2.5 Substation Site Selection

A Substation Site Selection Report was prepared recommending two substation sites at Moorvale South and Peak Downs North.

A number of sites were assessed for both the Moorvale South and Peak Downs North substation locations. The main purposes of the Substation Site Selection Report was to select one site at each location that best addresses:

- the technical requirements of the Northern Bowen Basin Transmission Network Reinforcement Project;
- the principles and process in Schedule 5 (Powerlink manual) of the Guidelines about Environmental Assessment and Public Consultation Procedures for Designating Land for Community Infrastructure (Department of Local Government, Planning, Sport and Recreation, December 2006); and
- Powerlink’s Substation Site Selection Policy (AM-POL-0891).

Following approval of the substation locations, these sites became the focus of further investigations during the EIA process.

2.5.1 Approach and Assessment Criteria

Powerlink’s substation selection policy is outlined in AM-POL-0891 Substation Site Selection Policy (May 2009) with further information in AM-CL-0892 Checklist for Substation Site Selection (May 2009). These documents are presented in Appendix C.

The Site Selection Report was prepared in consideration of these Powerlink policies and Schedule 5 of the Department of Local Government, Planning, Sport and Recreation Guidelines about Environmental Assessment and Public Consultation Procedures for Designating Land for Community Infrastructure (Version 1.1, December 2006).

During this site selection assessment, the following key issues were taken into consideration:

- General location;
- Development;
- Physical;
- Surrounding land usage;
- Accessibility;
- Cost;
- Customer requirements;
- Environmental considerations; and
- Community considerations.

Information for the Substation Site Selection Report was collated from available existing data sources and supplemented with a reconnaissance level field inspection of the proposed sites by road and helicopter overfly.
Datasets that were mapped and related in a Geographic Information System include the digital cadastral databases of the Isaac Regional Council, 1:100,000 topographical maps, satellite imagery, DERM soil and geology databases, major road overlays, Geoscience Australia GEODATA TOPO 250K and the latest DERM Regional Ecosystem mapping (Version 6.0). Additional information was derived from the Queensland Herbarium records (HERBRECS), Queensland Museum fauna records and DERM Wildlife Online Database. Specific information on mining tenures and pipeline licences was obtained from the Department of Employment, Economic Development and Innovation (Queensland Mines and Energy) Interactive Resource and Tenure Maps.

Following the external data review, and subsequent familiarisation and field inspections of the Study Area, GHD refined the above criteria to include the following specific issues that were considered relevant.

- Limit proximity to natural drainage lines and areas of inundation (i.e. substation site must be above the 200 year average return interval (ARI) flood event);
- Nominal land size of 500 m × 500 m for Moorvale South Substation and 400 m × 250 m for Peak Downs North Substation;
- Avoidance of active Mining Lease areas;
- Minimising general proximity to Mineral Development Licence (MDL) areas (but accepting that complete avoidance of MDL areas may not be possible for the most suitable substation sites);
- Avoid or minimise the extent of Commonwealth listed threatened ecological communities adjacent or within the substation sites; and
- General access to the substations for construction, operation and maintenance.

2.5.2 General Location

The locational requirements for substations are site specific, and are determined by practicalities of engineering constraints, connection costs, environmental issues and impacts on social attributes. Generally, the location in which a substation is to be sited is dictated by load location and transmission line arrangements for connection of the substation to the grid, and the substation to the place where the connection is required. Access to the substation sites must be capable under all but the most extreme conditions. In response to State Planning Policy Guideline 1/03, Powerlink substations shall be able to function effectively through a 1 in 200 year flood event. Site selection, substation design and layout shall be such that the substation continues to function through this flood event. The site must not be within the Q200 flood inundation area, and be proximal to secure road access or be in a position where an all weather access road can be constructed. Existing land uses must not hinder access, nor limit the potential configuration of lines entering and leaving the substation (most applicable to the Moorvale South Substation). The substation site and access should also minimise the impact upon the continuation of the existing surrounding land uses. Coal mining, in particular, is very active in the area and the establishment of a substation within ML tenements has the following specific impacts:

- The holder of the mining lease is entitled to compensation for coal that is sterilised by the substation;
- Requirement to comply with mine OH&S and other operational restrictions if the mining lease needs to be crossed to access the substation; and
Consent is required from the holder of a mining lease before entering onto the connecting transmission line easements or erecting any structure on the easement land. These issues can have a significant impact on the timing and cost of the project.

Environmental issues, in the main, are factors to be considered when the above issues have been addressed. A policy of prudent avoidance of environmental/conservation matters is adopted when there are alternate options that also meet the other social and economic considerations in locating the substations.

2.5.3 Moorvale South Substation

An initial preferred Moorvale South site was recommended in the Substation Site Selection Report (SSSR) based on a combination of desktop assessment and reconnaissance investigation in November 2009 during a prolonged dry period.

Following consultation with potentially affected landholders and extensive field investigation (that included Powerlink line and substation design staff) following an extensive wet season in early 2010, an alternate property to that originally identified in the SSSR has been identified as the preferred substation site for the Moorvale South Substation.

The preferred site is on Lot 6 RP845780 just north-west of the original site (see location in Figure 4). This new site has been identified as the preferred locality on the basis:

- It has less potential impacts on current and proposed future land use than the original site.
- The site is better drained and poses less construction issues in managing surface runoff.

Powerlink’s substation design staff have confirmed that the site is suitable for construction purposes.

2.5.4 Peak Downs North Substation

The proposed site for the Peak Downs North 132/66kV Substation is approximately 700m from the existing Powerlink Moranbah – Dysart 132kV line. The substation site comprises an area of 400 m × 250 m, and an 80m wide easement is proposed for the transmission line connection between the substation and the existing Moranbah – Dysart 132kV line. The 80 m wide easement is centred on the existing 132kV tower STR 2584. The substation site is within the Winchester Downs property Lot 6 SP174999, and partially straddles two mining tenements – MDL 277 (Exxaro Australia Pty Ltd) and ML 70389 (Bowen Central Coal Pty Ltd - Eagle Downs Mine).

Both companies have been consulted and have provided preliminary input into the substation site selection process. The identified site is outside of the mining plan areas for both tenements and has been inspected by Powerlink substation design staff who have confirmed that the site is suitable for construction purposes. The substation location is shown in Figure 5.
Figure 5: Peak Downs North Substation Site

Final Alignment 132kV Connection to Eagles trustworthy line

Winchester Downs
Lot 6 SP174999

MDL 277

132kV Connection to Eagles - Moranbah line

Winchester Downs
Lot 6 SP174999

Eagle Downs Mine
ML 70399

PEAK DOWNS NORTH SUBSTATION

Winchester Downs access road

J & B Curry

J & E Leitch
2.6 Preliminary Substation Site Locations and Preliminary Alignment Amendments post Draft EIS

Following the release of the original Corridor Selection and Preliminary Alignment Reports, and the draft EIS, ongoing negotiations with landholders and mining companies resulted in the minor realignment of parts of the preliminary Final Alignment as depicted in the draft EIS released for public comment. The Final Alignment as shown in this final EIS is the result the ongoing negotiations and represents the final Final Alignment for the purposes of this report. Information in this EIS has been updated from the original draft EIS to reflect the changes in the Final Alignment.

A summary of the changes from the above documents is presented below.

Since early 2010, and following the release of the draft EIS early in 2011, extensive ongoing consultation and communication has been undertaken with potentially affected landholders (including mining tenement holders) by Powerlink's Community Contact Officers and Project Manager. This has been supplemented by several helicopter and walkthrough surveys in association with GHD, the project's environmental consultant responsible for preparing the EIS.

Through a combination of input from landholders and mining tenement holders, and ecological investigations, a number of factors have arisen that have resulted in sections of the Preliminary Alignment now being outside the approved Study Corridor, and the preferred substation site at Moorvale South being revised.

These factors are summarised below:

Northern Area
- Landowners affected by the existing Nebo-QR Mindi 132kV transmission line would prefer the new 275kV line to be co-located with the existing line.

Central Area
- Landowners in this area requested the 275kV line be located to the rear (south) of their property.
- During further discussions with the mining tenement holder of MDL 8 (Harrybrandt), it was identified that an overburden disposal area utilising two circular conveyors, and two rail loops, would be located outside of the MDL and significantly obstruct the originally approved Preliminary Alignment combined with the long term issues associated with accessing mine sites to construct and maintain the line could be avoided.

Southern Area
- The preferred Moorvale South Substation site on Lot 5 RP866478 (on the eastern side of Daunia Road) was identified during field surveys as having low lying areas of clay soils prone to water logging and swamp development during the wet season.
- Extremely severe sodic soil conditions with high erosion were noted along North Creek in the area of the Preliminary Alignment that would pose construction and access problems on Lot 3 RP866478. In addition, the landowner (Lloyd) advised of the location of a helicopter mustering race, holding area and stockyards between Annandale Road and North Creek.
- In the area just west of the Isaac River on Neilson's property, extensive melon holes (“gilgai”) were identified following the 2010 Jan – March wet season.
Discussions with Carborough Mine were prolonged and resulted in several variations in the preliminary alignment during the course of negotiations following the draft EIS release. The primary reason for the changes was the proposed configuration of the underground longwall mining proposed for the area, and the need to amend the underground mine area to avoid land subsidence potential impacts on the transmission infrastructure.

This EIS has considered the reasons for undertaking these amendments, and found that significant landowner benefits and Powerlink construction benefits are achievable without further compromise of environmental values.