality prior to substation commissioning for comparison after the asset is energised.

Reporting:

- Record concerns of landholders/residents and provide information on the impact of the asset on background EMF.
- Report detailing measurements carried out.

Corrective Action:

- Determine appropriate corrective actions where there is a difference in TV or radio signals at a residence between preconstruction and post-energising conditions.

5.5.4 Construction Phase

Implementation Strategy:

- Ensure that during construction / installation:
 - No burring or damage is caused to conductors or hardware
 - All related hardware (e.g. domed nuts etc.) is correctly installed
- Identify adjacent metal structures to determine whether precautionary measures (e.g. earthing) are needed and install precautionary measures as necessary.

Monitoring and Auditing:

- Random inspection of hardware and conductors
- Random checking of adjacent metal structures for implemented precautionary measures
- General surveillance for metal structures during routine inspections by the Powerlink Construction Manager or Inspectors.

Reporting:

- Any defects or damaged hardware or conductor are to be recorded routine inspections
- NCRs are issued by the contractor in relation to defects or damage. NCR to be addressed by the contractor.

Corrective Action:

- Defective hardware or conductor is to be replaced or repaired to ensure compliance with the construction specification.

5.5.5 Operation and Maintenance Phase

Implementation Strategy:

- o Identify newly installed metal structures to determine whether precautionary measures (e.g. earthing) are needed. Install precautionary measures, such as earthing, as necessary
- o Maintain the asset to reduce the likelihood of EMF interference
- o Confirm TV and radio reception at nearby residences to ensure reception quality is not impacted.

Monitoring and Auditing:

- o Monitor during routine inspections to confirm that precautionary measures (e.g. earthing) are installed at adjacent metal structures where an electric shock hazard could occur
- o Monitor for any encroachments or proposed developments adjacent to the substation.

Reporting:

- o Any potential hazards are to be recorded during routine inspections
- o Report any encroachments or proposed developments to the Land Management Team Leader
- o Report on any EMF interference complaints after commissioning of the substation to the resident EMF expert in Transmission Environment.

Corrective Action:

- o Implement precautionary measures, such as earthing, as required
- o Investigate EMF interference complaints and installed appropriate control measures, where necessary, to resolve the complaint
- o If required, upgrade antenna facility to reinstate TV or radio reception.

5.6 Electric and Magnetic Fields (Health Considerations)

Powerlink appreciates that transmission of electricity via the proposed substation has the potential to generate electrical and magnetic fields which have the potential to raise public health concerns. Whilst an assessment has been conducted which illustrates that exposure levels (even for the closest receptor at the residence on Lot 1 RP176346) are well below the ARPANSA Draft Standard and NHMRC limits of exposure, the following management arrangements should be undertaken to ensure Powerlink policy is met.

5.6.1 Policy

- o Prudent avoidance when determining substation sites. This approach recommends that unnecessary exposure to electric and/or magnetic fields should be avoided if this is feasible in terms of both cost and technical considerations.
- o Electric and magnetic field strengths for the proposed asset will be well below the exposure limits set down by the National Health and Medical Research Council for members of the general public³

³ The National Health and Medical Research Council (NHMRC) in 1989 issued interim guidelines for limitations of exposure to electric and magnetic fields (EMF), *Radiation Health Series No. 30 "Interim guidelines of exposure to 50/60 Hz electric and magnetic fields."* The NHMRC rescinded this publication in accordance with its policy of reviewing documents published more than 10 years ago. The Australian Radiation Protection and Nuclear Safety Agency (ARPANSA) has taken over responsibility of the review process for this publication.

In the absence of any other Australian guidelines, ARPANSA still refers to the NHMRC guidelines. In December 2006, ARPANSA released its own draft guidelines "*Exposure Limits for Electric & Magnetic Fields – 0 Hz to 3 kHz*" for public comment, with a final document expected in 2009. It is expected that the ARPANSA review, when finalised, will replace the NHMRC publication.

5.6.2 Performance Criteria

- o EMF attributable to the substation will not significantly increase, at adjacent residences, the background EMF levels normally found in any home using electricity
- o Owners are informed and educated about the EMF/ health issue
- o No reasonable or relevant complaints in relation to EMF.

5.6.3 Preconstruction Phase

Implementation Strategy

- o During the design stage of the project, an appropriate separation distance of approximately 400m from the residence on Lot 1 RP176346 has been included to ensure there is no impact of EMF on this residence
- o Configure phase conductors and circuits to produce the lowest practical possible EMF levels at the property and easement boundaries.
- o Provide EMF information to owners and adjacent residents and / or conduct magnetic field readings on request.

Monitoring and Auditing:

- o On request, measure, to allay concerns of residents in proximity to the asset, EMF levels in and adjacent to near residences before and after energising of the substation

Reporting:

- o A copy of any EMF readings taken or information sent to an owner is to be recorded in Objective.

Corrective Action:

- o Advise and consult with affected property owners to implement corrective action acceptable to both parties.

5.6.4 Construction Phase

Implementation Strategy:

- o Provide EMF information to owners and adjacent residents and / or conduct pre-energising and post-energising magnetic field readings on request.

Monitoring and Auditing:

- o Not applicable to this phase.

Reporting:

- o Report on any EMF health concerns to the resident EMF expert in Transmission Environment.

Corrective Action:

- o Not applicable to this phase.

5.6.5 Operation and Maintenance Phase

Implementation Strategy:

- o As specified for the Construction phase of this EMP.

Monitoring and Auditing:

- o As specified in the Construction phase of this EMP.

Reporting:

- o As specified by Section 3.5.

Corrective Action:

- o As specified in the Construction phase of this EMP

5.7 Energy Use/Greenhouse Gas

Powerlink appreciates that the construction, operation and maintenance of a substation result in greenhouse emissions through tree clearing (removal of carbon sink) and where liquid fossil fuels are used to transport materials and equipment for construction and operation. Energy (as both fuel and electricity generated from fossil fuels) is also consumed in the manufacture and production of the materials used, and can be considered to be 'embedded' in the final product. By recognising these links and accounting for them in the development phase; many of these contributions can be significantly reduced or eliminated through better planning and design decisions. The following management arrangements should be undertaken to reduce, where practicable, energy use and greenhouse gas emissions.

5.7.1 Policy:

- o To be more efficient in the use of resources in the construction, operation and maintenance of the substation and associated transmission line.

5.7.2 Performance Criteria

- o Energy use and waste generation is considered in all activities
- o The 'Environmental Footprint' is reduced wherever practicable.

5.7.3 Preconstruction Phase

Implementation Strategy:

- o Design the substation to be self-sufficient for water and also provide waste treatment facilities onsite.
- o Prepare a waste management plan which identifies measures to reduce, reuse and recycle materials generated by the construction. The waste management plan is to establish a preferred waste management hierarchy and develop principles for achieving good waste management in accordance with the *Environmental Protection (Waste Management) Policy 2000*
- o Reduce to the maximum extent the amount of waste produced during the preconstruction phase
- o Use, where appropriate, telephone hook-ups/ video-conferencing in preference to driving for face to face meetings.

Monitoring and Auditing:

- o Not applicable for this stage.

Reporting:

- o Not applicable.

Corrective Action:

- o Identified opportunities should be incorporated into future projects as part of a process of continual improvement.

5.7.4 Construction Phase

Implementation Strategy:

- o Induct all site personnel on general measures to reduce energy use and emissions associated with the construction activities
- o Implement the waste management plan, including clear segregation and collection of materials fit for reuse
- o Minimise vegetation clearing to that only essential for the effective, efficient and safe operation of the substation and associated transmission line
- o Turn off plant, equipment and vehicles not in use to prevent unnecessary idling
- o Burning of waste, other than cleared vegetation permitted by the local fire warden, is not to occur
- o Limit the number of vehicles used to that essential for efficient construction activities. Car pooling for visits to work sites should occur to reduce the number of vehicle movements associated with the project.
- o Schedule delivery truck movements, where possible, such that delivery trucks can backload waste or excess construction materials to reduce the number of truck movements on the project
- o Investigate backloading for delivery of materials where feasible
- o Implement a process to reduce the likelihood or amount or rework
- o Restricting the number of plant and equipment movements by ensuring, wherever possible, that all staged works are completed prior to departure from the work area
- o Use, where appropriate, telephone hook-ups/ video-conferencing in preference to driving for face to face meetings.

Monitoring and Auditing:

- o General surveillance of construction activities for the implementation of this strategy
- o General surveillance to ensure that unnecessary construction activities are not being carried out.

Reporting:

- o Include in the monthly compliance report, initiatives employed to meet the requirements of this strategy
- o Report on a quarterly basis, initiatives implemented during the construction phase to reduce the 'environmental footprint' of activities
- o Report unnecessary construction activities to the Powerlink Construction Manager and resolve such works with the contractor.

Corrective Action:

- o Identify additional opportunities, and implement measures where practicable to reduce waste from foundations, tower erection and stringing activities
- o Remind all site personnel the requirement to reduce, where possible, the 'environmental footprint' of construction activities
- o Identify opportunities to be incorporated into future projects as part of a process of continual improvement.

5.7.5 Operation and Maintenance Phase

Implementation Strategy:

- o Induct all site personnel on general measures to reduce the 'environmental footprint' of operation and maintenance activities
- o Consider the waste management hierarchy when carrying out operation and maintenance activities
- o Identify opportunities to reduce number of routine inspections by combining with other activities where possible
- o Turn off plant, equipment and vehicles not in use to prevent unnecessary idling
- o Burning of waste, other than cleared vegetation permitted by the local fire warden, is not to occur
- o Limit the number of vehicles used to that essential for efficient operational activities. Car pooling to work sites should occur to reduce the number of vehicle movements associated with the project
- o Schedule delivery truck movements, where possible, such that delivery trucks can backload waste or excess construction materials to reduce the number of truck

- movements on the project
- o Restricting the number of plant and equipment movements by ensuring, wherever possible, that all staged works are completed prior to departure from the work area
- o Use, where appropriate, telephone hook-ups/ video-conferencing in preference to driving for face to face meetings.

Monitoring and Auditing:

- o General surveillance of construction activities for the implementation of this strategy
- o General surveillance to ensure that unnecessary construction activities are not being carried out.

Reporting:

- o Include in the monthly report, initiatives employed to meet the requirements of this strategy
- o Report on a quarterly basis, initiatives implemented during the operation and maintenance phase to reduce the 'environmental footprint' of activities
- o Report unnecessary construction activities to the Construction Manager and resolve such works with the contractor.

Corrective Action:

- o Identify additional opportunities, and implement measures where practicable to reduce waste from operation and maintenance activities
- o Remind all site personnel the requirement to reduce, where possible, the 'environmental footprint' of activities
- o Identify opportunities to be incorporated into future projects as part of a process of continual improvement.

5.8 Erosion and Sediment Control

Field investigations have illustrated that soils on site have been identified as having/being:

- low salinity in the surface, increasing with depth;
- low nutrient status; and
- sodic in the surface and strongly sodic in the subsoils.

Because of these characteristics, there are two primary issues that need to be dealt with in regards to soil erosion due to sodic soils on the project site. Firstly, there is a need to reduce the risk that erosion of the subsoils occurs due to construction activities. Secondly, there is a need to repair the erosion that already exists on the site. Mitigation and management measures to assist reducing the risk and repair current erosion which exists on site are described below.

5.8.1 Policy:

- o All Erosion and sediment control to be consistent with the International Erosion Control Association (2008) *Best Practice Erosion and Sediment Control for Building and Construction Sites (Australasia)*
- o To comply with the *Environmental Protection Act 1994*, *Environmental Protection (Water) Policy 1997* and *Water Act 2000*.

5.8.2 Performance Criteria

- o All sites are stable.
- o No new tunnel and gully erosion resulting from Powerlink's activities within and adjacent to the project area
- o No deterioration in water quality in creeks or drainage lines caused by erosion from the project area
- o No release of untreated water to roadside gutter, stormwater drain or to water

- o Suitable vegetative cover or erosion and sediment controls in work areas
- o Powerlink's *AM-POL-0830 Erosion and Sediment Control* (Obj. ref: A517)
- o No complaints or reports of significant erosion or downstream sedimentation as a result of Powerlink's activities
- o Where quantitative monitoring of discharge water quality is required (such as in response to an inquiry from a statutory authority or in investigating a complaint), contamination levels of stormwater discharged through runoff from work areas, dewatering of holes or pits to the drainage system will meet the following nominated targets:
 1. Turbidity <20NTU.
 2. pH 6.5 – 8.5
 3. Dissolved Oxygen ≥6.5mg/L
 4. No visible debris or hydrocarbons.

5.8.3 Preconstruction Phase

Implementation Strategy:

- o Implement erosion and sediment control measures which will be effective in controlling sediment from sodic/saline soils present on site (high erosion potential/dispersive soils)
- o Due to the flat nature of the site no areas have been identified which would be subject to landslip or mass slope movements
- o Develop an Erosion and Sediment Control Plan (ESCP) and determine rehabilitation requirements. These ESCPs may include access track sketches and site work plans and show temporary and permanent erosion controls. The ESCP should:
 - o Identify temporary and permanent measures to ensure the short, medium and long term stability of the site
 - o Identify drainage patterns and discharge points
 - o Nominate the location and extent of erosion and sediment controls, for each stage of construction.
 - o Provide for cost effective solutions to the management erosion and sediment
 - o Establish performance and design standards for the sediment and erosion controls
 - o Provide flexibility and allowance for future upgrades and amendments
 - o Include details of the maintenance of the controls, and when the controls can be removed.

The ESCP should also meet the requirements of Develop an Erosion and Sediment Control Program according to International Erosion Control Association (IECA) (A) Guidelines.
- o Locate, where practicable, substation pads outside existing erosion areas
- o Check status of land on the contaminated land register or environmental management register to ensure no special controls are required.

Monitoring and Auditing:

- o Not applicable to this phase

Reporting:

- o Report and record any identified sodic or saline soils on the project to the PEA.

Corrective Action:

- o Not applicable to this phase

5.8.4 Construction Phase

Implementation Strategy:

- o Carry out all activities in accordance with Powerlink's *AM-POL-0830 Erosion and Sediment Control* (Obj. ref: A517).
- o Implement the requirements of the ESCPs for each stage of construction. Install devices, when possible, prior to soil disturbance from construction activities.
- o Maintain all temporary erosion control measures until the site is stabilised.
- o Maintain access tracks in good condition. Adequate erosion and sediment controls will be installed to reduce the likelihood of track deterioration and soil tracking. Tracks to be designed to cater for substation movements.
- o The entire site has been identified as having high erosion potential due to the sodic nature of subsoils. Develop specific work plans prior to soil disturbance to ensure soils are not exposed to concentrated water flows from work areas. These work plans will detail the controls/methods to be deployed to reduce the potential for erosion and downstream sedimentation. The PEA will provide advice on the controls required for high erosion potential areas.
- o Soil ameliorants that may be required for soil stabilisation (gypsum to counteract sodicity), and revegetation (fertiliser rates) are recommended at the following rates (15t/ha gypsum, 45 kg/ha MAP). All soil is to be treated with gypsum.
- o Topsoil to approximately 100mm should be stripped separately, treated and used for revegetation. Preserving topsoil is important.
- o All soil should be capped with treated topsoil and revegetated.
- o Provide on sites where there is potential for downstream sedimentation, sediment fences, maintenance of vegetative buffers, mulch berms and other sediment controls down slope of the work area. Maintain and install the controls in accordance with the IECA (A) Guidelines.
- o Consult with Powerlink prior to any modification or removal of sediment and erosion control structures, to determine alternative controls and timeframes for reinstatement.
- o Direct all uncontaminated (clean) stormwater to stable land, ensuring that water is dispersed/diffused to prevent erosion.
- o Where topsoils are disturbed and subsoils exposed they should be covered with topsoil and rehabilitated as soon as practicable on completion of pads.
- o Stabilise pad surfaces using methods such as topsoiling and revegetation or graveling, where there is a risk of erosion of the pad.
- o Carry out clearing activities in and within 50 metres of a watercourse and development of creek crossings only in accordance with the *Powerlink Guideline for Activities in a Watercourse or Lake for Destroying up to 0.25 Ha of Vegetation, Excavating up to 500m³, and Placing up to 500m³ of Fill* (Obj. ref: A471789).
- o Minimise, where practicable, disturbance to ground cover and topsoil disturbance in erosion prone areas and steeply sloping areas during clearing activities. Determine appropriate clearing methods for moderate to high erosion prone and steep areas so that the clearing methods minimises soil disturbance and potential for soil loss. Consideration should also be given to those clearing methods which reduce damage to ground covers.
- o Maintain grass cover in the site and work areas to the maximum practicable extent. Reduce damage to grass cover by limiting vehicle movements to work areas and approved access tracks.
- o While it is unlikely that groundwater will be intercepted, a dewatering plan or work procedure should be prepared and implemented for dewatering of rainwater filled excavations. The contractor/person carrying out the works is to prepare this plan/procedure. The dewatering plan/procedure should consider the following:
 - o Measures to avoid the accumulation of water in pits, trenches and foundations.
 - o Design standards for settling ponds/sediment traps and verification that the pond/traps meet this nominated design standard (only relevant to sites where settling structures have been installed).
 - o Triggers for dewatering (e.g. to maintain free storage capacity in a pond for future storm events, to allow pouring of foundations, reinstatement of settling ponds post construction etc)
 - o If trigger levels occur, what decision making process will be adopted to determine the suitable method for dewatering considering:
 - the receiving environment
 - quality and quantity of the water
 - location and accessibility
 - requirements of this EMP and statutory requirements.

- Recording and monitoring details required by the dewatering management plan/work procedure. This may include, but not necessarily limited, to approved copies of dewatering processes, dates when dewatering occurred, photographs, water quality monitoring (qualitative or quantitative), rainfall records and persons conducting dewatering.
- Keep Banana Bridge Road clean and free of sediment. Tracking of soil onto local roads will be prevented by:
 - Limiting off road vehicle movements after rainfall events to that essential for efficient and safe construction activities.
 - Installing in areas with problematic soil types, a rock rumble pad or similar device in accordance with the IECA (A) Guidelines near the intersection of the access track and the sealed road.
 - Providing brush down equipment to remove loose soil from wheels, wheel arches, tracks, augers and under bodies.
 - Limiting access during and immediately after wet weather, when access tracks may be severely damaged by vehicle movements and there is a high possibility of the transport of soil materials onto sealed public roads.
- Limit area and duration of exposed soil to that essential for safe and efficient construction activities.
- Retain sediment fences and other temporary erosion and sediment controls in place and maintain until the site has been successfully stabilised. On successful stabilisation, the temporary controls will be removed. For example, temporary sediment controls will be removed from below batters when successful revegetation of the batters is achieved (viz. nominal 70% ground cover established on batters – where the preconstruction environment has less than 70% ground cover, the ground over establishment target will be similar to that which existed prior to construction).
- Ensure fill used for pads are to be compacted in 200mm layers to prevent subsidence, slippage (bulk soil loss) and change in drainage patterns.
- Provide concrete washout pit on site for the washing of concrete tools and agitator truck chutes. This washout pit will be installed such that runoff from areas outside the pit is not allowed to enter the pit and the pit will not discharge in a rainfall event. The washout pit will also be fenced using temporary bunting or covered when not in use to prevent access by local children and/or domestic animals. On completion of foundation activities, the concrete washout pit will be cleaned out, backfilled and reinstated.
- Energy dissipaters/level spreaders should be installed on permanent discharge points to prevent concentrated flows.
- Store fuels oils and chemicals on-site in accordance with relevant Australian Standards and Fire Safety regulations (e.g. plastic lined earthen bund, portable bunds, appropriate spill kits present, etc).

Monitoring and Auditing:

- The Environmental Issue register shall be used to record and monitor any erosion or sediment control issues. The environmental issues register is to also provide corrective and preventative actions.
- Visual assessment of presence and effectiveness of erosion and sediment control structures and measures, particularly following significant rainfall events (>20mm in 24 hours).
- Monitoring condition and capacity of sediment fences.
- Visual assessment of the condition of adjacent local roads.
- Reviewing adequacy of installed erosion and sediment controls.

Reporting:

- Observations to be recorded in the monthly compliance report.
- Any water quality test results to be recorded in the monthly compliance report.
- Any EMP non-compliances to be documented and reported to Construction Manager.
- Summary of non-compliances, corrective actions and preventative actions to be recorded in the monthly compliance report.
- Any material or serious environmental harm to be reported to the PEA.

- o ESCP, Rehabilitation Plans, Dewatering Plans and Site Work Plans/Benching Plans to be prepared and registered in objective.

Corrective Action:

- o Existing erosion and sediment structures to be re-instated or repaired.
- o Clean affected roadways using a road sweeper or brooms and shovels
- o Review of adequacy of stormwater management measures, and install additional measures were required.
- o Repair any damaged access tracks.
- o Desilt sediment control devices when the 50% capacity of the device is reached.
- o Remove sediment fences when reinstatement of the disturbed area has been successful.

5.8.5 Operation and Maintenance Phase

Implementation Strategy:

- o Prepare Erosion and Sediment Control Plans for activities which result in soil disturbance.
- o Prepare a dewatering plan/work procedure for activities which cause trenches, pits or ponds to be created.
- o Keep to approved access tracks.
- o Carry out maintenance activities in and within 50 metres of a watercourse in accordance with the *Powerlink Vegetation Control Standard AM-STA-0834* (Obj. ref: A62955) and *Powerlink Guideline for Activities in a Watercourse or Lake for Destroying up to 0.25 Ha of Vegetation, Excavating up to 500m3, and Placing up to 500m3 of Fill* (Obj. ref:A471789).
- o Maintain erosion control measures until the site is stabilised.
- o Maintain all permanent erosion control structures in good working order.

Monitoring and Auditing:

- o During routine maintenance inspections, identify areas where erosion is occurring and where corrective action is required.
- o All remaining erosion control measures should be monitored for their effectiveness for at least 12 months. Remedial measures should be put in place should any controls fail.
- o Ensure that access tracks do not channel water directly into watercourses, but are designed and graded to ensure run-off is filtered through vegetated areas.

Reporting:

- o Advise relevant maintenance crews of any erosion and sediment control issues
- o Report damage to access tracks or other assets to the Easement Maintenance Manager.
- o Any material or serious environmental harm to be reported to the Manager Environmental Strategies.
- o As specified in Section 3.5 of this EMP.

Corrective Action:

- o Stabilise areas where erosion has occurred or is likely to occur and install/maintain appropriate devices to reduce the potential of further erosion occurring.

5.9 Fauna

Construction activities for the substation and associated road infrastructure will require the clearing of both non-remnant and remnant vegetation which may have a direct impact on terrestrial fauna. Vegetated portions of the proposed substation site have potential to provide excellent cover and resources for local fauna and forest dependent species. Whilst no threatened species were recorded on site during the field survey, background searches suggest that the site may potentially provide suitable habitat for several threatened species

(See Section 10 of the EIS). Whilst it is understood that ultimately 70ha may be cleared for the development of the substation site, the remaining remnant and regrowth vegetation on the two lots should be managed to reduce further disruption of fauna on site.

5.9.1 Policy

- o To minimise the impacts on fauna that are likely to arise from construction, operation and maintenance activities

5.9.2 Performance Criteria

- o Minimal disturbance to fauna
- o No fauna injured or killed
- o Habitat retained where possible across the substation site

5.9.3 Preconstruction Phase

Implementation Strategy:

- o Identify opportunities to maintain vegetation links to reinforce habitat connectivity across Lots 3 and 4 RP176346 and to the mapped remnant vegetation to the north.
- o Substation to be positioned to reduce impacts to habitat and minimise harm to wildlife.
- o Retain habitat trees where practical, where the habitat trees will not impact on the safe and secure operation of the substation.
- o No fauna listed under the *Environmental Protection, Biodiversity and Conservation Act 1999* were recorded during field assessments however if listed species are identified, development of species specific strategies to minimise impact on such fauna should be undertaken.
- o Identify local fauna carers and fauna associations, who may be able to provide fauna services if required.
- o Identify any areas of significance which will require specific attention (areas of sensitivity), on the EWP.

Monitoring and Auditing:

- o Not applicable to this phase

Reporting:

- o A Vegetation Management Plan (VMP) should be prepared for the site to address clearing and protection of habitat vegetation on the site.

Corrective Action:

- o Not applicable to this phase

5.9.4 Construction Phase

Implementation Strategy:

- o Induct all site personnel on importance of minimising impacts on native fauna, and the requirements of this EMP.
- o Habitat trees on site should be identified (e.g. trees containing nests or hollows) using a suitably trained person such as trained PEA, spotter catcher or ecologist, and retained if they will not impact on the safe and secure operation of the substation.
- o Areas to be cleared should be surveyed by a spotter catcher or ecologist within 24 hours prior to clearing to identify habitat trees that could be occupied by fauna. These trees should be clearly marked and retained during the clearing phase until fauna has had the opportunity to move into nearby habitat on their own accord.
- o Measures to manage the habitat trees are to be prepared and adopted, where practicable, to minimise fauna impacts.

- o No barbed-wire or electric fencing should be used during construction.
- o Construction activities should be restricted to the hours between 6.30am and 6.30pm to reduce potential impact on nocturnal fauna.
- o Clearing should be undertaken in the presence of a fauna spotter/catcher. Carry out clearing methods, on advice of the ecologist/spotter catcher/PEA and clearing contractor to minimise harm to fauna. For example, if the tree requiring removal is occupied by native fauna, considerations should be given to leaving the tree in place until any juveniles present in the tree are fledged or have left hollows.
- o Prohibit the burning of cleared vegetation unless such fires are permitted by the local fire warden. Should burning of cleared vegetation be undertaken, permits for vegetation burning must be obtained and provided to Powerlink prior to the burn. All conditions of any permit must be adhered to.
- o Implement Powerlink's *AM-POL-0050 Vegetation Management for Transmission Corridors and Sites* (Obj. ref: A462945) and *AM-STA-0834 Vegetation Control Standards* (Obj. ref: A462955)
- o Where necessary or specifically required, compensate for habitat loss by including nesting boxes or placing recovered hollows adjacent to cleared areas.
- o Implement measures to recover and rehabilitate injured or orphaned native animals unavoidably impacted by clearing and construction activities.
- o Obtain necessary permits and approvals for any nest removal (with the exception of Corvid species).
- o All vehicles, except in the event of an emergency, should be restricted to designated access tracks with a maximum speed limit of 40km/hr to prevent collision with fauna.
- o Signs should be erected to notify speed limits and potential presence of wildlife.

Monitoring and Auditing:

- o Monitoring will be conducted to ensure compliance with the Performance Criteria and Implementation Strategies specified in this EMP.

Reporting:

- o Clearing fauna reports will be prepared documenting fauna species identified during clearing and measures deployed to minimise impacts on the identified fauna.
- o Summary of non-compliances, corrective actions and preventative actions to be recorded in the monthly compliance report.

Corrective Action:

- o Ensure above implementation strategies are in place
- o Review and amend implementation strategies if necessary
- o Significant habitats discovered during the construction phase managed in accordance with the EMP.
- o New fauna discoveries, such as listed under the *Environmental Protection, Biodiversity and Conservation Act 1999* or *Nature Conservation Act 1992*, reported to the TEPM and appropriate management strategies for the fauna discovery prepared.

5.9.5 Operation and Maintenance Phase

Implementation Strategy:

- o As specified in the construction phase of this EMP

Monitoring and Auditing:

- o Monitoring will be conducted to ensure compliance with the Performance Criteria and Implementation Strategies specified in this EMP.
- o As specified in the construction phase of this EMP

Reporting:

- o In accordance with Section 3.5
- o As specified in the construction phase of this EMP

Corrective Action:

- o Ensure above implementation strategies are in place
- o Implementation strategies to be reviewed and amended where necessary
- o New fauna discoveries, such as listed under the *Environmental Protection, Biodiversity and Conservation Act 1999* or *Nature Conservation Act 1992*, reported to the TEPM and appropriate management strategies for the fauna discovery prepared.

5.10 Hazardous Materials

Hazardous materials may need to be utilised during the construction and operation of the Substation. Hazardous materials need to be stored, handled and disposed of in the correct manner to minimise potential harm. The following should be adhered to in order to help reduce/eliminate potential harm.

5.10.1 Policy

- o To ensure correct storage, handling, transport and disposal of hazardous materials and waste in accordance with *Environmental Protection Act 1994*, *Environmental Protection (Waste Management) Policy 2000*, *Dangerous Goods Safety Management Act 2001*, *AS 1940: 2004 The storage and handling of flammable and combustible liquids*, *Workplace Health and Safety Act 1995*, *Workplace Health and Safety Regulation 1997*, *Carriage of Dangerous Goods by Road Act 1984* and *Carriage of Dangerous Goods by Road Regulation 1989*

5.10.2 Performance Criteria

Performance Criteria:

- o Chemicals stored, handled and disposed of in accordance with legislative requirements, Australian Standards and the MSDS.
- o No contamination of land or water as a result of a spill.
- o No new lands recorded on the Contaminated Lands Register.
- o Powerlink's procedure AM-PR-0926 Management, Transport and Disposal of Waste Insulating and Petroleum-Based Liquids (Regulated Wastes) (Obj. ref: A598354)

5.10.3 Preconstruction Phase

Implementation Strategy:

- o Prepare an Emergency Response Plan for construction activities (the contractor will prepare such plans where the works are contracted out). It should include procedures to ensure the correct storage, handling and transport of hazardous materials, and proposed response to accidental spills and contamination incidences.
- o Obtain approval from landholders for the application of chemicals (e.g. herbicides) on their land.

Monitoring and Auditing:

- o Not applicable to this phase

Reporting:

- o Complete landholder consultation records for clearing and access works.

Corrective Action:

- o Not applicable to this phase

5.10.4 Construction Phase

Implementation Strategy:

- o Carry out activities in accordance with Powerlink's procedure AM-PR-0926 Management, Transport and Disposal of Waste Insulating and Petroleum-Based Liquids (Regulated Wastes) (Obj. ref: A598354)
- o Ensure hazardous materials are not stored or allowed to drain onto the ground.
- o Implement measures to prevent hazardous material entering watercourses.
- o Transport, handle and store all oils and chemicals in accordance with the relevant Australian Standards (including secure storages). Temporary bunds may include earthen bund lined with plastic sheeting or portable plastic trays. Long term and permanent storages will be installed with Australian Standard and statutory requirements, and capture devices will have a capacity of at least 110% the volume of the maximum chemical storage capacity of the facility.
- o Prohibit the refuelling of vehicles and machinery within 100m of a watercourse or open drain and when possible all refuelling will be off-site at an approved refuelling station (e.g. service station).
- o Maintain machinery in accordance with manufacturer's recommendations/servicing schedules.
- o Keep Material Safety Data Sheets (MSDS) for each chemical used on-site.
- o Ensure MSDS are kept at a location that is easily accessible by all site personnel.
- o Maintain records for chemical inventory and storage locations.
- o Train all site personnel on safety and response procedures during site inductions.
- o Ensure materials and equipment (viz. spill kit) required to respond to a hazardous spill are to be on site at all times when hazardous materials are being used, transported, loaded or unloaded.
- o Ensure waste material will be disposed of appropriately and in accordance with the requirements of the Environmental Protection (Waste Management) Policy.
- o Handle spoil from land on the contaminated land register or environmental management register in accordance with the Environmental Protection Act and its regulations. Where possible, spoil generated on land identified as being contaminated will be kept on the listed parcel of land, stabilised and rehabilitated. Spoil in such cases will not be placed in flood plains, or within 100m of a water course.

Monitoring and Auditing:

- o Monitoring will be conducted to ensure compliance with the Performance Criteria and Implementation Strategies specified in this EMP.
- o The PEA will carry out monthly inspection of contractor's records and registers to ensure compliance with the requirements of the EMP.

Reporting:

- o Spill Register to be kept on site for all spills.
- o MSDS for all chemicals to be retained on site in a MSDS register.
- o Incident report to be issued for all spills greater than 10 litres, or any other volume nominated by the PEA.
- o All spills of chemicals or hydrocarbons on-site, regardless of amount or nature of the spill, are to be reported to the PEA.
- o Spills with a clean up costs greater than \$5000 will be reported to the Manager Environmental Strategies by the PEA.
- o Summary of spills, non-compliances, corrective actions and preventative actions to be recorded in the monthly compliance report.

Corrective Action:

- o Spills to be remediated depending on nature of product (the Manager Environmental Strategies will advise correct procedure). Immediate action should include:
 - o Small Hydrocarbon Spill (<10L) Apply absorbent material.

- o Large Hydrocarbon Spill (>10L). Install containment (e.g. block drains, surround with sandbags, dig earthen bund) and apply absorbent material.
- o Chemical Spill Application of appropriate absorbent material and containment.
- o All spills will be managed as follows:
 1. Stop the equipment causing the spill (only when safe to do so)
 2. Ensure appropriate PPE is worn (refer to MSDS).
 3. Isolate the spill at the point of the release (only when safe to do so)
 4. Use devices of containers to prevent the further spread of spill (only when safe to do so).
 5. Report the spill to PEA. The contractor must notify Powerlink of any spill within 24 hours – and immediately for any major spills of more than 50L.
 6. Remove the entire spill including contaminated soil and place into a suitable, sealable containment device ready for removal from site.
 7. If the spill is hydrocarbon based, the contaminated soil is to be removed off site and disposed of in accordance with legislative requirements. If another chemical has been released, the contaminated soil is to be disposed off in accordance with the MSDS or at a facility approved to receive such waste. . Contractor will identify this facility in the CEMP prior to construction commencing.
 8. The equipment causing the spill is not to be used until repaired to prevent further spills. Only minor repairs are permitted onsite (e.g. replacing a blown hydraulic hose). For any major repairs, equipment is to be removed offsite, however, minor/temporary repairs should be carried out to prevent further spills either onsite or during transit to a service facility.
 9. Investigate and prepare an incident report/log in the spill register. Incident reports to be prepared for any spill greater than 2 litres, or any other volume nominated by the PEA. Any incident report prepared will identify the causal factors, document corrective actions and nominate preventative actions to prevent a re-occurrence.

5.10.5 Operation and Maintenance

Implementation Strategy:

- o As specified for the Construction Phase of this EMP
- o Compliance with Powerlink's Policy AM-POL-0076 Management of insulating and petroleum based liquid spills (Obj. ref: A520843)

Monitoring and Auditing:

- o Monitoring will be conducted to ensure compliance with the Performance Criteria and Implementation Strategies specified in this EMP

Reporting:

- o As specified by Section 3.5 of this EMP

Corrective Action:

- o Immediate containment and clean up of spilt material. Contaminated material is to be remediated or disposed of at a licensed disposal facility.

5.11 Land Contamination

A search of the Contaminated Land Register/Environmental Management Register has determined that the site is not registered. A visual site inspection of the project site was conducted on 10 September 2009. The observation made during the inspection was that there appeared to have been no identifiable contaminating activities conducted on the land parcel.

5.11.1 Policy

- o Compliance with the *Environmental Protection Agency Draft Guidelines for the Assessment and Management of Contaminated Land* and Powerlink's AM-PR-0841 *Identification and Management of Contaminated Land 2006* (Obj. ref: A587980) and *Corporate Emergency Management Handbook* (Obj. ref: A547611)

5.11.2 Performance Criteria

- o No spillage or leaks of hazardous materials
- o No contamination of land or waters as a result of a spill and no new lands recorded on the Contaminated Lands Register.
- o No movement of contaminated material offsite without the relevant approval/permit/tracking.
- o Powerlink's procedure AM-PR-0926 Management, Transport and Disposal of Waste Insulating and Petroleum-Based Liquids (Regulated Wastes) (Obj. ref: A598354)

5.11.3 Preconstruction Phase

Implementation Strategy:

- o Carry out searches of Contaminated land status prior to carrying out of any activities.

Monitoring and Auditing:

- o Not applicable to this phase

Reporting:

- o Not applicable

Corrective Action:

- o Not applicable to this phase

5.11.4 Construction Phase

Implementation Strategy:

- o Carry out activities in accordance with Powerlink's procedure AM-PR-0926 Management, Transport and Disposal of Waste Insulating and Petroleum-Based Liquids (Regulated Wastes) (Obj. ref: A598354)
- o Search Powerlink's PQ Maps and property register prior to the start of any soil disturbing activities to identify if the land is on the CLR or EMR.
- o Retain, wherever possible, any excavated soil or other earthen material on site.
- o For any significant quantities of soils contaminated by spills and requiring off site disposal, analysis of the soil (or other earthen material) may be required to enable an application for a disposal permit to be made.
- o Cease work if potential land contamination is discovered (evidence to suggest potential contamination may be oil staining, buried waste or surrounding land-use). Work to only resume after appropriate site management measures are prepared and implemented.
- o Cease work, when activities or actions have the potential to cause land contamination.
- o Investigations of the nature, extent and source of the contamination may be required. This may include further control measures to manage contaminated materials.

Monitoring and Auditing:

- o Monitoring will be conducted to ensure compliance with the Performance Criteria and Implementation Strategies specified in this EMP

Reporting:

- o The PEA will document the management of contaminated soil for the project. Disposal receipts/waste tracking records to be collated and kept by Powerlink.
- o Any land which has a spill which may result in the registering the land parcel on the Contaminated Land Register will be reported to the Manager Environmental

- Strategies.
- o Summary of non-compliances, corrective actions and preventative actions to be recorded in the monthly compliance report.

Corrective Action:

- o Ensure above implementation strategies are in place
- o Review and amend Implementation strategies if necessary
- o Implement management strategies appropriate to the nature of the contamination where a discovery is made.

5.11.5 Operation and Maintenance Phase

Implementation Strategy:

- o Carry out activities in accordance with Powerlink's procedure AM-PR-0926 Management, Transport and Disposal of Waste Insulating and Petroleum-Based Liquids (Regulated Wastes) (Obj. ref: A598354)
- o Obtain necessary approvals/permits, should soil materials require removal from land on the CLR or EMR. Contact the PEA to arrange the necessary approvals/permits.
- o Stop work if potential land contamination is discovered (evidence to suggest potential contamination may be oil staining, buried waste or surrounding land-use).
- o Stop work, if activities have the potential to cause land contamination.

Monitoring and Auditing:

- o Monitoring will be conducted to ensure compliance with the Performance Criteria and Implementation Strategies specified in this EMP

Reporting:

- o Report any suspected land contamination to the Environmental Officer and Manager Environmental Strategies.

Corrective Action:

- o Ensure above implementation strategies are in place
- o Review and amend Implementation strategies if necessary

5.12 Noise and Vibration

Impacts to the ambient noise and vibration levels as a result of the proposed development are expected to be minimal. One noise sensitive receptor (dwelling) has been identified approximately 400m to the west of the Project site. Construction of the substation may produce short-term increases in noise and vibration as a result of earthworks, machinery traffic etc. However, these impacts will be localized and of short duration and could be minimized through the implementation of appropriate mitigation strategies. During the operational phase, the transformer units of the substation can produce a low-level noise or hum. Noise created during the operation phase is not expected to result in a significant increase of the current ambient noise levels.

5.12.1 Policy

- o Compliance with the *Environmental Protection (Noise) Policy 1997*
- o Compliance with the *Environmental Protection Regulation 1998*

5.12.2 Performance Criteria

- o No noise/vibration complaints received

- o Consultation with community and relevant Government Agencies

5.12.3 Preconstruction Phase

Implementation Strategy:

- o Appropriate standards of professional behaviour to be maintained at all times (e.g. no bad language or yelling).
- o Operate vehicles in a manner which gives consideration to other road users and minimises the impact of traffic noise on potentially sensitive areas.
- o Implement Workplace Conduct for Powerlink Contractors (Obj. ref: A497976).

Monitoring and Auditing:

- o Not applicable to this phase.

Reporting:

- o Not applicable to this phase

Corrective Action:

- o Not applicable to this phase.

5.12.4 Construction Phase

Implementation Strategy:

- o Notify all landholders which may be affected by noisy activities of the timing and sequence of Powerlink's construction activities.
- o Ensure that machinery is fitted with appropriate noise attenuation devices, and will be maintained in accordance with manufacturer's recommendations.
- o Ensure construction noise at sensitive receptors is in accordance with the EPP (Noise).
- o Shut down any equipment generating loud, extraneous (unusual) noise until the source of the noise can be identified and rectified.
- o Carry out construction in the hours of Monday to Saturday, during the hours of 6.30am–6.30pm. Work is not to occur outside these hours unless it is in an emergency, due to restricted times line outages can occur or other exceptional circumstances, and is approved by Powerlink. Local government, Department of Environment & Resource Management and near residents will be notified of any works outside the normal construction hours, and appropriate actions to mitigate any stakeholder concerns will be implemented.
- o Unavoidable loud noise activities will be programmed to occur at times to minimise noise nuisance in noise sensitive areas, and will not occur outside the normal construction hours.
- o Delivery or removal of materials and equipment to and from the site will occur within the approved hours for construction. All transport vehicles will be in good working order and will avoid using exhaust brakes in noise sensitive areas, adjacent to the work site.
- o Ensure transport routes to and from the site are located, where possible, so that impact of traffic noise on potentially sensitive areas can be avoided.
- o If the need for blasting is identified, carry out pre-work assessments to identify sensitive areas in proximity to blasting locations (e.g. cultural heritage sites and residences).
- o If the need for blasting is identified, design blasting, if carried out, so that the airblast overpressure and ground vibration at near noise sensitive places meets the criteria established in the *Environmental Regulation 1998*.
- o If the need for blasting is identified, ensure that any blasting to be carried out by a suitably experienced and qualified person (viz. a person with a shot firers licence issued under the *Explosives Act 1999*).
- o If the need for blasting is identified, implement measures to prevent ground vibration (such as delays), air blast overpressure and stemming ejection.

Monitoring and Auditing:

- o General auditory observations (qualitative assessments) during site activities.
- o Noise assessments (quantitative) following non-vexatious noise complaint. These noise assessment will be carried out, where necessary, to investigate a complaint. The noise assessment will determine if noise nuisance has occurred, and will also identify measures to reduce the likelihood of further complaint.

Reporting:

- o If the need for blasting is identified, provide 7 days notification of any works outside of normal construction hours or the firing of a blast.
- o The complaints register shall be used to record any incidence of noise or vibration nuisance.
- o All complaints to be reported to the PEA immediately and in writing within 24 hours.
- o Complainants will be recorded in the complaints register, including the resolution of the complaint.
- o Summary of non-compliances, corrective actions and preventative actions to be recorded in the monthly compliance report.

Corrective Action:

- o Investigate any noise complaints and implement measures, where practicable, to prevent the re-occurrence of a similar complaint. Noise measurement and monitoring may be required.
- o Repair or modify defective or noisy equipment to comply with the above policy requirements.
- o Concerns in relation to work outside normal construction hours will be addressed, and actions will be implemented in negotiation with landholders to achieve a mutually beneficial outcome.
- o The environmental issues register will outline actions to be implemented to prevent the re-occurrence of noise nuisance

5.12.5 Operation and Maintenance Phase

Implementation Strategy:

- o Ensure noise levels are below 5 dB above the background level (based on a similar type of noise (pumps) in the Environmental Protection Act - s44OT).

Monitoring and Auditing:

- o As specified for the Construction Phase and Reporting procedure outlined in Section 3.6 of this EMP

Reporting:

- o Any noise related complaints will be reviewed quarterly and reported to the Asset Manager.

Corrective Action:

- o Investigate any noise complaints and take steps to reduce impact. This may include a noise assessment if appropriate.

5.13 Traffic and Site Access

The area adjacent to the proposed substation comprises a number of State controlled roads under the management of the Department of Transport and Main Roads (DTMR) and local authority roads under the management of the recently formed *Western Downs Regional Council*. During the construction phase, a light increase of traffic volumes on the roads adjacent to the substation is expected to occur given to the necessary transport of materials, equipment and personnel. Vehicle movements related to the maintenance and inspections of the substation are expected to be very low, particularly when compared to those that will potentially occur during the construction phase. The anticipated route to be used by construction vehicles should be inspected prior to the commencement of the construction works. The access to the substation site must be cleared of any obstacles or constraints and the pavement must be in good condition to ensure that access to the site can be achieved even under periods of wet weather.

5.13.1 Policy

- o Ensure safe flow of traffic both to and from the site whilst minimising the impact of construction traffic on the amenity of the nearby community.

5.13.2 Performance Criteria

- o No movements off the approved access tracks.
- o Minimal disturbance to community and normal traffic flow.
- o No transport related incidents (inc. vehicles travelling to and from the project).
- o Nil complaints from surrounding property owners for access conditions or conduct of construction vehicles.
- o Appropriate security, signage and safety fencing.

5.13.3 Preconstruction Phase

Implementation Strategy:

- o Consult landholders and local authorities prior to access regarding construction and ongoing maintenance
- o Limit speed to 40km/h on unsealed, off road access tracks.
- o Implement Workplace Conduct for Powerlink Contractors (Obj. ref: A497976).
- o Obtain necessary approvals/permits in preparation for temporary road closures. Powerlink's contractor will undertake detailed planning for the stringing across Council controlled roads.
- o Liaise with the local Council to agree temporary access points from Council-controlled roads for construction purposes. All access is to be at appropriately signed and highly visible locations.
- o Ensure all gates are to be left as found and any gate handling protocol to be implemented.
- o Implement and meet any agreed landholder requirements for access (e.g. notifications, biosecurity management, weed management etc).

Monitoring and Auditing:

- o Not applicable to this phase

Reporting:

- o Not applicable to this phase

Corrective Action:

- o Not applicable to this phase

5.13.4 Construction Phase

Implementation Strategy:

- o Consult with landowners regarding access. Obtain landholder agreement in relation to property access requirements and location.
- o Implement project requirements for access (e.g. notifications, biosecurity management, weed management etc).
- o Handle gates, as a minimum, in accordance with the following protocol:
 - o Open gates are to be left as found.

- o Closed gates are to be returned to the closed position after vehicles pass through the gate.
- o The person who opens the gate is to close the gate to ensure that the gate is secured as found.
- o Gates found closed or locked are not to be left open and unattended, for vehicle convoys or while site personnel visit a property.
- o Gates which have locks installed must be kept locked at all times.
- o Signage on the gate must be followed.
- o Consult regulatory bodies regarding new access points from local or State controlled roads.
- o Use, wherever practicable, existing roads and farm/property/access tracks for access.
- o Restrict those off road vehicle movements to those for safe, efficient and essential construction activities.
- o Ensure temporary or permanent road signage complies with the Queensland Department of Main Roads Manual for Uniform Traffic Control Device and be approved by the relevant council and/or the Department of Main Roads.
- o Install appropriate signage, where required, at off road access tracks to assist with construction personnel keeping to these approved access tracks.
- o Minimise development of new access tracks, where possible, by using existing roads and property tracks for access. Using existing accesses will avoid/minimise unnecessary soil, vegetation and fauna disturbance.
- o Limit vehicle speed on unsealed accesses to a maximum of 40 km/h. Vehicle speed limit may be reduced on unsealed access tracks where condition of access tracks or potential for environmental nuisances is a concern.
- o Ensure loaded vehicles do not exceed design and standard vehicle weights.
- o Erect truck warning signs where warranted by limited visibility.
- o Conduct stringing lines across Banana Bridge Road in consultation with the road controlling authority. Where possible, program stringing during low traffic movement periods, such as early morning to minimise disruption to road users. Necessary approvals to be obtained by the contractor.
- o Ensure the transport hazardous or dangerous goods in accordance with the Australian Dangerous Goods Code for road and rail and *Transport Operations (Road Use Management) Regulation 1995*.
- o Restrict access to public (non-construction personnel) during construction activities.
- o Install appropriate controls/fencing/barriers in locations where fauna interaction is likely. Ensure that these controls are maintained in good working order while construction is occurring to restrict such intrusions.
- o Induct all personnel on the Traffic and Site Access requirements.
- o Implement Workplace Conduct for Powerlink Contractors (Obj. ref: A497976).
- o Confine all activities to within the approved work area, work pads and approved access tracks. Areas outside approved work areas are not to be used for storage of plant, equipment or vehicles without landholder and Powerlink's approval.
- o Ensure that the contractor prepares a traffic management plan for the project.
- o Clearly identify all project (Powerlink and contractor) vehicles so that the community can identify the vehicles without confusion.

Monitoring and Auditing:

- o Monitoring will be conducted to ensure compliance with the Performance Criteria and Implementation Strategies specified in this EMP
- o General surveillance of access tracks and surrounding areas for damage to access tracks, off access movements or impact on other road users.

Reporting:

- o Reporting shall be in accordance with Section 3.5 of this EMP
- o Complaints to be recorded in the Complaint Register. Complaints to be immediately reported to Powerlink upon receipt of a complaint (traffic and security matters).
- o Reporting of traffic issues will be conducted in accordance with the requirements of approvals/licences e.g. development approval conditions
- o Contractors records of site inductions.

- o Report and document damage to private assets, access tracks and local roads.
- o Summary of non-compliances, corrective actions and preventative actions to be recorded in the monthly compliance report.

Corrective Action:

- o Ensure above implementation strategies are in place
- o Review and amend Implementation strategies if necessary.
- o Repair damage to private assets, access tracks and local roads in consultation with the relevant stakeholder.

5.13.5 Operation and Maintenance Phase

Implementation Strategy:

- o Determine maintenance access routes and protocols in consultation with landowners
- o Where required, implement weed spread avoidance strategies e.g. wash downs
- o Use existing roads and tracks only to access the substation site and transmission line
- o Limit vehicle speed on unsealed access tracks to a maximum of 40 km/h. Vehicle speed limit may be reduced on unsealed access tracks where condition of access tracks or potential for environmental nuisances is a concern.
- o Implement Workplace Conduct for Powerlink Contractors (Obj. ref: A497976).

Monitoring and Auditing:

- o Monitoring and auditing against the Performance Criteria and Implementation Strategy sections of this EMP will be conducted.

Reporting:

- o Reporting in accordance with Section 3.5.

Corrective Action:

- o Ensure above implementation strategies are in place
- o Review and amend implementation strategies if necessary

5.14 Unexploded Ordnances (UXOs)

A search of the Department of Defence maps indicates that the site is in an area unaffected by UXOs.

5.14.1 Policy

- o Compliance with Powerlink's *AM-POL-0183 Management of Unexploded Ordnances* (Obj. ref: A58003)

5.14.2 Performance Criteria

- o Work practices recognise the potential to expose UXOs
- o Appropriate identification, handling and reporting of UXOs

5.14.3 Preconstruction Phase

Implementation Strategy:

- o Search the Department of Defence maps prior to any works to check UXO status of property has not changed.

Monitoring and Auditing:

- o Not applicable

Reporting:

- o See corrective action.

Corrective Action:

- o If UXOs or suspicious objects are discovered:
 - o Do not disturb, touch or move the object
 - o Note the general appearance, dimensions and any visible markings on the object
 - o Safely and clearly mark its location (without disturbing or impacting on the object)
 - o Cease work in the immediate area and inform others in that area of the presence of a suspicious object
 - o If possible, leave one person at the site to warn others and to prevent disturbance of the object
 - o Note the route to the object
 - o Advise the police as soon as possible and seek their action to have the object dealt with
 - o Call 1800 353 031 and report the suspected find to the Powerlink Hotline.
 - o Do not re-enter the area of the discovery until it is made safe.

5.14.4 Construction Phase

Implementation Strategy:

- o General surveillance of work areas for UXO discoveries. Should UXO's be found or Department of Defence status of property change, implement relevant UXO measures.

Monitoring and Auditing:

- o General surveillance for UXOs when working on site.

Reporting:

- o See corrective action.
- o Summary of discoveries, non-compliances, corrective actions and preventative actions to be recorded in the monthly compliance report.

Corrective Action:

- o If UXOs or suspicious objects are discovered:
 - o Do not disturb, touch or move the object
 - o Note the general appearance, dimensions and any visible markings on the object
 - o Safely and clearly mark its location (without disturbing or impacting on the object)
 - o Cease work in the immediate area and inform others in that area of the presence of a suspicious object
 - o If possible, leave one person at the site to warn others and to prevent disturbance of the object
 - o Note the route to the object
 - o Advise the police as soon as possible and seek their action to have the object dealt with

- o Call 1800 353 031 and report the suspected fine to the Powerlink Hotline.
- o Do not re-enter the area of the discovery until it is made safe.

5.14.5 Operation and Maintenance Phase

Implementation Strategy:

- o See Construction Implementation Strategy.

Monitoring and Auditing:

- o General surveillance for UXOs when working on site.

Reporting:

- o See corrective action.

Corrective Action:

- o See Construction Corrective Action.

5.15 Vegetation

Construction activities for the substation and associated transmission line and road infrastructure will require the clearing of both non-remnant and remnant vegetation which may have a direct impact on terrestrial flora. Whilst there is evidence of prior disturbance across much of the vegetation on the project site (i.e. substantial evidence of clearing in some areas), there are some areas of mapped remnant vegetation which have potential to have significant habitat values. Vegetated portions of the proposed substation site provide excellent cover and resources for local fauna and forest dependent species. Whilst no threatened flora species were recorded on site during the field survey, there is potential for several threatened flora species to occur on site (including *Philothea sporadica* and *Diuris sheaffiana* (Tricolour Diuris). Whilst it is understood that up to 70ha may be cleared for the development of the substation site, the remaining remnant and regrowth vegetation on the two lots should be managed to reduce further disruption of vegetation on site.

5.15.1 Policy

- o To minimise the impacts on vegetation from the construction and operation of the transmission line project, in compliance with *Electrical Safety Act*, *Vegetation Management Act 2000*, *Environmental Protection and Biodiversity and Conservation Act 1999*, and *Nature Conservation Act 1992*.

5.15.2 Performance Criteria

- o Disturbance to flora is minimised, consistent with the space requirements of the substation and the safe and reliable operation of the facility, and provision of access in accordance with standard Powerlink construction and maintenance requirements.
- o Significant habitat retained or connections maintained across the site where possible.
- o Vegetation clearing is consistent with requirements of:
 - o Powerlink's AM-POL-0050 *Vegetation Management for Transmission Corridors and Sites* (Obj. ref: A89739)
 - o Powerlink's AM-PR-0833 *Routine Vegetation Management* (Obj. ref: A667) Note : Operation and Maintenance phase only
 - o Powerlink's AM-STA-0834 *Powerlink Vegetation Control Standard* (Obj. ref: A62955)
 - o Powerlink's AM-PR-0855 *Assessment of Hazardous Marginal Trees* (Obj. ref: A676)

- Powerlink's *Guideline for Activities in a Watercourse or Lake for Destroying up to 0.25 Ha of Vegetation, Excavating up to 500m3, and Placing up to 500m3 of Fill* (Obj. ref: A471789)

5.15.3 Preconstruction Phase

Implementation Strategy:

- The proposed location of the substation site has taken into account the requirements of this EMP (namely reducing, where possible, the impacts of the substation development on vegetation).
- Identify opportunities to provide habitat connectivity across the Project site, in particular, maintaining north-south connectivity between vegetation remnants.
- Prepare EWP's to show the proposed extent and methods of clearing. The EWP's will be compatible with/complement the Erosion Prevention and Sediment Control Plans and/or benching or site work plans. The clearing methods should consider information presented in the Environmental Impact Statement. Clearing is to be carried out such that the impact on native fauna, downstream water quality and surrounding land use is minimised.
- No threatened species were identified during field investigations, however, if individuals listed under the *Environmental Protection, Biodiversity and Conservation Act 1999* or the *Nature Conservation Act 1992* are discovered on site, the location shall be noted on the EWP's and strategies implemented to minimise impact on such vegetation implemented.
- Limit the extent of clearing to that for the effective and efficient construction and maintenance activities, as well as the safe and secure operation of the substation and associated lines.

Monitoring and Auditing:

- Not applicable to this phase.

Reporting:

- Records of habitats to be protected or managed to minimise impacts to be kept and provided to the PEA by the TEPM.
- A Vegetation Management Plan (VMP) should be prepared for the site to address clearing and protection of vegetation on the site.
-

Corrective Action:

- Not applicable to this phase

5.15.4 Construction Phase

Implementation Strategy:

- Areas of vegetation to be retained should be protected by erecting temporary fencing to prevent access by machinery or construction crews. No stockpiling of material or equipment, or dumping of construction waste should be permitted in these areas.
- All activities in areas adjacent to any vegetation to be retained should be carried out in such a manner as to minimise damage to the vegetation.
- Areas to be cleared should be surveyed by a spotter catcher or ecologist within 24 hours prior to clearing to identify habitat trees that could be occupied by fauna. These trees should be clearly marked and retained during the clearing phase until fauna has had the opportunity to move into nearby habitat on their own accord.
- As construction activities may impact on retained vegetation, it is important to ensure that sediment fencing is in place before site preparation and other earthworks commence.
- Implement the requirements of the EWP's which detail the extent of clearing, clearing methods and other requirements.
- Limit the extent of clearing to that for the effective and efficient construction and maintenance activities, as well as the safe and secure operation of the substation and associated lines. Any clearing outside the designated area may require additional statutory approval.

- o Prohibit unauthorised clearing.
- o Minimise, where practicable, soil disturbance to that essential for construction activities, as soil on the project site is highly erosion prone.
- o Limit access to the approved access tracks (detailed in the EWPs). Note: additional access may be required during stringing or for emergency purposes and such additional access is to be approved by the landholder.
- o Identify habitat trees (e.g. trees containing nests or hollows) using a suitably trained person such as a spotter catcher, ecologist or PEA. Inspect these trees immediately prior to clearing and adopt, where practicable, measures to minimise fauna impacts.
- o Carry out clearing in identified Regional Ecosystems in accordance with the EWPs.
- o Clearing should be undertaken in the presence of a fauna spotter/catcher. Carry out clearing methods, on advice of the ecologist/spotter catcher/PEA and clearing contractor to minimise harm to fauna. For example, if the tree requiring removal is occupied by native fauna, considerations should be given to leaving the tree in place until any juveniles present in the tree are fledged or have left hollows.
- o Salvage, where practicable, timber of economic value (e.g. millable, fencing or landscaping). Any other timber waste may be mulched, retained onsite as microhabitat, or stacked for future disposal.
- o As the soils on the Project site are highly erosive, establishment of vegetation cover on disturbed areas is necessary as soon as practicable.
- o Restrict the burning of cleared vegetation unless permitted by the local fire warden. Should burning of cleared vegetation be undertaken, permits for vegetation burning must be obtained and provided to Powerlink prior to the burn.
- o A bushfire break of 50m will be installed around the perimeter fence of the site. This area should be free of flammable material including native trees and shrubs.
- o Induct all site personnel, on clearing methods and vegetation marking protocols. Work areas will also be clearly defined in the induction.
- o Prepare a rehabilitation or reinstatement plan to guide reinstatement/rehabilitation to close out construction activities.
- o Revegetation (grassing etc) shall be encouraged on non-work areas as required. Batters are to be revegetated/allowed to naturally regenerate on completion of pad development activities to achieve a minimum 70% groundcover.
- o Implement the local weed management plan (refer to the Weed Management Environmental Strategy).
- o Restrict all vehicles, plant and equipment movements to the approved access tracks.
- o Promote where possible on the completion of construction activities, natural regeneration. Suppress weed growth as the preferred method of initial site rehabilitation. Revegetation may be used where the likely success of natural regeneration is limited.
- o Rehabilitation of sites may involve the respreading of stockpiled topsoil (and grassing etc) where applicable, to establish cover.

Monitoring and Auditing:

- o Construction activities will be monitored to ensure compliance with the performance requirements as specified in the EMP or as frequently as necessary.
- o Extent of clearing marked up prior to the commencement of works.
- o Inductions register.
- o Any unauthorised works beyond the extent of clearing barriers.
- o Records of Fauna Inspections and removal/relocation.
- o Monitoring of clearing extent barriers.
- o Monitoring movements of vehicles, plant and equipment onsite.

Reporting:

- o In accordance with Section 3.5
- o Reporting will be carried out in compliance with conditions of any approval issued under the *Environmental Protection, Biodiversity and Conservation Act 1999*.
- o Clearing consultation records are to be prepared.
- o Construction close out records to be completed.

- o Summary of non-compliances, corrective actions and preventative actions to be recorded in the monthly compliance report.

Corrective Action:

- o Ensure above implementation strategies are in place
- o Review and amend implementation strategies as necessary
- o Corrective actions shall be developed in consultation with Powerlink where any unauthorised clearing has occurred.
- o Install fencing/bunting and signage to prevent re-occurrence of off access or work area movements or damage.
- o New flora discoveries, such as listed under the *Environmental Protection, Biodiversity and Conservation Act 1999* or *Nature Conservation Act 1992*, reported to the TEPM and appropriate management strategies for the flora discovery prepared.

5.15.5 Operation and Maintenance Phase

Implementation Strategy:

- o Carry all maintenance activities in accordance with:
 - o Powerlink's *AM-POL-0050 Vegetation Management for Transmission Corridors and Sites* (Obj. ref: A89739)
 - o Powerlink's *AM-PR-0833 Routine Vegetation Management* (Obj. ref: A667) Note : Operation and Maintenance phase only
 - o Powerlink's *AM-STA-0834 Powerlink Vegetation Control Standard* (Obj. ref: A62955)
 - o Powerlink's *AM-PR-0855 Assessment of Hazardous Marginal Trees* (Obj. ref: A676)
 - o Powerlink's *Guideline for Activities in a Watercourse or Lake for Destroying up to 0.25 Ha of Vegetation, Excavating up to 500m3, and Placing up to 500m3 of Fill* (Obj. ref:A471789)
- o Implement the local weed management plan (refer to the Weed Management Environmental Strategy).
- o Consider other requirements outlined in the construction phase of this environmental strategy, and implement where necessary.

Monitoring and Auditing:

- o Vegetation management activities will be monitored to ensure compliance with the performance requirements as specified in this Work Plan or as frequently as necessary

Reporting:

- o In accordance with Section 3.5

Corrective Action:

- o Vegetation management activities / practices shall be modified to comply with the above requirements.

5.16 Visual Amenity

A viewshed map indicating land visible from this position was plotted based on a GIS digital elevation model and an average woodland vegetation height of 12m (see Figure 15.1). With the screening effect of the Kogan Power Station and the existing vegetation on the surrounding lots, the proposed substation site is visible from only a very limited area of adjacent land to the southeast and west. The proposed substation is assumed to be between 10-12m in height and consists of electrical equipment and overhead wires; through which views of the adjacent woodland planting will be visible.

The existing woodland vegetation to the north and east of the proposed substation site will be retained and along with the position of the existing Kogan Power Station, the site cannot be seen from the Warego Highway. There are no local viewpoints from which the site is visible. The visual impact of the proposed substation development will be minimal on a regional scale. Local visual impact will be moderate due to clearance of existing vegetation during the site preparation and construction period when the site will be partly visible from Banana Bridge Road, Sixteen Mile Hall Road, the existing house to the west of the site on lot RP176346-1 and other local properties. The potential impacts on visual amenity can be mitigated and managed by adhering to visual amenity strategies outlined below.

Policy

- o To minimise the visual impact of the substation at sensitive locations by appropriate clearing techniques and vegetation screening / tree planting, as applicable.

5.16.2 Performance Criteria

- o Minimise reduction of visual amenity from locations indicated in Figure 15.1 of the EIS as seen from the substation site.

5.16.3 Preconstruction Phase

Implementation Strategy:

- o Where possible, plant/allow natural regeneration of new native woodland screens to the south and west of the substation site before construction commences to allow early establishment and growth to provide screening of construction period.
- o Where possible, minimise vegetation clearing on all sides of the substation site.
- o Retain existing vegetation in vegetated buffer areas around the substation site.
- o Provide the owners of the property to the west of the substation site with landscaping advice on screen planting that can be established to help screen views of the substation from their home.

Monitoring and Auditing:

- o Not applicable to this phase

Reporting:

- o Not applicable to this phase

Corrective Action:

- o Not applicable to this phase

5.16.4 Construction Phase

Implementation Strategy:

- o Implement the requirements of this EMP.
- o Maintain and manage woodland vegetation screening adjacent to substation site, in consultation with visual amenity consultant.

Monitoring and Auditing:

- o The visual amenity of the project shall be progressively monitored by the PEA.
- o Through the use of a complaints register, evaluate the impacts from the construction on the visual amenity of adjacent residents.

Reporting:

- o In accordance with Section 3.5 of the EMP
- o Summary of non-compliances, corrective actions and preventative actions to be recorded in the monthly compliance report.

Corrective Action:

- o In the event of a complaint, the PEA will investigate (refer Section 3.6 of this EMP for specific details) and recommend an appropriate mitigation response.

5.16.5 Operation and Maintenance Phase

Implementation Strategy:

- o Maintain vegetation to provide visual screening of assets where possible and appropriate.
- o If required, provide property owners with Powerlink Information Brochure '*Screening your home from Powerlines: A guide for planting trees and shrubs outside of easements to screen Powerlines*'.

Monitoring and Auditing:

- o Monitoring and auditing against the Performance Criteria and Implementation Strategy sections of this EMP will be conducted

Reporting:

- o As specified in Section 3.5

Corrective Action:

- o Investigate any complaint and recommend appropriate mitigation.

5.17 Waste

Waste products, including cleared vegetation, excess spoil, waste concrete, and domestic rubbish will be generated from the construction of the substation. In addition, waste water, gas cylinders and sewage will be generated during the operation and maintenance phases of the Project. The potential impacts of waste generation can be mitigated and managed by adopting appropriate waste disposal and tracking procedures, as well as adhering to waste management strategies outlined below.

5.17.1 Policy

- o Compliance with *Environmental Protection (Waste) Policy 1997*

5.17.2 Performance Criteria

- o No uncontrolled waste or litter observed on site
- o No evidence of uncontrolled releases to surrounding environment (e.g. dewatering or fugitive waste)
- o Appropriate storage and disposal of fuels and waste evident on site.
- o Powerlink's procedure AM-PR-0926 Management, Transport and Disposal of Waste Insulating and Petroleum-Based Liquids (Regulated Wastes) (Obj. ref: A598354)

5.17.3 Preconstruction Phase

Implementation Strategy:

- o Not applicable to this phase

Monitoring and Auditing:

- o Not applicable to this phase

Reporting:

- o Not applicable to this phase

Corrective Action:

- o Not applicable to this phase

5.17.4 Construction Phase

Implementation Strategy:

- o Prepare (the contractor) a Waste Management Plan which addresses the collection, handling and disposal of waste. The Waste Management Plan should explore the opportunities to avoid, reduce, reuse and recycle waste materials. Where practical, wastes shall be segregated and reused/recycled (e.g. scrap metal and cable off cuts). The waste management plan is to also establish a preferred waste management hierarchy and develop principles for achieving good waste management in accordance with the Environmental Protection (Waste Management) Policy 2000. This plan must identify waste removal service providers for the removal of the various wastes identified for the construction process.
- o Clearly identify collection bins as "general waste" and "recyclables"
- o Dispose of felled timber, if retained on site and not burnt, in consultation with local rural fire officers so that the residues do not pose a fire hazard. Vegetation residues should not impact on downstream water quality or the easement land use. Consideration should also be given when assessing appropriate residual material management to potential fire hazard and impact.
- o Store regulated waste (e.g. hydrocarbons) in appropriately sealed containers suitably marked identifying their contents. Transfer to a waste contractor licensed to receive such waste. Regulated waste quantities over 250kg must be tracked using the methods under the Environmental Protection Act and Regulations/Policies. Records of disposal shall be maintained and be provided to the Superintendent on request.
- o Refuse containers to be used and personal waste is to be found on the site. Personal waste, including food scraps, are to be removed from site at the end of each day and disposed of off site at a facility approved to take such waste.
- o Collect and dispose of appropriately and regularly, all construction waste. Construction waste waiting collection is to be left in a tidy manner such that it does not impact on stock or have the potential to be wind blown otherwise it will be removed.
- o Use ablution facilities/portable toilets when provided.
- o Prohibit the discard of cigarette butts to ground. The contractor is to address the management of cigarette butts in the Contractor's Waste Management Plan.
- o Dispose all personal and construction waste off site at a facility approved to accept such waste.
- o All SF6 containers are to be returned for re-use.

Reporting:

- o Reporting as specified by Section 3.5 of this EMP.
- o Landholder clearing consultation record to be completed.
- o Copies of all hazardous waste disposal certificates provided to Powerlink.
- o Inductions register.
- o Summary of non-compliances, corrective actions and preventative actions to be recorded in the monthly compliance report.

Corrective Action:

- o Clean up works in accordance with the Performance Criteria and Implementation Strategy sections of this EMP.

5.17.5 Operation and Maintenance Phase

Implementation Strategy:

- o As specified for the Construction Phase of this EMP

Monitoring and Auditing:

- o Monitoring will be conducted to ensure compliance with the Performance Criteria and Implementation Strategies specified in this EMP

Reporting:

- o Reporting as specified by Section 3.5

Corrective Action:

- o Clean up works in accordance with the Performance Criteria and Implementation Strategy sections of this EMP

5.18 Weed Management

Weeds impact on the ability for native vegetation to proliferate and need to be controlled to ensure the risk of spread is minimised. There are a number of declared weeds present on the Project site which will need to be managed to avoid being carried on and off the site. Rehabilitation works also need to be implemented to try to avoid outbreaks of both declared and other environmental weeds.

5.18.1 Policy

- o No introduction, release, movement or transportation of declared plants in accordance with the *Land Protection (Pests and Stock Route Management) Act 2002*.
- o Compliance with the *Agricultural Chemicals Distribution Control Act 1996*

5.18.2 Performance Criteria

- o No new weed outbreaks observed at substation site or along access tracks.
- o Compliance with Powerlink's *AM-PR-0039 Biosecurity Management – Pest and Pathogen Control Measures* (Obj. ref: A513014)
- o Powerlink's Procedure *AM-PR-0968 Vehicle and equipment cleandown* (Obj. ref: A256951)

5.18.3 Preconstruction Phase

Implementation Strategy:

- o Employees to attend site induction training which includes weed species identification (in particular those declared weed species known to occur on the project site i.e. Fireweed and Prickly pear).
- o Conduct an initial weed survey to identify any potential areas of concern and implement appropriate measures to prevent the spread of weeds.
- o Wash vehicles thoroughly before entering and after leaving the Project site to a clean property to prevent spread of weeds.
- o Implement Powerlink's Procedure AM-PR-0968 Vehicle and equipment cleardown (Obj. ref: A256951)
- o Control existing infestations, where practical and to assist in reducing risks, prior to the commencement of construction activities.
- o Develop a local weed management plan for declared weeds present on the site. The weed management plan will cover the following items, but not be limited to:
 - o Aim
 - o Introduction
 - o Identification / Methods section
 - o Consultation section
 - o Findings section
 - o Recommended Local Weed Management Program (including all management strategies)
 - o Any Appendages (including survey results)

Note: Management strategies may include but not be limited to:

- o Preconstruction wash downs for all equipment coming to site
- o Documentation procedure
- o Education
- o Treatment of dirty areas preconstruction
- o Specific machinery wash downs depending on risks
- o Placement and use of temporary and permanent wash down facilities (if possible wash down facilities should be located at all "dirty area" exits)
- o Monitoring
- o Continual chemical treatment
- o Response in the event of a weed outbreak
- o Work within local council pest and weed management program

Monitoring and Auditing:

- o Not applicable to this phase

Reporting:

- o Not applicable to this phase

Corrective Action:

- o Not applicable to this phase

5.18.4 Construction Phase

Implementation Strategy:

- o Implement the local weed management plan.
- o All personnel will be trained in the implementation of the Weed Management Plan during the induction.

Monitoring and Auditing:

Monitoring will be conducted to ensure compliance with the Local Weed Management Plan.

Employees/contractors working on site to report presence of declared weeds to the supervisor by the end of the working day.

- o

Reporting:

- o Distributions of declared weeds monitored and where feasible, efforts made to eradicate or contain infestations.
- o Report any suspected weed infestations to the Project Environmental Advisor.
- o Records and reporting to be carried out in accordance with the Local Weed Management Plan.
- o Summary of non-compliances, corrective actions and preventative actions to be recorded in the monthly compliance report.

Corrective Action:

- o If new weed infestations are identified, the Project Environmental Advisor will advise on appropriate treatment this may include chemical or mechanical control.
- o Add newly identified weed contaminated properties to Powerlink's PQ Maps.
- o Incorporate weed management measures for newly identified infestations in an update to the local Weed Management Plan.

5.18.5 Operation and Maintenance Phase

Implementation Strategy:

- o Train personnel on the identification of common weeds (pocket guides are available) and in particular declared weed species already identified onsite (i.e. Fireweed and Prickly pear)
- o Consult Sensitive Area Check and Property Hotspot Information (Powerlink's PQ Maps) to identify known weed contaminated properties.
- o Implement the local weed management plan.
- o All personnel will be trained in the implementation of the Weed Management Plan during the induction.
- o Implement Powerlink's Procedure AM-PR-0968 Vehicle and equipment cleandown (Obj. ref: A256951)

Monitoring and Auditing:

- o Monitoring will be conducted to ensure compliance with the Performance Criteria and Implementation Strategies specified in this EMP

Reporting:

- o Report new outbreaks to PEA in accordance with Section 3.5
- o Note locations and take photos for identification where possible

Corrective Action:

- o If new weed infestations are identified appropriate treatment and management techniques will be identified.
- o Any new infestations should be included in Sensitive Area Check/Property Hotspot information.

Appendix A – Environmental Policy



Environmental Policy

Powerlink Queensland is responsible for the operation, maintenance and development of the high voltage transmission network in Queensland.

We are committed to responsible environmental management as an integral part of our business activities. We demonstrate that commitment by:

- Consulting openly, honestly and proactively with the community and statutory authorities on the potential environmental impacts of our plans and activities. We are responsive to constructive suggestions to eliminate or minimise potentially adverse impacts.
- Recognising that environmental factors such as land use, public health and safety, noise and visual impact, protection of flora and fauna, environmentally hazardous materials management and waste management are all environmental aspects of our business.
- Maintaining a structured approach to managing our environmental aspects by implementing an Environmental Management System.
- Seeking continual improvement in the environmental performance of our operations.
- Complying with relevant environmental legislation.
- Building and encouraging ownership of environmental care among our people by providing training and support.

APPENDIX F TEAM MEMBERS

NAME	POSITION	QUALIFICATIONS
David Carberry	Senior Partner / Group Manager - Environment	Bachelor of Applied Sciences (with Honours)
Shelley Ford	Ecologist	Bachelor of Environmental Management (Sustainable Development) with Honours, University of Queensland, 2006
Dan Rattray	Senior Environmental Engineer	- Masters of Environmental Engineering, University of Southern Queensland, 2009 - Bachelor of Environmental Engineering, University of Southern Queensland, 2001 - Bachelor of Civil Technology, Central Queensland University, 1995
Sarah Stone	Environmental Scientist	- Bachelor of Applied Science Majoring in Wildlife Biology, University of Queensland – 2008 - Diploma of Applied Science Wilderness Reserves and Wildlife, University of Queensland, 2001
Brad Dreis	Senior Ecologist - Team Leader	Bachelor of Environmental Management with Honours, Griffith University 2002
Simon Pollock	Partner, Senior Planner – Conics Brisbane Pty Ltd	- Graduate Diploma Urban & Regional Planning (Specialisation – Resource and Environmental Management), QUT - Bachelor of Built Environment (Urban & Regional Planning), QUT
Will Owen	National Partner – Economics + Advisory	Bachelor of Regional and Town Planning, University of Queensland
Daniel Parker	Associate, Research Analyst – Gold Coast	Bachelor of International Business (Ecs), Griffith University - 2005
Mike O'Brien	Senior Landscape Architect	- Diploma, Landscape Architectural Technology - Diploma (Honours) Landscape Architecture
Steve Brooke	Senior Traffic Engineer/Transport Planner	- Bachelor of Technology – Engineering & Management, 1999 - Associate Diploma in Civil Engineering, 1985
Kelly D'Allesandro	Sustainability Coordinator / Senior Energy Consultant	- Bachelor of Applied Science (Environmental Science) with distinction - Bachelor of Health Science (Environmental Health) with first class honours
Adrienne Cray	Senior Partner – Community + Social Planning	- Bachelor Built Environment (Urban & Regional Planning), QUT - 1992 - Graduate Diploma - Urban & Regional Planning, QUT - 1994 - Graduate Diploma - Property Economics (Property Development major), QUT – 2006 - International Association for Public Participation (IAP2) – Certificate in Public Participation - 20