



2.0 PROJECT JUSTIFICATION AND FEASIBLE ALTERNATIVES

2.1 PROJECT JUSTIFICATION

Electricity use in South-East and 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 (between Millmerran and Goondiwindi), 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. With projected electricity demand growth, 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 by augmenting substation plant until 2012/13 after which a major transmission line augmentation is required between these 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, and construction of a 275kV double circuit transmission line to connect this substation to the existing network by developing Halys Substation near Tarong.

2.2 FEASIBLE ALTERNATIVES

2.2.1 "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.

2.2.2 The Western Downs Substation

Powerlink is currently acquiring the Western Downs Substation (WDS) site off Banana Bridge Road, opposite the Kogan Creek Power Station. When initially constructed, this substation will connect to the powerstation, the Braemar Substation, and through to the Halys Substation. The connections to the first two facilities will be achieved by redirecting the current transmission lines which link these sites into the WDS. The connection to the Halys Substation will require the construction of approximately 130km of 275kV transmission line. A major portion of this line is to be constructed on existing easements acquired in the late 1990s for the QNI. This report addresses the section between the WDS and QNI, and involves the acquisition of easements for the construction of approximately 25km of new line.

2.3 TRANSMISSION LINE CONNECTION

The existing transmission line between Tarong substation and Braemar substations is a part of the QNI. The QNI provides one link between Queensland and the National Grid in the other States along the eastern seaboard, Tasmania and South Australia. Between Tarong and Braemar, the existing transmission line easement has sufficient width to accommodate one additional line on the western/northern side of the existing line. For the transmission connection between WDS and the Halys area (20km west of Tarong), it is proposed to maximise the use of this vacant easement, and acquire a new easement to accommodate the connection between the WDS and this existing easement. Initial investigations indicated that this easement would be approximately 25km long and intersect the QNI in the Warra/Condamine River area.

These investigations also indicated that a line departing the QNI easement in the Warra area to the north of the Condamine River would encounter significant dryland and irrigated cultivation in the Warra, Cooranga Creek and Condamine River areas. Consequently consideration was only given to route corridors which depart from the existing QNI easement south of the Condamine River.

In consideration of the location of residences, terrain, vegetation, coal resources, irrigation, line length and other rural land use restrictions, three alternative corridors were identified and evaluated between the QNI easement and the notional location for the WDS in the vicinity of the Kogan Creek Power Station. A comprehensive Corridor Selection and Preliminary Alignment Report was prepared to compare these options. The report has been included as **Appendix C**. This report concluded that, on balance and in consideration of the assessment factors, the central of the three corridors is preferred. This study alignment is shown on the figures throughout the report.

This report also identified a preliminary alignment within this corridor. This alignment was the starting point for consultation with landowners within the study corridor.