Executive Summary

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Introduction

Genex Power Limited (Genex) is seeking to establish the Kidston Renewable Energy Hub, a combination of solar and pump storage hydro power, generation facility at the old Kidston mine in northwest Queensland. Queensland Electricity Transmission Corporation Limited (trading as Powerlink Queensland) has been engaged by Genex to connect this facility to its existing transmission network at Mount Fox, via a new 275 kilovolt (kV) electricity transmission infrastructure project known as the Genex Kidston Connection Project (the Project).

Powerlink Queensland is a Transmission Entity under the *Electricity Act 1994*, and owns, operates and maintains Queensland's high voltage electricity transmission network. As a Transmission Network Service Provider in the national electricity market, Powerlink Queensland's primary role is to provide a secure and reliable network to transport high voltage electricity from generators to electricity distribution networks.

The Project is proposed as 'Infrastructure' assessable under the *Planning Act 2016* Infrastructure Designation (ID) process. In order to obtain an Infrastructure Designation, an Infrastructure Entity is required to prepare an Environmental Assessment Report (EAR) taking into account the potential environmental, social and economic impacts associated with the construction, operation and maintenance of the Project. This EAR has been prepared to support Infrastructure Designation of the Project. To demonstrate mitigation and management measures, this EAR includes Environmental Management Plans (EMP) for the relevant built components of the Project.

In early-mid 2018, Powerlink undertook public consultation on the Terms of Reference (ToR) for this EAR. The ToR is not prescribed by the Ministers Guidelines and Rules for Infrastructure Designations, but is an initiative by Powerlink to ensure a robust environmental assessment is undertaken for the Project.

Project Justification and Feasible Alternatives

In 2016/17, Powerlink prepared a Corridor Selection Report (CSR) which identified a preferred corridor for the Project. The corridor was selected on the basis that it offers the lowest potential for environmental, social and economic impact and incorporated stakeholder and landholder feedback

A preliminary alignment for the transmission line was identified within the preferred corridor. The preliminary alignment was predominantly co-located with existing Ergon Energy (Ergon) infrastructure in the region to realise a range of social, environmental and economic benefits compared to a 'greenfield' alignment.

Development alternatives were also considered in the CSR, including underground transmission lines. Underground transmission lines were not determined to be feasible based on a range of factors, including (but not limited to) cost; constructability; increased erosion potential; and no ability to span environmentally, or culturally sensitive areas.

The substation sites outlined in this document have been selected in line with Powerlink Queensland's Site Selection Guideline which required a range of factors to be considered including their location relative to the proposed generator and existing network; anticipated development size; site environmental constraints and physical features and surrounding land use. A key design objective for transmission infrastructure is the need to maintain a safe operating environment both for the public and for operational personnel, and achieving a high reliability of electricity supply at the least cost consistent with a low environmental impact.

Project Description

The Project comprises the following components:

- a 275 kV substation proposed in the locality of Mount Fox, Queensland (the 'Mount Fox substation')
- a 275 kV substation proposed in the locality of Kidston, Queensland (the 'Copperfield River substation')

- an up to 195 kilometre (km) 275 kV double circuit or single circuit transmission line between Mount Fox substation, Copperfield River substation and Genex's Kidston Solar Farm Stage Two and Kidston Pumped Storage Hydro substations (the 'transmission line').

Depending on the Copperfield River substation requirements, Powerlink may realign the transmission line west of Copperfield River to run directly north-west into the Kidston Renewable Energy Hub. Both alignments are presented in this report.

The Draft Alignment for the proposed transmission line traverses three Local Government Areas (LGA), being Hinchinbrook Shire Council (HSC), Charters Towers Regional Council (CTRC) and Etheridge Shire Council (ESC). There is one sensitive receptor within 500 meters (m) of the Draft Alignment. This has been identified as an old tin mine immediately on the northside of the Ergon 66kV line within 'Kilclooney' station, which is occasionally used as a private weekender. The Draft Alignment is located on the southern side of the 66 kV line and is approximately 100 m from the private weekender

The Project will be constructed over an 18 month period (approximately), commencing from July 2019. Works on the substations and transmission line will be undertaken concurrently. The anticipated peak construction workforce will be approximately 370 persons, occurring over a one to two month peak period. Five temporary accommodation camps for the Project workforce are proposed.

Construction of the proposed transmission line will involve a series of field activities which are broadly grouped as follows - mobilisation including establishment of accommodation camps, laydowns and offices; installation of gates, grids, cleandown bays and access tracks; vegetation clearing; tower site benching; foundation installation; structure assembly and erection; conductor and earth wire stringing; site rehabilitation and demobilisation.

Land

The topography along the Draft Alignment for the proposed transmission line ranges from flat low lying land to steep crossings of multiple ranges and mountains, including part of the Pelican Range (70 km west of Mount Fox) and the Great Dividing Range (100 km west of Mount Fox). A range of earthworks will be required for construction of the Project at a number of relatively small, discrete locations and no other changes to the geomorphic landscape are anticipated. Therefore, construction impacts on existing topography are anticipated to be negligible. No operational impacts to topography are anticipated.

The soil classification of the Draft Alignment includes vertosols; chromosols; sodosols; tenosols; and kandosols. Any activity which exposes the ground surface, such as vegetation clearing or earthworks, may potentially result in soil erosion or other soil management issues if not appropriately managed. Potential impacts may occur as a result of soil compaction. This may include a decline in soil structural stability, a decrease in water entering the soil either as rain or irrigation, and subsequent issues with poor root growth, soil cultivation and seedbed preparation. Where possible, in preference to creating new tracks, existing access tracks will be used. Erosion and sediment control measures will be implemented and reinstatement will occur as soon as practicable.

The Project area is mapped as having a "high probability" of containing acid sulfate soils (ASS) where the Draft Alignment crosses the Copperfield River and East Creek near Kidston and the Burdekin River near Greenvale. These high probability areas are mapped as between 100 m and 250 m in width where they intersect the Draft Alignment. Structures will be located a minimum of 50 m from watercourses, where possible, and it is anticipated that the majority of areas mapped as high probability ASS will be avoided during construction.

Several resource interests governed by the *Mineral Resources Act 1989* have been identified. Two Mining Leases are directly traversed by the Draft Alignment, including the old Kidston gold mine site and One Mile. Where infrastructure is proposed to cross or traverse a resource interest, consent from the respective authority holders may be required for construction of the transmission line, however this is not linked to the Infrastructure Designation process. The Project intersects with 15 Exploration Permits for Minerals (EPM). Exploration activities associated with these EPMs are not sufficiently advanced for possible mining footprints to be considered for potential impacts within this EAR.

No lots traversed by the Draft Alignment were identified on the contaminated land register (CLR) during the search. Ten lots were identified on the environmental management register (EMR) for a

'notifiable activity' (activities that have the potential to cause land contamination). For the majority of rural properties only a small area may be affected by the notifiable activity, such as chemicals used in livestock dips and spray races. Geotechnical investigations will be undertaken prior to construction which may include testing for the presence of contaminants where contamination is known or suspected.

Air Quality

In order to characterise the existing air quality values in the Project area a review of available air quality monitoring data was conducted. The nearest available air quality monitoring data is from Townsville, located approximately 100 km south-east of the Draft Alignment. As the Project area lacks large populations and special industry, Townsville should be considered to be a very conservative estimation of the existing Project area air environment.

The construction and operational phases of the Project are likely to include activities that have the potential to impact the local air quality, mainly resulting from potential dust emissions. A semi-quantitative risk assessment of potential dust impacts on surrounding sensitive receptors was undertaken for the construction phase of the Project. The assessment showed that unmitigated air emissions from the construction phase of the Project pose a low risk of dust soiling and human health impacts. Emissions associated with construction activities are expected to be localised to the immediate area and only present for a short period of time. Nonetheless, active management of dust emissions during the construction phase is recommended to ensure project goals are met.

Potential air quality impacts associated with the operation and maintenance of the Project are also anticipated to be low to negligible. The activities associated with the operational phase that have potential to create emissions are mostly related to vegetation management, use and maintenance of access tracks and exhaust emissions associated with vehicles and machinery.

Mitigation and management measures proposed for both the construction and operation phases are in line with Powerlink's Standard Environmental Controls Specification.

Hydrology

The Project involves 31 crossings of a third order (or higher) stream, with five of these in the Gilbert Basin and the remaining 26 crossings in the Burdekin River Basin. All watercourses crossed by the Project are ephemeral and generally cease to flow shortly after the cessation of rainfall. Water flows in the upper Burdekin can persist several months following the wet season, however flows generally cease in the dry season in this section of the river.

Where practicable, transmission line structures are typically placed on high points in the landscape to maximise span distances. Transmission lines typically avoid drainage lines and depressions in the landscape, minimising their impact on surface water resources.

The flood immunity of the substations was determined for the 0.5% Annual Exceedance Probability (AEP) event. As the Copperfield River substation is outside of the flood envelope for the 0.5% AEP there will be no impact on flood levels as a result of construction of the substation. Similarly, the Mount Fox substation lies outside of the flood extents determined for the probable maximum flood as part of the Burdekin Flood Investigation.

Protected Areas

The Project does not impact any protected areas. The nearest identified protected area is the Girringun National Park, approximately 350 m north of the Draft Alignment at the eastern (Mount Fox) end. All other identified protected areas are located greater than 1.5 km from the Draft Alignment. Potential impacts on protected areas are therefore anticipated to be limited to minor and indirect impacts on Girringun National Park associated with noise, dust and visual amenity. Standard mitigation measures will be implemented to minimise potential dust and noise impacts on protected areas.

Flora and Fauna

The transmission line corridor contains large tracts of remnant vegetation, with 75% containing Least Concern and Of Concern REs. Based on a maximum clearing width of 60 m, a maximum of between 1,704 ha (Option A) and 1,765 ha (Option B) of remnant vegetation may be cleared by the Project. However, following the incorporation of mitigation measures into the design process, such as scalloping or spanning over sensitive environments, the final amount of vegetation clearing will be less than this amount.

No conservation significant flora species were identified within the Project area; however *Leptospermum pallidum,* listed as Near Threatened under the *Nature Conservation Act 1992* (NC Act), was identified adjacent to the Draft Alignment (within 25 metres). A protected plants survey was undertaken on the eastern most extent of the alignment in accordance with the *Flora Survey Guidelines – Protected Plants* due to the high risk trigger area shown in Queensland Herbarium records. The survey effort did not identify any conservation significant flora species.

Four (4) conservation significant flora are considered to have a moderate or high likelihood of occurring within the Draft Alignment, based on recent/nearby records and/or the presence of suitable habitat.

Four conservation significant fauna species were identified during the field surveys:

- Squatter pigeon (southern) (*Geophaps scripta scripta*), listed as Vulnerable under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the NC Act.
- Sharman's rock-wallaby (*Petrogale sharmani*), listed as Vulnerable under the EPBC Act and the NC Act.
- Greater glider (*Petauroides volans*), listed as Vulnerable under the EPBC Act and the NC Act.
- Short-beaked echidna (*Tachyglossus aculeatus*), listed as Special Least Concern under the NC Act.

Ten conservation significant fauna and 3 migratory species are considered to have a moderate or high likelihood of occurring within the Project area, based on recent/nearby records and/or the presence of suitable habitat.

Mitigation measures to minimise potential impacts to conservation significant fauna and flora species have been proposed. Measures will be incorporated into the design process, where practical, and may include the following.

- Vegetation clearing to be minimised in sensitive environments, specifically riparian areas around creek lines and potential habitat for conservation significant flora and fauna species.
- Appropriate erosion and sediment control measures will be installed and maintained.
- A Biosecurity Management Plan will be developed and implemented which will cover the construction and operation periods of the Project.
- Pre-clearance surveys to identify shelters and breeding places potentially utilised by Least Concern species, colonial breeders and conservation significant fauna will be undertaken.
- Species-specific mitigation measures for conservation significant flora and fauna species have also been recommended to reduce and/or avoid impacts to the species.

Matters of Environmental Significance

Matters of environmental significance present within the Project area include both matters of national environmental significance (MNES) and matters of state environmental significance (MSES).

MNES identified as potentially present within the Project area include ‘nationally threatened species and ecological communities’ and ‘migratory species’ under the *Environment Protection and Biodiversity Conservation Act 1999*.

Seven listed protected species have been identified as known, or with a high or medium likelihood of being present within the Draft Alignment. This EAR has presented the worst case impact scenario associated with full clearing of the proposed 60 m wide transmission line easement. Powerlink

Queensland is currently incorporating mitigation measures into the design process to avoid and/or significantly reduce the extent of potential impacts on MNES as a result of habitat clearing and/or fragmentation. Upon completion of the mitigation though design process, Powerlink Queensland will finalise the assessment of the Project against the significant impact criteria for listed threatened species and ecological communities. The assessment will be used to support a Referral under the EPBC Act.

MSES are defined under the Environmental Offsets Regulation 2014. MSES that are applicable to the Project include 'Of Concern' regional ecosystems and essential habitat managed under the *Vegetation Management Act 1999;* habitat for endangered, vulnerable or special least concern fauna species managed under the *Nature Conservation Act 1992*; and watercourses in high ecological value waters under the *Environmental Protection Act 1994*. The Infrastructure Designation process under the *Planning Act 2016* is not considered a prescribed activity for the purposes of providing an offset under this *Environmental Offset Act 2014*.

Regardless of the above, Powerlink Queensland have employed the 'avoid, minimise, and mitigate' approach throughout the Project, including the corridor selection process; employing mitigation through design (currently being undertaken by Powerlink Queensland to reduce impacts where possible) and mitigating environmental impacts through implementation of Environmental Management Plans.

Biosecurity

The Project area is within three existing biosecurity zones: Cattle Tick Biosecurity Zone; Northern Banana Biosecurity Zone; and Sugar Cane Biosecurity Zone 1. Four restricted plants under the *Biosecurity Act 2014* were identified in the Project area (Parthenium, Lantana, Rubber Vine and Elephant Ear Vine), of which two are also WoNS (Parthenium and Rubber Vine). Nine (9) plants are listed as a priority weed within at least one local government biosecurity plan. Although not recorded during biodiversity surveys in the Project area, the Department of State Development, Manufacturing, Industry and Planning (DSDMIP) advised that Siam weed (*Chromolaene odorata*) has recently been seen in the region.

The field surveys recorded seven introduced fauna species, five of which are restricted under the *Biosecurity Act 2014*. Three further introduced fauna species identified as likely to occur within the Project area are European fox (*Vulpes vulpes*) (priority pest animal: HSC, CTRC), black rat (*Rattus rattus*), and house mouse (*Mus musculus*).

The EAR has identified a number of potential impacts including the introduction of weed species, edge effects and habitat degradation through exacerbation or introduction of pests and weed. A detailed pre-construction weed survey will be undertaken prior to construction activities commencing and a post-construction weed survey will be undertaken after the first wet season once construction is finalised. A Biosecurity Management Plan will be developed to support construction and operation of the Project and to achieve Powerlink Queensland's general biosecurity obligation under the *Biosecurity Act 2014*.

Land Use

The Draft Alignment currently traverses 21 land parcels. Land tenure arrangements are mainly leasehold land, with the exception of four parcels being freehold land. The Draft Alignment traverses three LGAs, with individualised Local Planning Instruments. Land use intent for rural areas area similar across the three LGAs and includes the maintenance of rural character and amenity.

The existing rural character of the area traversed by the Draft Alignment for the proposed transmission line is generally typified by rural properties, with large lot sizes, one or two dwellings with supporting agricultural operational buildings, sheds or structures. Existing built infrastructure includes a number of gravel roads and existing Ergon powerlines including Single Wire Earth Return (SWER), 66 kV and 132 kV. The rural character is also supported by dense vegetated areas, and natural features such as waterways, valleys and ridgelines. Co-location of the proposed transmission line with existing electrical infrastructure for large sections of the alignment minimises impacts on the character and amenity of the rural area.

The dominant land use within the Project area is agricultural land, characterised by pastoral or grazing properties for livestock production (predominantly beef cattle), including some areas of Class A and

Class B agricultural land. The Draft Alignment traverses five 'open' stock routes, all classified as minor and unused.

In most instances where the Draft Alignment traverses Class A or B agricultural land and stock routes, the proposed transmission line has been co-located with existing Ergon Energy 66 kV and 132 kV lines. Between Greenvale and Conjuboy, the Draft Alignment is not co-located with any Ergon lines and Powerlink Queensland has worked closely with affected landholders to determine an alignment which manages property impacts.

Visual Amenity

The visual impact assessment identified one potential impact at Mount Fox, namely Girringun National Park. The high sensitivity of the viewpoint was allocated due to the high sensitivity of viewers (e.g. tourists, visitors and nearby residents) and its classification as National Park. The assessment concluded that the structures will form a visible but not defining element of the view. Whilst the structures will be evident, it was determined that they will not change the fundamental visual character of the landscape and will 'blend' with the existing view to a considerable extent, introducing another simple and repetitive element into this large-scale landscape.

During the corridor selection process, the visual impacts on the surrounding visual receptors were considered. The preliminary alignment in the Corridor Selection Report was positioned as far as practicable away from visual receptors and took advantage of screening by existing vegetation and topography where possible. Due to the size of typical structures, which, at around 50 m, are taller than mature trees, it is not possible to fully 'screen' or 'hide' the transmission structures or associated infrastructure within the landscape.

Social and Economic

The Project is unlikely to have significant adverse impacts on the socio–economic profile of the area during the construction or maintenance/operational phases. During construction there will be a temporary influx of workers into the region. The workforce required will be small and will not significantly influence the existing community profile. The operational phase of the Project is not anticipated to have any material impact upon the demographic profile of local and regional populations.

The development of this electricity transmission infrastructure will assist and support the region to develop and prosper through the benefits associated with the Kidston Renewable Energy Hub. Powerlink Queensland will continue working closely with affected landholders to ensure they are informed of upcoming project activities and property specific access requirements are incorporated into the construction phase.

Indigenous Cultural Heritage

No known places of Indigenous cultural heritage significance were identified from desktop searches within the Draft Alignment. A search of the DATSIP database identifies three Aboriginal Parties whose Native Title determinations/claims are intersected by the Draft Alignment, including Gugu Badhum People #3, Ewamian People #2, and Ewamian People #3. Powerlink Queensland has established processes for, and significant experience in, working closely with Traditional Owners for the management of cultural heritage risks in transmission line and substation development. Powerlink Queensland is actively engaging with each of the Native Title groups to develop cultural heritage management agreements (CHMA), which will include agreed methodology for the identification and management of Aboriginal cultural heritage sites and values within, and in the vicinity of, the Draft Alignment. This will include detailed cultural heritage surveys of the Draft Alignment with the Traditional Owners.

Non-Indigenous Cultural Heritage

There are no registered historical heritage places within or directly adjacent to the Project area, and so no impacts are anticipated to known non-indigenous cultural heritage values. There is some potential for the Project to impact unidentified historical heritage places. Any such unidentified places are most likely to relate to the pastoral or mining history of the region. This includes five abandoned mines that are thought to be within 500 m of the Project, as well as other, potentially undocumented mine workings or early pastoral complexes.

Archaeological potential is thought to be highest around the former mine workings and present-day camp site on 'Kilclooney', and on the Copperfield leases south of Kidston. Powerlink Queensland have sought to minimise impact on the Kilclooney site by locating the Draft Alignment on the southern side of Ergon 66kV line. However, the potential for heritage impact on the Copperfield leases and the requirement for any mitigation has yet to be established. It is recommended that a site inspection be undertaken in this area to identify any mining heritage places, and to recommend management measures if required.

Residual risk across the remainder of the Project will be mitigated by the following general construction phase environmental management measures, including cultural heritage inductions and unexpected find procedures.

Transport and Traffic

The road network in the vicinity of the Draft Alignment includes both State-controlled roads and local authority roads. It is anticipated that the majority of the traffic travelling to the Project area will originate from Brisbane and Townsville. The generated traffic includes the transportation of machinery, materials, equipment and personnel during both the construction and operation phases. Access to the various work sites for construction materials, plant and personnel will use existing property access tracks where possible. Any new access tracks will be identified in consultation with landholders.

The Draft Alignment for the proposed transmission line intersects both the Kennedy Developmental Road and the Gregory Developmental Road, being State-controlled roads. The estimated construction traffic volumes will have minimal impact on the proposed route during the construction period except Gregory Developmental Road. The estimated construction traffic exceeds 5% of the background traffic on Gregory Developmental Road (Charters Towers to Project area). Detailed traffic/pavement impact assessment will be necessary to assess the level of impact on this section of roads, in terms of safety, access, intersection delay, road link capacity, pavement, bridges and culverts. A detailed Traffic Management Plan for the Project will also be developed and implemented prior to construction works.

The Draft Alignment traverses several locally administered major and minor roads, comprised mainly of unsealed roads and roads that have been gazetted, however remain unformed or undeveloped. Based on the assessment, the estimated construction traffic volumes exceed 5% of the background traffic on Craiglee Road and Greenvale Road during construction. However, the traffic operation of these roads is unlikely to be impacted by the Project, given the low background traffic volumes and the temporary duration of the construction works. Powerlink will work with each Council to agree on road use protocols including maintenance and remediation works if damage is caused by project traffic.

No certified aerodromes or regulated air service routes (of regional or State significance) are in close proximity to the Draft Alignment. The Draft Alignment for the proposed transmission line is sufficiently removed from the Greenvale and Kidston aerodromes and no impacts are anticipated on this infrastructure. Ten airstrips were identified within 8 km of the Draft Alignment.

Noise and Vibration

Noise-generating equipment was identified across fifteen construction activities to determine the potential associated noise levels. Predicted setback distances at which construction noise associated with the Project is expected to comply with relevant limits identified in the *Environmental Protection Act 1994* was calculated, as well as the number of residential receptor locations at which exceedance of the noise limit is predicted to occur.

The construction activities are predicted to generally exceed the noise limits at a single sensitive receptor (a tin mine camp, used for private camping) across all scenarios for both alignment A and B. It is noted that this one receptor is only occasionally used as accommodation.

The heli-stringing construction scenario potentially impacts 20 receptors for Draft Alignment A which are located within the setback distance of 2.4 km, and 13 receptors for Draft Alignment B. This difference is attributed to the close proximity of Draft Alignment A towards the receptors in Kidston township. Whilst there are a significant number of exceedances associated with heli-stringing, this is over the entire extent of the Project. The duration of the predicted exceedance at any one receptor will be limited.

The only significant vibration-intensive works expected to take place during the proposed works would be pile boring and the use of vibratory rollers. There are no vibration-sensitive receptors within the structural damage safe working distances for pile boring rigs and vibratory rollers. However there is a single receptor (the tin mine camp) which is located within the maximum human response safe working distance for vibratory rollers with a rating of greater than 100 kN.

Noise associated with the proposed transmission line itself is primarily due to corona discharge. Noise compliant setback distances have been calculated for operational (substation shunt reactor; corona discharge) and maintenance (helicopter; mulcher) equipment. There is also a single exceedance of the night-time noise limit for Alignment A and B associated with corona discharge. This single exceedance is associated with the tin mine camp which lies 10 m within the calculated night-time setback distance. At the distance considered, this approximately equates to a <1 dB(A) exceedance. A difference of up to 2 dB(A) is generally considered to be imperceptible. The conservative approach used in the calculation of corona discharge noise means that actual noise levels will typically be lower than what has been calculated.

The operational and maintenance activities are predicted to comply with the established noise limits at nearby sensitive receptors across all operational scenarios with the exception of maintenance activities involving the inspection of the transmission line and infrastructure associated with the Project using a helicopter and operation of a mulcher during vegetation clearing maintenance activities. The operation of a mulcher is predicted to result in exceedances at one receptor for both alignments. This exceedance means that maintenance activity requiring a mulcher only exceeds the relevant criterion at a single particular receptor along the Draft Alignment (and for a limited duration), hence the overall impact is limited.

Management measures will be implemented in line with Powerlink Queensland's Standard Environmental Controls, and best practice construction environmental management plan requirements for noise management.

Hazards, Health and Safety

The Project will comply with the *Electrical Safety Act 2002, Work Health and Safety Act 2011* (WHS Act) and Work Health and Safety Regulation 2011 (WHS Reg). Risk identification has been done for the Project, and documents only significant or high risk interactions between the Project for the aspects of health, safety and environment during construction, operation and decommissioning.

The pre-mitigated risks are assessed at this stage and during detailed design. The construction risk assessment will be undertaken to identify critical controls to mitigate risks and maintain residual risk to acceptable levels. This preliminary risk assessment forms part of the larger risk management process which will continue throughout the lifecycle of the Project and has sought to identify hazards which may presently exist prior to construction. The Project will continuously monitor identified risks and conduct future risk assessments to identify and assess emergent risks throughout the Project lifecycle.

Proposed controls will be considered during detailed design and through the construction risk assessment process. The controls will be based on existing Powerlink safety management systems. The management strategies practiced by Powerlink will be in place for the duration of the Project and are not limited to the control measures discussed in this Draft EAR.

Electric Magnetic Fields

Powerlink Queensland has undertaken an electric and magnetic field (EMF) assessment for the proposed transmission line where it is co-located with Ergon Ross-Kidston 132 kV line. The modelling identified that electric and magnetic fields will be significantly below internationally recognised EMF guidelines for established health effects. Where the proposed transmission line is co-located with Ergons Greenvale 66 kV line, EMF levels are lower due to the reduced voltage and line loading.

There is one sensitive receptor within 500 m of the Draft Alignment. This has been identified as an old tin mine immediately on the north side of the Ergon 66kV line within 'Kilclooney' station, which is occasionally used as a private weekender. The Draft Alignment is located on the southern side of the 66 kV line and is approximately 100 m from the camp site. Cumulative electric and magnetic fields (EMF) associated with the Project and the Ergon line have been calculated, and it was determined that, at this distance, there will be no measurable increase in EMF over typical background levels.

Powerlink Queensland has adopted a policy of prudent avoidance with regards to EMF, and the following mitigation measures are proposed to reflect this.

- Should radio or television interference be identified, Powerlink Queensland can assist people experiencing reception problems caused by transmission line by providing advice and, if required, signal amplification equipment.
- Powerlink Queensland will assess the potential for induced charge in proximal metal objects, and propose mitigation measures for any objects in or near the easement that may be affected.
- Where the possibility that a transmission line could cause interference with the operation of an electric fence running parallel to the line, Powerlink Queensland will provide mitigation measures to assist the owner of any electric fence installation that might be adversely affected.
- In the event that corona–induced interference becomes a problem, Powerlink Queensland will arrange to undertake any necessary remedial work.

Bushfire Risk

The Draft Alignment is located in a Medium Bushfire Intensity Bushfire Prone Area. The Regional Ecosystems across the Project area were all identified as Bushfire Prone vegetation classes (Class 1, Class 2, Class 7 and Class 8), with the potential to support a significant bushfire or the potential to be subject to significant bushfire attack.

The assessment of potential impacts indicates that fire risk may potentially increase as a result of the Project, particularly during the construction stage. External environmental conditions within surrounding areas, such as the proximity and density of surrounding vegetation, climatic conditions and land use activities, may also contribute to an increased fire risk.

A rang of mitigation and management measures have been proposed throughout the design, construction, operation and maintenance of the Project.

Waste Management

Anticipated waste streams were identified for the construction, operation and maintenance phases of the Project. Construction activities are expected to produce green waste, general waste, regulated waste, and wastewater. Construction waste will be avoided, minimised and managed in accordance with the waste hierarchy, and Powerlink's Standard Environmental Controls. In addition to these controls a range of additional measures have been included. A detailed Waste Management Plan is to be developed prior to construction, including all actions needed to effectively implement the waste management hierarchy.

The types of waste generated by substation and transmission line operation and maintenance are similar to those generated as construction wastes, although in much smaller quantities. A detailed Waste Management Plan is to be developed prior to operation and maintenance, including all actions needed to effectively implement the waste management hierarchy and a waste monitoring program.

Infrastructure

Existing infrastructure within the Project area includes a number of local and state roads, airstrips, electrical infrastructure, water and sewer infrastructure, and private agricultural or renewable energy infrastructure.

During construction, the road network may be impacted through an increase in traffic associated with light vehicle movements, equipment haulage, and machinery movements. The Project may also require additional access points from the existing road network. Minimal access is anticipated during the operational phase and will be limited to maintenance requirements.

The structure foundations of the transmission line will be located to ensure that there are no physical impacts to the Copperfield Dam pipeline, and no interruption to the water supply.

No impacts will occur to Ergon infrastructure from construction and operation of the Project. The proposed transmission line is co-located with Ergon's lines, and will be separated by a minimum 40m to allow for safe and efficient construction and operation of the electrical infrastructure.

No relocation of existing infrastructure is required to facilitate the Project.

Cumulative Impacts

A number of existing and proposed developments have been identified within the wider area of the Draft Alignment. Existing developments include the 66 kv and 132 kv Ergons lines. Proposed developments include the Kidston Renewable Energy Hub (partially existing), the Greenvale Training Area, One Mile Mining Lease and the water supply projects.

Overlap in construction periods may occur with both the Kidston Renewable Energy Hub and the Greenvale Training Area. Cumulative impacts may include increases in air quality and noise emissions when the transmission line is being constructed in the same vicinity as these projects, and increased usage of State and local road networks.

Given the large distance of the Project from other existing and proposed projects in the region, cumulative impacts are anticipated to be limited to the road network during construction. Nonetheless, standard environmental controls in line with Powerlinks Standard Environmental Controls Specification will be applied to the Project to minimise potential impacts.

The operation of the Project will be limited to maintenance activities along the easement and at the substations. Therefore, any potential impacts, such as dust, noise, and traffic, will be minimal and short term and therefore cumulative impacts will be negligible.

Cumulative EMF associated with the co-location with Ergon 66 kV and 132 kV transmission lines was determined to be significantly below internationally recognised EMF guidelines for established health effects.

Environmental Management

Powerlink Queensland is committed to the protection of the environment and management of adverse environmental impacts as a result of Powerlink Queensland activities. Every Powerlink Queensland individual is responsible and accountable for environmental management, and Powerlink Queensland's leaders are active role models of this commitment.

The mitigation and management measures for this Project have been proposed in line with Powerlink's Standard Environmental Controls Specification. Additional measures have been proposed where required to provide further mitigation and management measures specifically for the Project.

Separate EMPs have been prepared to provide a framework for the implementation of project specific impact mitigation measures for the transmission line and substation components of the Project.

Planning and Approval Requirements

A number of Commonwealth, State and local pieces of legislation and policy applies to the development of the Project. Powerlink are currently undertaking assessment against the EPBC Act Significant Impact Guidelines to determine the level of impact associated with the Project. This will be subject to a future EPBC Referral.

As the Project is being assessed under the Infrastructure Designation process sunder the *Planning Act 2016*, a range of typical approvals under this Act will no longer apply to this Project, as ID makes the development 'accepted development'. Approvals outside of the *Planning Act 2016* have been identified and will be obtained by Powerlink in the subsequent stages of the Project.

Community and Stakeholder Consultation

Powerlink Queensland is committed to effective and genuine stakeholder and landholder engagement practices. Powerlink Queensland's activities are guided by a Stakeholder Engagement Framework which is underpinned by the key principles of integrity, openness, responsiveness, accountability and inclusiveness.

Powerlink Queensland has undertaken early and targeted consultation with Federal, State and Local Governments, elected representatives, industry groups and landholders as part of the Project. Engagement activity has been undertaken to help gain meaningful input into social, environmental and technical matters to be considered during the initial project development phase and subsequent construction phase. A number of engagement activities have been undertaken since March 2016. Key milestone engagement activities have been associated with Draft Corridor Selection Report, Final Corridor Selection Report and Terms of Reference.

Powerlink Queensland is continuing its direct engagement activities with stakeholders and landholders as part of the public consultation process for this Draft EAR. Ongoing engagement with stakeholders and landholders remains a key focus during the all phases of Powerlink Queensland projects. This delivers Powerlink Queensland the opportunity to strengthen and leverage relationships with stakeholders and landholders well into the future for the entire transmission infrastructure lifecycle.

Conclusion

This Draft EAR has identified that the Project has the potential to impact a range of environmental, social and economic values in the Project area and surrounds, both positively and negatively. However, through the implementation of design mitigation and standard and project–specific mitigation and management measures, these potential impacts can be minimised and mitigated.