12. Justification and conclusion

12.1 Project need and objectives

As discussed in Section 5.2.2, peak energy demand in NSW is growing at a faster rate than average demand (NSW Government 2004). Furthermore, it has been predicted that NSW is likely to experience a summer peak deficit or shortfall below the low reserve condition by 2013/14, unless additional generation capacity is provided to cater for this deficit (National Electricity Market Management Company 2007b).

Failure to address the predicted supply-demand electricity shortfall is likely to have significant social and economic impacts for NSW, due to the increased unreliability of supply during critical periods, resulting in more frequent black outs and increased costs to electricity retailers and consumers.

Development of the Wellington gas-fired peaking power station would contribute to the identified need for additional generation capacity during periods of peak demand. The proposed power station would have the least possible environmental and social impacts and would achieve the following objectives:

- *providing electricity at short notice during periods of peak demand* — The proposed power station is based on open-cycle gas turbine technology that has a start up time of approximately 6 minutes, meaning it could provide electricity to the NSW network at short notice during peak demand periods.
- *providing electricity using best available technology and with low greenhouse gas emissions* — Section 6.1 identified and discussed a number of suitable technology options available to supply electricity during peak demands. Open-cycle gas turbine technology has been selected for this project because it currently represents the most commercially viable and proven technology suited for peaking plant operations. The greenhouse intensity of an open-cycle gas turbine facility is significantly lower than coal-fired power generation and would help to reduce the NSW pool coefficient. A peaking plant will allow for more accurate supply of electricity than an additional base-load plant, in line with consumer demand, thereby reducing wasteful consumption of finite resources.
- *optimising use of existing electricity supply infrastructure* — Locating the proposed power station adjacent to TransGrid's existing Wellington 330/132 kilovolt substation will ensure optimum transmission of generated electricity into the grid without the requirement for major additional transmission infrastructure, thus minimising the environmental and social impact of the project.
- *establishing electricity supply that is market-competitive and consistent with current trends and future energy demands* — The project has been developed based on currently available market information relating to existing and projected peak energy demands, gas supply prices and other relevant factors. The open-cycle gas turbine facility could be converted to a combined-cycle gas turbine facility, should future market conditions and energy demand requirements become favourable for such a conversion.

- *producing socially acceptable environmental outcomes* — The project has been designed to minimise environmental and social impacts by using 'avoid by design' principles'. That is, engineering the plant correctly at the design phase rather than relying on continual maintenance and management. The assessments provided in Chapter 9 conclude that the project would have minimal adverse impact on the biophysical environment.

The project would also provide both short and long-term economic benefits; construction of the project would provide short-term economic benefits to the local community; and long-term economic benefits would be gained throughout NSW due to the improved reliability of electricity supply during peak demand periods.

12.2 Ecologically sustainable development

The *National Strategy for Ecological Sustainable Development* defines ecologically sustainable development (ESD) as 'using, conserving and enhancing the community's resources so that the ecological processes, on which life depends, are maintained and the total quality of life, now and in the future, can be increased' (Department of the Environment and Heritage 1992). The concept of ESD gives formal recognition to environmental and social considerations in decision-making to ensure that current and future generations enjoy an environment that functions as well as, or better than, the environment they inherited.

The NSW Government is committed to ensuring that its projects are undertaken in a manner that is consistent with the principles of ESD. In accordance with Schedule 2 of the Environmental Planning and Assessment Regulation 2000, a justification for the project should be provided according to the principles of ESD. The four principles of ESD, as set out in Schedule 2 of the Regulation, are:

- the precautionary principle
- intergenerational equity
- conservation of biological diversity and ecological integrity
- improved valuation and pricing of environmental resources.

Justification for the project against the principles of ESD is provided below.

12.2.1 Precautionary principle

The *Protection of the Environment Administration Act 1991* defines the precautionary principle to mean that 'if there are threats of serious or irreversible damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation'.

This principle was developed in response to the great difficulty of interpreting scientific data. Scientific methods produce results based on confidence limits that are controlled by the scope of data acquisition, interpretation methods and general understanding within a particular scientific discipline. On occasion they have been used to validate a lack of response to a potential threat of serious or irreversible environmental degradation. ESD requires that uncertainty and the associated level of risk be considered in decision making.

The scope and methodology adopted for this Environmental Assessment was derived based on consultation with relevant government agencies, the community and other stakeholders, and adopts best practice environmental standards as goals wherever practicable. The environmental impacts associated with the project have been thoroughly assessed and are well understood. A variety of options has been considered in the design of the project, including the 'do nothing option' — this option has been rejected as it does not address the need for the project.

The Environmental Assessment does not identify any threats of serious or irreversible environmental harm as a result of proceeding with the project, given the application of the identified mitigation measures. Many of the mitigation measures and commitments outlined in Chapters 9 and 10, and 11 respectively, are designed to ensure that the environment would not be threatened by serious or irreversible damage as a result of the construction and/or operation of the project.

12.2.2 Intergenerational equity

Intergenerational equity requires that the present generation ensures the health, diversity and productivity of the environment are maintained or enhanced for future generations (Department of Urban Affairs and Planning 1995). Related to this is social equity, which involves value concepts of justice and fairness so that the basic needs of all sectors of society are met and there is fair distribution of costs and benefits to improve the well-being and welfare of the community, population or society. Social equity also includes intergenerational equity, which requires that the present generation ensures that the health, diversity and productivity of the environment are maintained or enhanced for future generations (Department of Urban Affairs and Planning 1995).

Through careful selection of the project design (see Chapters 6 and 7), ERM Power has sought to minimise impact(s) on the environment, in order to ensure that future generations have the same (or better) benefits in comparison to those of the present. Expected social benefits of the project for the local community are discussed in Section 10.4. In addition, the concerns of the community identified through consultation during preparation of this Environmental Assessment have been addressed and are discussed in Chapter 4.

12.2.3 Conservation of biological diversity and maintenance of ecological integrity

Biological diversity refers to the diversity of genes, species, populations, communities and ecosystems and the linkages between them. Biological resources provide food, many medicines, fibres and industrial products. They are also responsible for providing ecological services such as maintaining soil fertility and the supply of clean and freshwater (Harding et al. 1994).

The principle of conserving biological diversity and maintaining ecological integrity requires that biological diversity and ecological integrity be considered as a fundamental part of decision-making. The project is consistent with the conservation of biological diversity and ecological integrity. A comprehensive examination of terrestrial ecology has been undertaken with specific focus on endangered ecological communities and threatened species potentially affected by the project. Significance assessments for these endangered ecological communities and threatened species have been undertaken and have determined that the project would not have a significant or adverse impact on them (see Section 9.5).

12.2.4 Improved valuation and pricing of environmental resources

This principle establishes the need to determine economic values for services provided by the natural environment, such as the atmosphere's ability to receive gaseous emissions, cultural values and visual amenity. Applying standard methods for valuation and pricing of environmental resources is a difficult process, due largely to the intangible nature of much of the natural environment. The environment has conventionally been considered a free resource as environmental factors have been excluded from determining the real cost of an activity. The process of identifying the impacts of a project on the environment and the services it provides (such as clean air or biological diversity) and formulating mitigation actions to ameliorate those impacts recognises the value of those resources. The indicative costs to the environment are shown by the cost of the mitigation measures and safeguards. The costs of those measures have, therefore, been included in the costs of the project.

This Environmental Assessment has examined the environmental consequences of the proposal and identified mitigation measures to address adverse impacts — these are summarised in Chapters 9 and 10. An indirect indication of the value of the environmental resources would be the cost of the proposed mitigation measures. The cost of these mitigation measures would be included in the project budget, demonstrating that the value of the environmental resources affected by the project would be maintained or enhanced. Therefore, the affected environmental resources would be acknowledged and provided for in the project. The mitigation measures proposed would preserve and improve environmental conditions and hence, the value of environmental resources.

12.3 Summary of justification

The major benefits of the project are summarised below:

- The project would provide electricity at short notice during periods of peak demand.
- The project would assist in electricity demand management through short start-up and shut-down time.
- The project would improve electrical system security, stability and emergency response (i.e. during black outs).
- The project would generate electricity using best available technology and producing minimal greenhouse gas emissions.
- The project would generate electricity that is market-competitive and consistent with current trends and future energy demands.

Section 12.1 demonstrates that the project is justified in relation to the project objectives. Section 12.2 demonstrates that the project is consistent with the principles of ESD.

The project is justified based on the above considerations, as it clearly represents the best solution in terms of environmental, social and economic outcomes, and meets the requirements and expectations of ERM Power, the NSW Government and the community to deliver a reliable and effective electricity generation project that can adequately meet the peak energy demands expected in NSW over the next 3 to 5 years. The low carbon emissions of this power station design, relative to diesel or petroleum peaking plants, would ensure the plant is responsive to legislative changes in the future, such as the implementation of an emission trading scheme or a 'cap and trade' system.

12.4 Conclusion

The Environmental Assessment demonstrates that the project has a strong justification for proceeding, considering the benefits it would provide in meeting forecast peak electricity demand in NSW (see Section 12.3).

This Environmental Assessment has considered the potential impacts of the construction and operation of a proposed gas-fired peaking power station in Wellington, NSW. It has been prepared in accordance with the provisions of Part 3A of the *Environmental Planning and Assessment Act 1979* and the Director-General's Environmental Assessment requirements (DGRs), and issues raised by other statutory agencies.

A range of impact assessments, with a focus on the key issues identified in the DGRs, were prepared and documented within this report. These are detailed in Chapters 9 and 10, and are outlined below.

- *noise impacts* — The location, orientation and design of the power station has been selected to minimise impacts on sensitive receptors. However, adopted noise design goals would be exceeded at some properties during normal and/or adverse meteorological conditions. Mitigation measures recommended in Section 9.3 would ensure the best management outcomes.
- *impacts on air quality* — Air quality assessments indicate that the project would have minimal impact on regional air quality. Air emissions would be minimised during construction and operation through the adoption of best practice technology and the implementation of reasonable and feasible mitigation measures.
- *impacts on flora and fauna* — Construction of the gas supply pipeline would require clearing of an estimated 4.2 hectares of vegetation; construction of the power station would require the removal of approximately 20 paddock trees (the site is already heavily modified and cleared of most vegetation). Significance assessments have been conducted for endangered ecological communities and threatened species, and have determined that the project would not result in a significant impact on these communities or species.
- *greenhouse gas generation* — The greenhouse intensity modelled for the power station is considerably less than comparable power stations of different types, particularly coal-fired plants, but higher than renewable energy sources such as wind or solar. The relatively quick start-up and shut-down of the proposed peaking power station would allow it to respond to consumer demand much faster than renewable energy, and with much less waste in electricity and greenhouse gases than a base-load power station.
- *hazards and risk impacts* —The proposed power station, gas pipeline and compressor station will be designed and operated as secure operating facilities, such that the project would operate within acceptable limits of hazards and risk.
- *impacts on the local community including disruption during construction* — Construction impacts including traffic, noise and dust have been minimised through implementation of the 'avoid by design' principle, and would be further mitigated by implementing a construction environmental management plan.

Management and mitigation measures to protect the environment for the duration of the project are detailed in Chapters 9 and 10, a draft Statement of Commitments summarising these is provided in Chapter 11.

In conclusion, it is considered that, with the adoption of the proposed environmental management measures and safeguards proposed by ERM Power, the potential environmental impacts can be adequately mitigated and managed.