Introduction Chapter 1

1.1 Background

Peak electricity demand in New South Wales (NSW) is growing at a faster rate than average demand. This diverging trend between average or base load and peak load demand profiles can generally be attributed to the sustained period of strong economic growth and prosperity that has been occurring in Australia over the past 10 to 15 years.

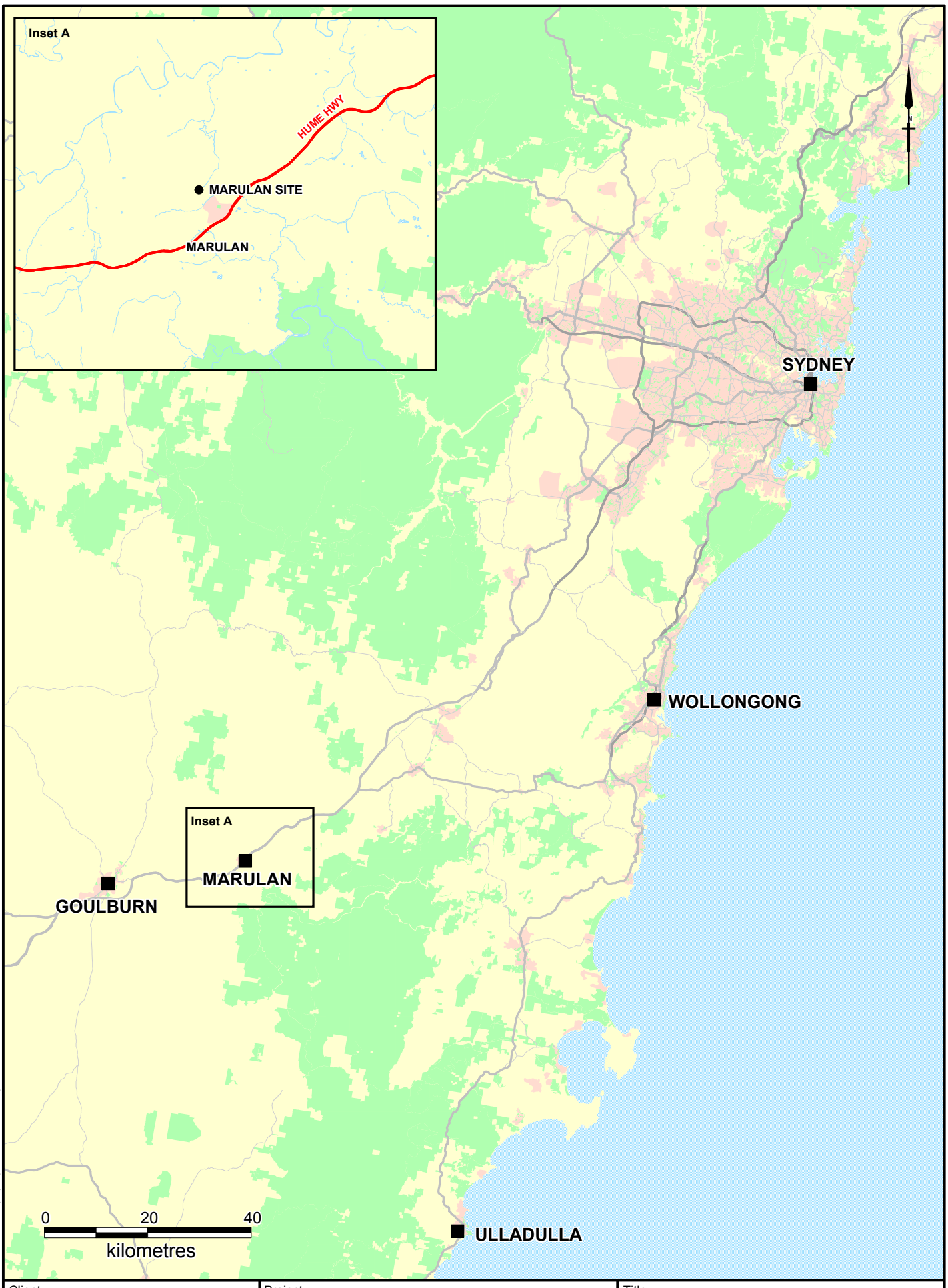
The 2006 and 2007 *NEMMCO Statement of Opportunities* predicts that over the next decade rising electricity demand will exceed existing generation capacity. To meet the immediate growth in demand for electricity, a number of additional power plants would be required to provide a peaking capacity in the order of 300 MW per annum for five years from 2009. Peak power demand is growing faster than base load demand, which necessitates investment in peaking power generation before base load power generation.

1.2 Project Outline

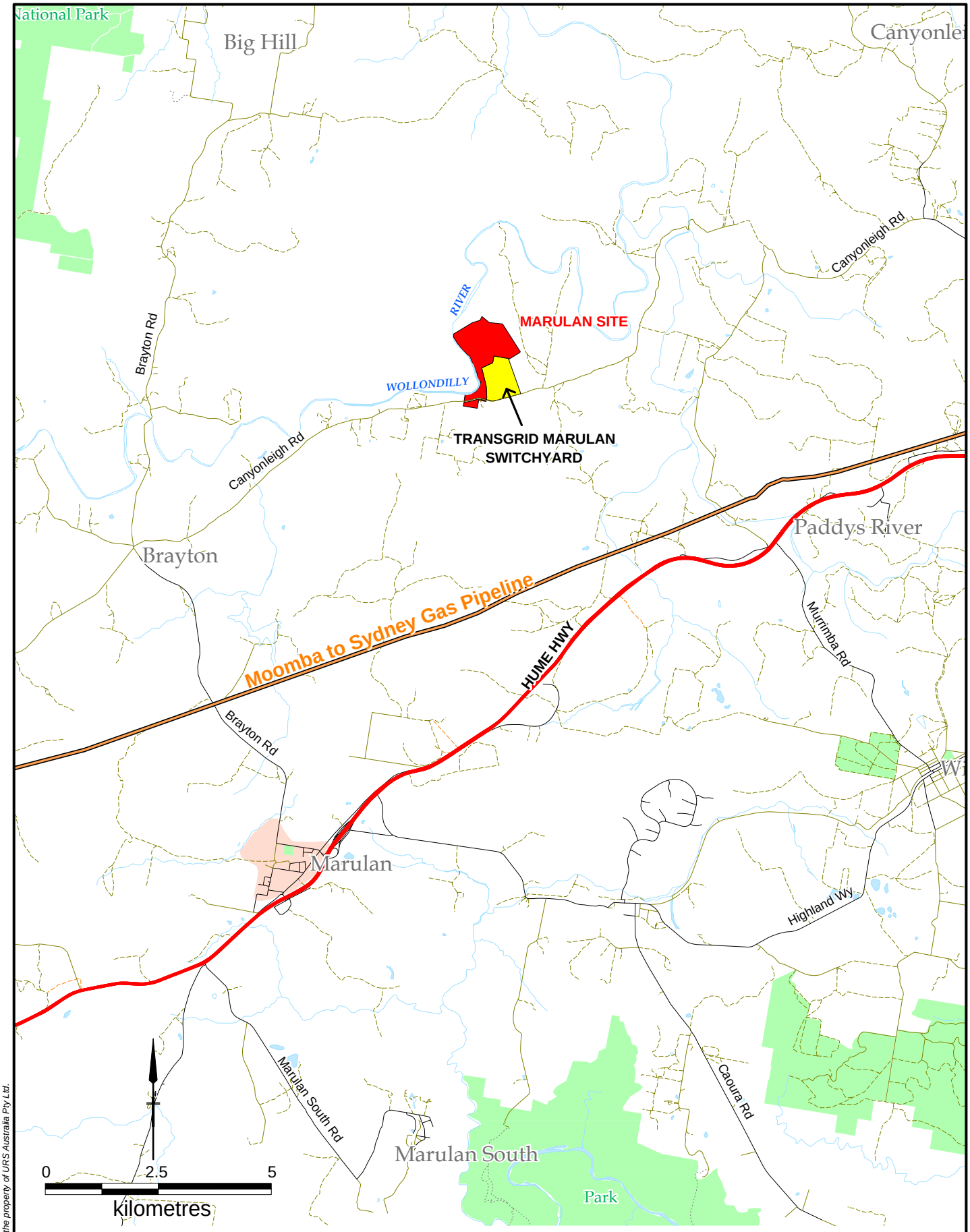
To assist in meeting the predicted short term deficit in NSW's peak electricity generating capacity Delta Electricity proposes to construct an electricity generating facility consisting of two open cycle gas turbines at a site adjacent to the existing TransGrid Marulan 330/132kV Switchyard site (TransGrid switchyard). To meet its purchasing requirements and to assist in meeting the deficit in NSW's peak electricity generating capacity, EnergyAustralia also proposes to construct an electricity generating facility consisting of two open cycle gas turbines to provide electricity in peak demand periods.

This type of generating system represents one of the most effective options to provide electricity to the grid at short notice and is therefore well suited to provide electricity in peak demand periods. The open cycle gas turbines could also be converted to combined cycle turbines to generate base load electricity. The conversion of Delta Electricity's open cycle Facility to a combined cycle Facility will be driven by the demand for electricity. Delta Electricity may seek Ministerial approval and progress with the construction and operation of a combined cycle plant directly rather than in a staged manner.

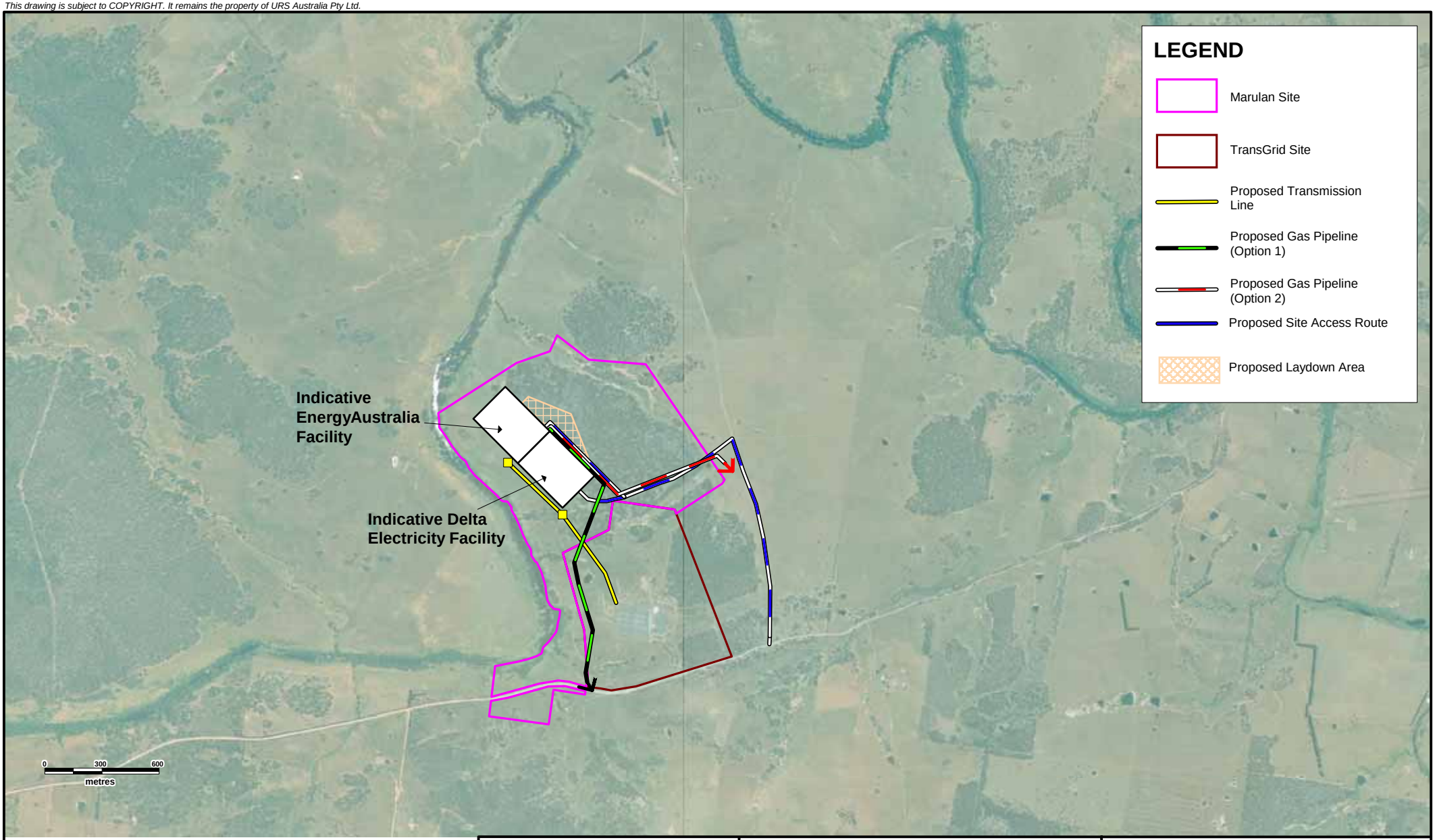
The Marulan Site is being considered by Delta Electricity and EnergyAustralia for both their proposed Facilities. The two separate Facilities would be constructed side by side on the Site, and owned and operated independently. The Site lies approximately 12 km north of Marulan and 25 km east of Goulburn (refer to **Figures 1-1, 1-2** and **1-3**).



Client: ENERGYAUSTRALIA	Project: MARULAN GAS TURBINE FACILITY	Title: **REGIONAL LOCATION MAP**
URS	Drawn: AJW; Approved: NB; Date: 12/05/2008	Figure: **1-1**
	Job No: **43177371**; File No: 43177371-001n.wor	



Client	Project	Title
ENERGYAUSTRALIA	MARULAN GAS TURBINE FACILITY	**LOCAL CONTEXT MAP**
URS	Drawn: AJW | Approved: NB | Date: 12/05/2008	Figure: **1-2**
	Job No: **43177371** | File No: 43177371-001m.wor	



Source: Delta Electricity, EnergyAustralia, Southern Cross Consulting Surveyors

Client: ENERGYAUSTRALIA	Project: MARULAN GAS TURBINE FACILITY		Title: **INDICATIVE LOCATION AND LAYOUT**
URS	Drawn: AJW	Approved: NB	Date: 02/09/2008
	Job No: **43177371**	File No: 43177371-153.wor	Figure: **1-3**

EnergyAustralia's Gas Turbine Facility

The EnergyAustralia Gas Turbine Facility would comprise the following main elements:

- gas turbine facility including ancillary equipment, process control system and administration facilities; and
- associated infrastructure within its lot i.e., connection to the electricity transmission line, connection to the gas inlet receiver, internal roads and water storage.

EnergyAustralia is proposing construction in a single stage and operation of two open cycle gas turbines in a peaking role. Each turbine could have a capacity in the order of 175 MW, producing a total nominal Facility output of 350 MW. Except for emergencies as allowed for in its proposed operating licence, the EnergyAustralia Facility would operate on an as-required, intermittent basis for a total maximum period of up to 10 % of any year.

Delta Electricity's Gas Turbine Facility

The Delta Electricity's Gas Turbine Facility would comprise the following main elements:

- gas turbine facility including ancillary equipment, process control system and administration facilities; and
- associated infrastructure within its lot, i.e. connection to the electricity transmission line, connection to the gas inlet receiver, internal roads and water storage.

The implementation of the proposed for Delta Electricity Facility would be carried out in two stages:

Stage 1 Two open cycle gas turbines with a total capacity in the range of 250 to 350 MW. Each turbine could have a capacity in the order of 125 to 175 MW depending on final equipment selected.

Stage 2: Conversion to a combined cycle facility to generate electricity for intermediate/base load electricity demand. The proposed capacity of the Stage 2 combined cycle Facility is in the range of 400 to 450 MW.

The transmission line required would be approximately 1200 m in length as shown in the indicative layout in **Figure 1-3**.

Stage 1 would operate during times of peak electricity demand. This is anticipated to occur for approximately 5 % of the year, equivalent to approximately 500 hours per year. Stage 2 would operate as an intermediate to base load plant and, depending on demand, would operate at approximately 90 % capacity.

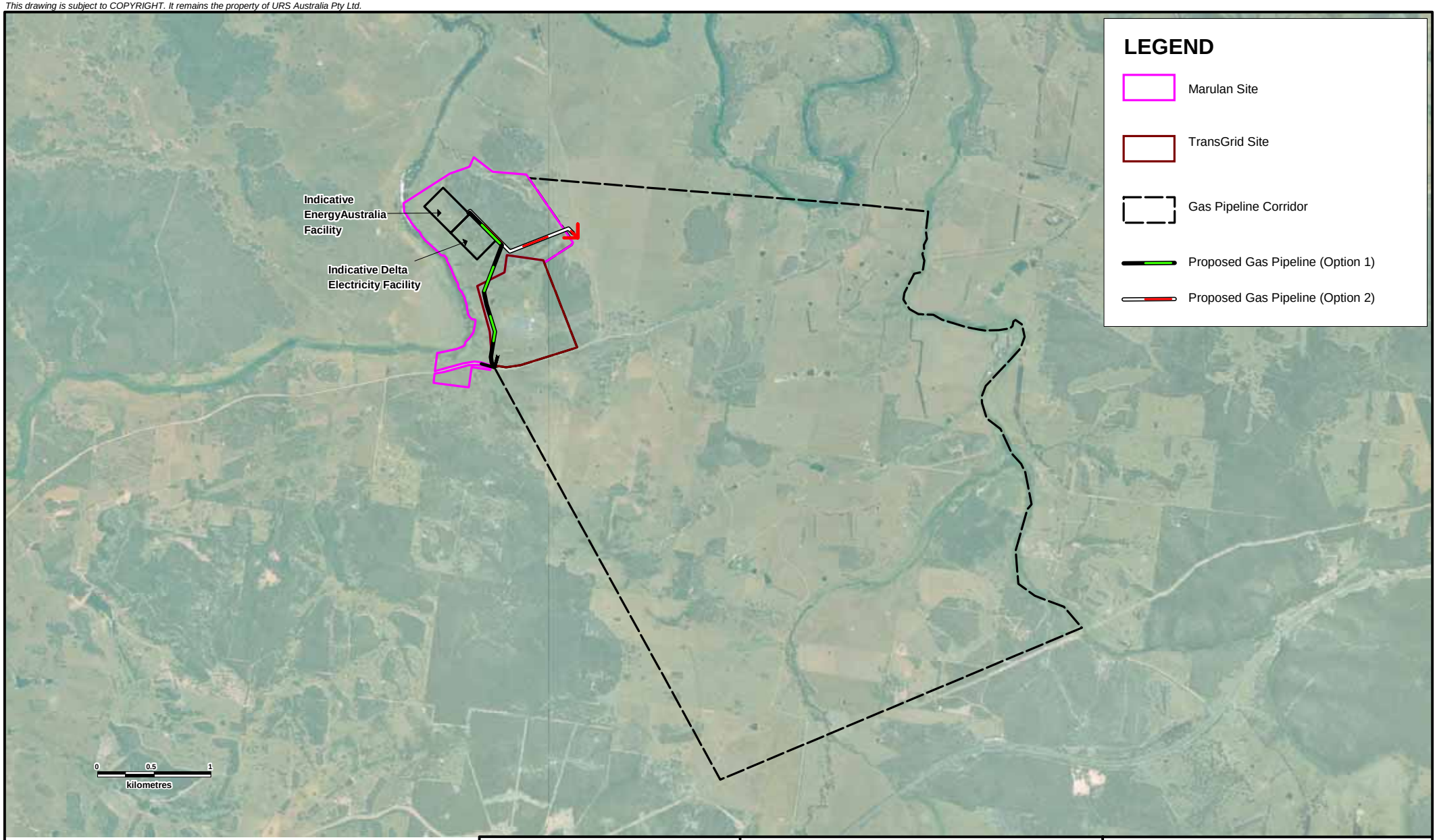
Infrastructure

The development also requires the following infrastructure:

- access road;
- transmission line; and
- gas pipeline to connect to the Moomba to Sydney gas pipeline.

A corridor has been identified for location of the gas pipeline as shown in **Figure 1-4**.

These elements have been addressed in the *Concept Application.*



Client: ENERGYAUSTRALIA	Project: MARULAN GAS TURBINE FACILITY	Title: **GAS PIPELINE CORRIDOR**
URS	Drawn: AJW · Approved: NB · Date: 02/09/2008	Figure: **1-4**
	Job No: **43177371** · File No: 43177371-174.wor	

1.3 Project Objectives

The key objectives of the EnergyAustralia Facility are to:

- provide increased reliability of supply during peak demand periods;
- provide improved security of electricity supply during system emergency or supply interruptions;
- provide improved environmental outcomes due to lower greenhouse gas emissions per unit of output compared to conventional coal-fired power generation technologies;
- maintain the ability to quickly convert to a base load plant should there be a substantial increase in base load electricity demand; and
- provide social and economic benefits associated with the ability of the NSW supply network to meet peak energy demands in the short term and base load demands in the longer term.

1.4 The Proponent

EnergyAustralia is a NSW State Owned Corporation constituted under the *Energy Services Corporations Act 1995*. EnergyAustralia operates the largest electricity network in Australia, supplying electricity to more than three million people across more than 20,000 square kilometres of Sydney, the Central Coast and the Hunter Valley. EnergyAustralia is also an electricity and gas retailer servicing customers across the eastern seaboard of Australia.

1.5 Environmental Assessment Process

The NSW *Environmental Planning and Assessment Act 1979* (EP&A Act), and its supporting legislation, the *Environmental Planning and Assessment Regulation 2000* (EP&A Regulation), provide the framework for development and environmental assessment. Part 3A of the EP&A Act relates to a category of development known as “Major Projects”. *State Environmental Planning Policy (Major Projects) 2005* (Major Projects SEPP) identifies categories of development, which are considered to be Major Projects to which Part 3A of the EP&A Act applies.

1.5.1 Major Projects

The proposed Facilities and associated infrastructure at the Marulan Site are considered to be a Major Project pursuant to clause 24 of Schedule 1 of the Major Projects SEPP entitled *'Electricity Generation'* as it is development for the purpose of electricity generation that has a capital investment value of more than $30 million. On 8 October 2007, the Director-General declared that the Project was considered a Major Project and to be assessed under the provisions of Part 3A.

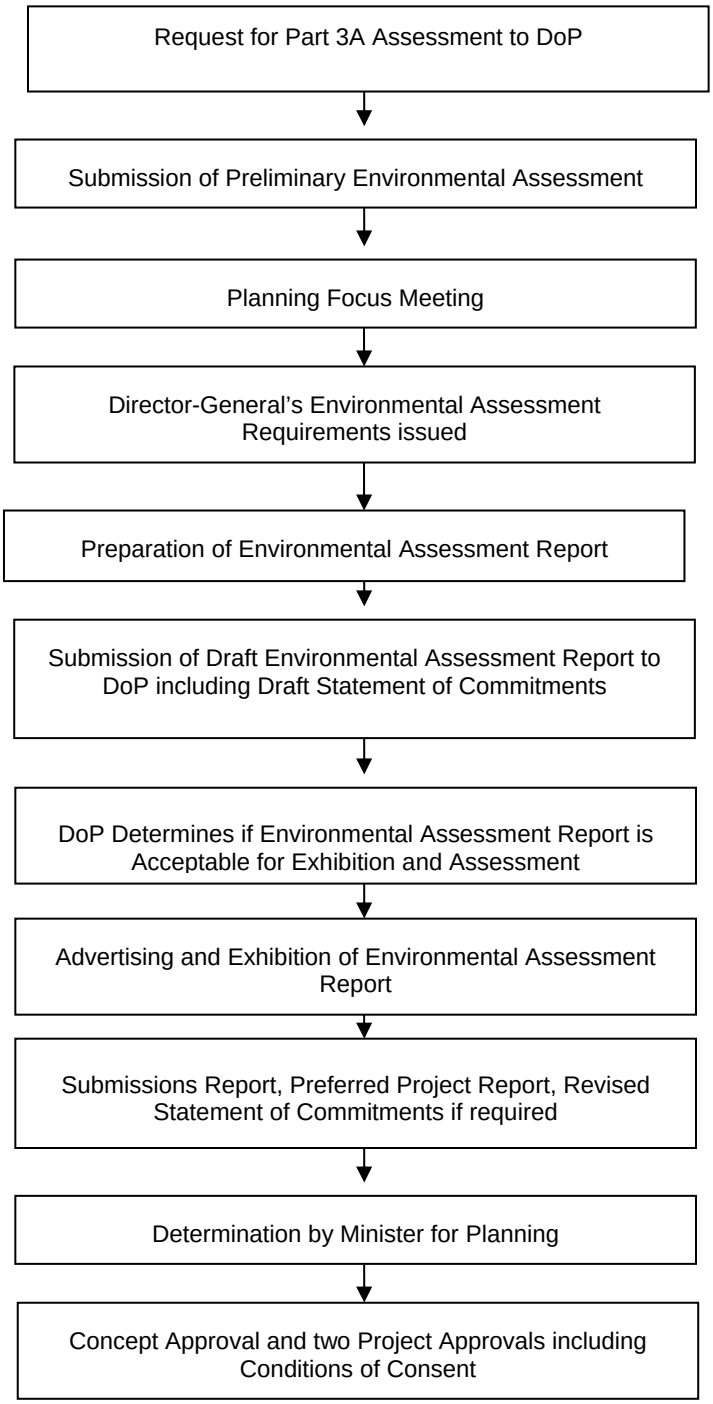
In addition, in accordance with the declaration of the Minister for Planning on 26 February 2008 that certain power generating facilities were to be designated “critical infrastructure projects”, the Project falls within this declaration as it has the capacity to generate more than 250 MW and is the subject of an application lodged prior to 1 January 2013.

Chapter 1 Introduction

On 3 March 2008 the Director-General of the Department of Planning (DoP) issued Environmental Assessment Requirements pursuant to section 75F(2) of the EP&A Act to Delta Electricity and EnergyAustralia (refer to **Appendix A** for the Director-General's Environmental Assessment Requirements and a summary table of how these assessments address the requirements).

A flow diagram of the assessment process under Part 3A of the EP&A Act is shown in **Figure 1-5**.

Figure 1-5 Approval Process under Part 3A of EP&A Act



1.5.2 Application Overview

This Environmental Assessment is part of a suite of **three** documents. The three documents are:

- **Marulan Gas Turbine Facilities – Joint Concept Application** seeking:
  - **Concept Approval** for *all* components of the proposed Marulan Gas Turbine Facilities; and
  - **Project Approval** for the Common Shared Works.
- **Delta Electricity Marulan Gas Turbine Facility – Project Application** seeking approval for Stage 1 of its Facility and **Concept Application** for Stage 2.
- **EnergyAustralia Marulan Gas Turbine Facility – Project Application** *(this document)* seeking approval for its Facility.

1.5.3 Definitions

For the purpose of the Environmental Assessment, the following definitions apply:

- **Project:** Construction and operation of two separate Gas Turbine Facilities and associated infrastructure.
- **Marulan Site or Site:** The location proposed for the Gas Turbine Facilities, which is a portion of land surrounding the existing TransGrid switchyard site as shown in **Figure 1-3.**
- **Delta Electricity Facility:** The proposed Delta Electricity Facility (Stage 1 and Stage 2) and the portion of the Site on which the Delta Electricity Facility would be located. Approximately 12.8 ha would be the Facility pad area (or footprint).
- **EnergyAustralia Facility:** The proposed EnergyAustralia Facility and the portion of the Site that the EnergyAustralia Facility would be located. Approximately 12.8 ha would be the facility pad area (or footprint).
- **Facilities**: Collective reference to the Delta Electricity and EnergyAustralia Facilities.
- **Proposed Laydown Area:** The portion of the Site where the laydown area may be located. For the purpose of this assessment, this area is considered as a single area for the two proponents. It is noted that this entire area may not be required as laydown area.
- **Common infrastructure:** The portion of the Site where the following common infrastructure would be located:
  - proposed Laydown Area; and
  - portion of the gas pipeline within the Marulan Site.

- **Common Shared Works:**
  - bulk earthworks on the Site noting that works may be staged;
  - access road from Canyonleigh Road noting that the portion along the current access into the adjacent property will be under an existing easement and a formed road; and
  - transmission line connection to the TransGrid switchyard.
- **Gas Pipeline Corridor:** The area between the Marulan Site and the Moomba to Sydney gas pipeline identified as a corridor in **Figure 1-4**. The final route of the pipeline would be defined in a subsequent project application.
- **Development footprint:** The construction footprint for the proposed development comprising the Delta Electricity Facility footprint, the EnergyAustralia facility footprint, and indicative footprint for the Common Shared Works.
- **Marulan Gas Turbine Facilities or Facilities:** Collective term for development of both the Delta Electricity and EnergyAustralia Facilities on the Marulan Site.

1.5.4 Joint Concept Application

The Environmental Assessment seeking Concept Approval for *all* components of the proposed Marulan Gas Turbine Facilities, being:

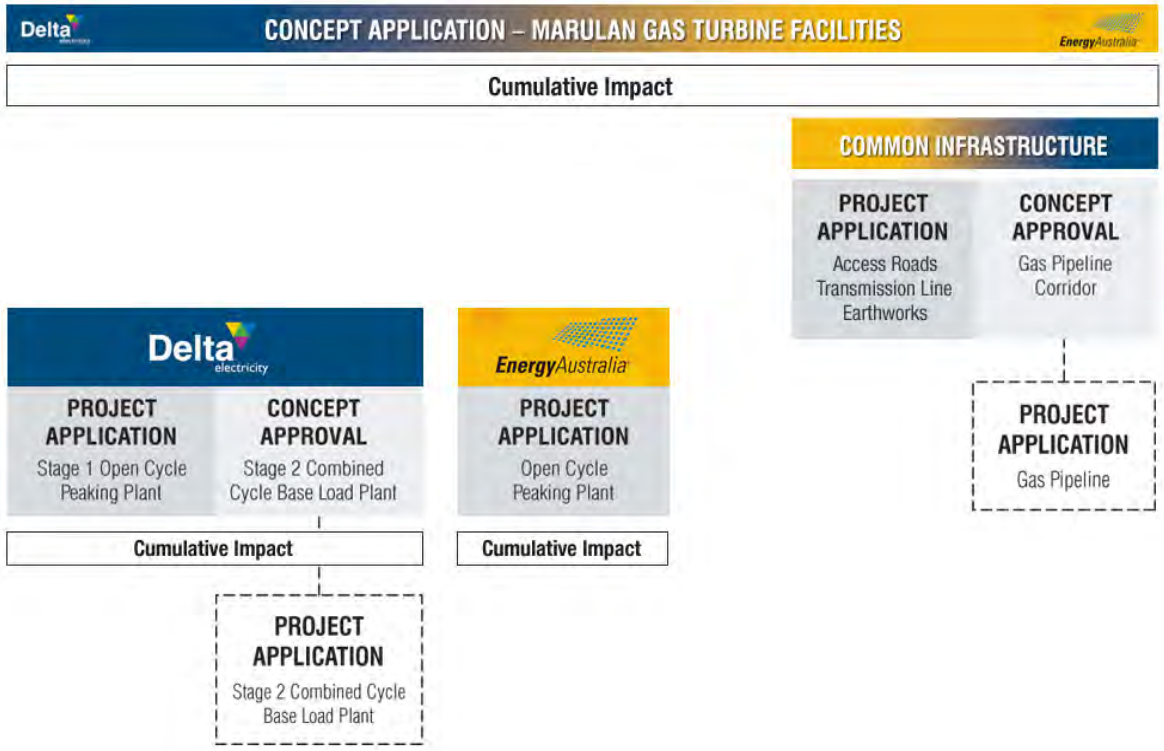
- Delta Electricity's Facility (Stage 1 and Stage 2);
- EnergyAustralia's Facility;
- Common Shared Works; and
- gas pipeline.

That *Concept Application* also concurrently seeks Project Approval for ***Common Shared Works***, that is:

- bulk earthworks on the Site;
- access road; and
- transmission line.

Figure 1-6 identifies the approvals process being pursued.

Figure 1-6 Overview of Approvals Required by Delta Electricity and EnergyAustralia



1.5.5 Project Applications

EnergyAustralia

EnergyAustralia is separately submitting an application for its Facility **(this assessment)**. That assessment will address in detail its Facility and will be a ***Project Application*** seeking approval their Facility. The assessment will address construction (beyond Common Shared Works) and operation of the Facility. The detailed impact assessment of the EnergyAustralia Facility and the cumulative impact assessment of the two Facilities will be presented in that separate application.

Delta Electricity

Delta Electricity is separately submitting an application for its Facility. That assessment will address in detail Stage 1 and Stage 2 of the Facility. The assessment will be a ***Project Application*** seeking approval for Stage 1 of its Facility and ***Concept Application*** for Stage 2 *(herein referred to as Project Application for ease of reference)*. The assessment will address construction (beyond Common Shared Works) and operation of the Facility. The detailed impact assessment of the Delta Electricity Facility and the cumulative impact assessment of the two Facilities will be presented in that separate application.

Chapter 1 Introduction

1.6 Environmental Assessment Preparation and Exhibition

The Environmental Assessment has been prepared in accordance with Part 3A of the EP&A Act and the Director-General's Environmental Assessment Requirements.

The objectives of the Environmental Assessment are to:

- comply with the requirements of the EP&A Act, as formalised in the Director-General's Environmental Assessment Requirements;
- provide the Minister for Planning with sufficient information to determine the environmental impacts and benefits of two separate Gas Turbine Facilities at the Marulan Site; and
- inform the community about the Gas Turbine Facilities proposals.

1.6.1 Planning Focus Meeting

A Planning Focus Meeting was held on 15 January 2008 with the following stakeholders:

1. NSW Department of Planning;
2. NSW Department of Environment and Climate Change;
3. Department of Water and Energy;
4. Sydney Catchment Authority;
5. Goulburn Mulwaree Council;
6. Upper Lachlan Shire Council;
7. Delta Electricity; and
8. EnergyAustralia.

1.6.2 Decisions and Assessments

Following exhibition of the Environmental Assessment, copies of all submissions or a report of all issues raised will be provided to Delta Electricity and EnergyAustralia and relevant Government authorities. Delta Electricity and EnergyAustralia will review the submissions and respond to issues raised.

The Director-General will prepare an assessment report on the Marulan Gas Turbine Facilities, which will take into account comments from relevant Government authorities as well as other stakeholders and the community. The assessment report will be provided to the Minister for Planning who will determine whether to grant approval for the Facilities and conditions under which the Facilities will operate in accordance with the EP&A Act.

1.6.3 Key Assessment Requirements

The Director-General's Environmental Assessment Requirements for the Project Application identify specific issues to be addressed in the Environmental Assessment. These comprised review and assessment of:

- water quantity and quality impacts;
- greenhouse gases;
- air quality impacts;
- noise impacts;
- flora and fauna impacts;
- indigenous heritage; and
- hazard and risk impacts.

These key issues are addressed through specific investigations that were completed by specialists for which separate reports have been developed. These investigations were used as source materials for this Environmental Assessment and are submitted as components of this Concept Application. Where these investigations are very detailed they are presented in **Volume 2 Appendices** and summaries are provided in the relevant sections of this main report. In other instances the whole assessment forms the relevant section of this main report.

1.6.4 Cumulative Assessment

A cumulative assessment will address the impact of the construction and operation of the two Facilities. The following environmental issues will require cumulative assessment:

- water quantity and quality impacts;
- greenhouse gases;
- air quality impacts;
- noise impacts;
- flora and fauna impacts;
- cultural heritage; and
- hazard and risk impacts.

Chapter 1 Introduction

1.6.5 General Environmental Risk

The Director-General's Environmental Assessment Requirements state that the Environmental Assessment must consider environmental risks that may lead to potential environmental impacts associated with the Project. Further to the issues listed in **Section 1.6.3** above, additional issues that were considered relevant to this Project included:

- soils, geology and groundwater;
- traffic and transport;
- visual amenity;
- land use;
- bush fire; and
- socio economic.

As noted in **Section 1.6.3**, summaries of these investigations are provided in the relevant sections of this main report with the detailed assessments provided in **Volume 2 Appendices**.

1.7 Document Structure

The Environmental Assessment document is divided into the following parts. The content of each part is outlined below:

- ***Executive Summary*** – provides a brief description of the key issues and findings detailed in the other parts of the Environmental Assessment.
- ***Part A: Project Description*** – **Chapter 1** briefly outlines the environmental impact assessment process, describes the background and context to the Project and provides an outline of the proposed Marulan Gas Turbine Facilities. **Chapters 2 to 4** detail the needs, justification, objectives and alternatives of the Project and provides a detailed description of the proposed components of the Marulan Gas Turbine Facilities: Delta Electricity, EnergyAustralia and Common Shared Works and gas pipeline. **Chapter 5** includes the relevant Commonwealth and State legislation, and nominates the various licences and approvals required to enable the proposed Gas Turbine Facilities to proceed. **Chapter 6** summarises the issues raised during consultation with statutory and other relevant authorities, and the local community.
- ***Part B: Environmental Assessment*** – **Chapters 7-18** are presented by issue (air, noise etc) and provide an overview of the existing environment and an assessment of the likely impacts and the identification of appropriate mitigation measures to safeguard the environment for each of the Facilities, common Shared Works and gas pipeline. In the case of the Facilities, the assessment provided is a summary of the cumulative impact of the two Facilities. The detailed cumulative assessment is presented in the *Project Applications*. In the case of the gas pipeline the assessment provides a desktop analysis of the key issues for location of the gas pipeline supporting a *Concept Application*. For the Common Shared Works, a detailed assessment specifically of the likely impacts of the Common Shared Works and the identification of appropriate mitigation measures to safeguard the environment supporting a *Project Application* for these elements is provided.

- ***Part C: Commitments and Conclusion***
  - *Draft Statement of Commitments* – **Chapter 19** outlines EnergyAustralia's commitment to proposed environmental management measures to safeguard against any potential impacts, and ongoing monitoring.
  - *Conclusion* – **Chapter 20** addresses the principles of Ecologically Sustainable Development (ESD) and provides justification for the proposed Marulan Gas Turbine Facilities.
  - *References* – provides a list of materials referenced during preparation of the Environmental Assessment.
- ***Appendices*** – This part contains the correspondence received and the detailed assessments conducted for the Environmental Assessment.