

20.1 Ecologically Sustainable Development

The *Environmental Planning and Assessment Regulation 2000* requires that an Environmental Assessment include:

"The reasons justifying the carrying out of the development or activity in the manner proposed having regard to biophysical, economic and social considerations and the principles of ecologically sustainable development."

The principles of Ecologically Sustainable Development, as listed in the Regulation, are as follows:

"The precautionary principle - namely, that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation."

Inter-generational equity - namely, that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations."

Conservation of biological diversity and ecological integrity."

Improved valuation and pricing of environmental resources."

20.1.1 The Precautionary Principle

AGL's precautionary approach is demonstrated by the design and management controls to be implemented as part of the Project. The controls proposed specifically address the threat of serious or irreversible damage from:

- land use change;
- air emissions;
- noise emissions;
- surface water discharges;
- soil and groundwater contamination;
- impacts on flora and fauna;
- visual impacts;
- damage to cultural artefacts;
- wastewater disposal; and
- potential hazards.

Monitoring of these aspects would be carried out in accordance with regulatory and licence requirements. Through appropriate monitoring, the lack of full scientific certainty regarding any potential environmental impacts can be addressed and the precautionary principle appropriately applied. Where deviations from expected conditions are recorded, the matter would be investigated immediately and appropriate action taken as necessary, to prevent any adverse environmental impact as required by the Environmental Management Plans (Construction and Operation) for the proposed Project.

The Project would utilise modern technology with known consequences and effects. The technology proposed represents the best industry standard for modern power plants and is used throughout the world by the leading electricity generating companies.

20.1.2 Inter-Generational Equity

The type of power plant proposed, has been designed to aid in the longevity and improved quality of the environment for future generations and thereby meet the principles of inter-generational equity in the following ways:

- the use of gas fired technology which has less environmental impacts than traditional coal fired technology, through the elimination of a need to mine, transport and store coal as a fuel source;
- the use of open cycle gas turbine technology which represents industry best practice, in meeting peak load demand; and
- throughout the lifespan of the proposed Project, opportunities to minimise resources and maximise recycling and reuse of materials would be continually identified. This would be effected through the implementation of a waste management policy and associated plan, which would influence the design and management of both the construction and operational phases.

20.1.3 Conservation of Biological Diversity and Maintenance of Ecological Integrity

The proposed Project, in combination with proposed mitigation measures and biodiversity offset strategy, has been assessed as meeting the maintain or improve benchmark for of relevant species and communities.

Two EECs were found to occur within the development footprint; *White Box – Yellow Box – Blakely's Red Gum Woodland* referred to as Box Gum Woodland, listed under the TSC Act and *Natural Temperate Grassland of the southern Tablelands of NSW and the ACT* referred to as Natural Temperate Grasslands, listed under the EPBC Act. The proposed works would involve the clearing of approximately 5.94 ha of Box Gum Woodland as listed under the TSC Act and 9.07 ha of Natural Temperate Grassland listed under the EPBC Act.

Surveys have determined that Commonwealth listed Box Gum Woodland would not be impacted by the Project. A revised Commonwealth Significant Impact Criteria assessment suggests that there would only be a significant impact on the EEC Natural Temperate Grassland.

The results of the NSW Assessments of Significance indicate that the Project has the potential to result in a significant impact to the TSC Act listed EEC Box Gum Woodland, but would not result in a significant impact to any other threatened species or populations listed under the TSC Act assessed within the Flora and Fauna Assessment.

Mitigation measures would be implemented during both the construction and operational phases of the Project to address and manage potential impacts. In addition to these measures, in order to offset the potential impact of the Project on Box Gum Woodland and Natural Temperate Grassland, AGL has proposed a biodiversity offset strategy to ensure the existing ecological integrity is maintained or improved.

Implementation of the offset strategy and mitigation measures would ensure that the overall biodiversity of the local area would be 'maintained or improved'.

20.1.4 Improved Valuation and Pricing of Environmental Resources

It is difficult to assign a monetary value to the environment of the locality, given the lack of precedence and guidelines in the valuation of environmental resources not considered for commercial use. The approach taken would be to manage any environmental impacts by identifying appropriate mitigation measures to minimise adverse environmental impacts and including the cost of these safeguards in the total project cost.

AGL would invest approximately \$1.5 billion for the construction and commissioning of the Project. The cost of implementing these mitigation measures would be included in the overall cost of providing electricity to consumers hence improving the pricing of environmental resources. This approach would allow the value and price of environmental resource protection to be more accurately quantified.

20.2 Consistency with Objects of EP&A Act

An evaluation of the consistency of the Project with the objects of the EP&A Act is presented in **Table 20-1**.

Table 20-1 Consistency of the Project with objects of the EP&A Act

Object	Consistency of proposed Project with object
<p>To encourage the proper management, development and conservation of natural and artificial resources, including agricultural land, natural areas, forests, minerals, water, cities, towns and villages for the purpose of promoting the social and economic welfare of the community and a better environment.</p>	<p>The use of natural gas for the Project results in efficient use of resources for electricity generation as electricity production with gas is at a lower greenhouse intensity than the NSW average. Natural gas is a clean burning fuel and has comparatively low greenhouse gas emissions. In terms of alternate power generation technologies, open cycle gas turbines present the best balance of outcomes between the imperatives of climate change mitigation and meeting peak electricity demand while managing the price of electricity for end use consumers.</p> <p>As part of this Project, AGL propose to offset the following: 77.57 ha of Box Gum Woodland within the AGL owned lands adjoining the development footprint, and 80.71 ha of Native Temperate Grassland and 24.97 ha of exotic pasture which has the potential if managed to become Natural Temperate Grassland within the AGL owned lands adjoining the development footprint.</p> <p>Full details of the proposed management regime for this offset would be included in a management plan that would be prepared in consultation with OEH and or SEWPAC.</p> <p>While the Facility can run without water during times of shortage or restriction, process water for the Project can be sourced from a number of options. Water saving options would be considered to meet potential process water needs.</p> <p>The existing socio-economic conditions of the area along with the possible impacts of the proposed development have been examined qualitatively. The Project is expected to have positive economic and social impacts during both construction and operation phases with potential for a positive effect on the regional economy through contribution to GDP, income and employment.</p>
<p>To encourage the promotion and co-ordination of the orderly and economic use and development of land.</p>	<p>The development footprint of the proposed development traverses land zoned as RU2 Rural Landscape and RU1 Primary Production, where the proposed development is permissible with consent under the provisions of the Upper Lachlan LEP 2010..</p>

Chapter 20

Conclusions

Object	Consistency of proposed Project with object
To encourage the protection, provision and co-ordination of communication and utility services.	<p>The Project would contribute to the supply of electricity across NSW, which meets the object of providing utility services.</p> <p>AGL proposes to construct the electricity generating facility on one site, consisting of open cycle gas turbines. This type of generating system can supply electricity to the grid at short notice and is therefore well suited to providing electricity in peak demand periods. Gas turbines are known to be one of the most effective options to provide electricity for short term demand.</p>
To encourage the provision of land for public purposes.	The Project would be used for the supply of electricity to the National Electricity Market.
To encourage the provision and co-ordination of community services and facilities.	The Project benefits broader community services through the supply of electricity to the state of NSW and the National Electricity Market.
To encourage the protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats.	<p>As part of this Project, AGL has committed to conserving 77.58 ha of Box Gum Woodland within the AGL owned lands adjoining the development footprint, 80.71 ha of Native Temperate Grassland and 24.97 ha of exotic pasture that has the potential if managed appropriately to meet the criteria for recognition as the EEC Natural Temperate Grassland. The offset areas is within the AGL owned lands adjoining the development footprint (refer also to the response to object one above).</p> <p>This Environmental Assessment includes mitigation measures for reducing impact on native animals and plants as described in Chapter 13.</p>
To encourage ecologically sustainable development.	<p>Having regard to the Environmental Assessment findings and the principles of ESD, the justification for carrying out the development in the manner proposed is as follows:</p> <ul style="list-style-type: none"> - environmental issues associated with the proposed development of the Project have been fully considered; - potential impacts identified are capable of being mitigated and the proposed development does not represent a threat of serious or irreversible environmental damage; and - biological diversity and ecological integrity of the area would not be affected by the proposed development.
To encourage the provision and maintenance of affordable housing.	Not applicable.
To promote the sharing of the responsibility for environmental planning between the different levels of government in the State.	Approval is being sought for this Project under Part 3A of the EP&A Act. Involvement of different levels of government in the State is being coordinated by the Department of Planning and Infrastructure.
To provide increased opportunity for public involvement and participation in environmental planning and assessment.	<p>A consultation strategy was developed to initiate and maintain open communication with key stakeholders and to provide a forum to proactively respond and work with key community and key statutory and public authority stakeholders.</p> <p>AGL have committed to provide all relevant information to the community for their consideration and response.</p> <p>A consultation plan would be developed as part of the CEMP / OEMP to outline a coordinated, jointly managed consultation process for the Project.</p>

20.3 Environmental Assessment Findings

A brief summary of the main findings of the Environmental Assessment is presented below. Detailed descriptions of each aspect are presented in the separate sections of the Environmental Assessment. Details of environmental management and monitoring techniques and the commitments made by AGL which would be implemented for the proposed Project are presented in **Chapter 19**.

20.3.1 Bio-physical Environment

The main findings of the biological and physical environment assessment are summarised below.

Air Quality

Modelling showed that the predicted impacts on ground level concentrations of NO₂, PM₁₀, CO and SO₂, when added to peak background concentrations, were within the OEH regulatory criteria. In addition, the predicted incremental concentrations of formaldehyde were found to be within OEH criteria.

The plume rise assessment showed that under the worst case scenario, the Obstacle Limitation Surface (OLS) may be exceeded during a significant proportion of the year. Whilst this assessment is considered conservative with respect to the modelled operating times and operating conditions, consideration should be given for the plant to be designated a hazard to aircraft operators in the area. Ongoing consultation with CASA is required to ensure aviation safety.

The greenhouse gas production from the Project was estimated to be in the range of 0.41-0.90% and 0.11-0.25% of the state and national inventories, respectively. In addition, emissions from the project were estimated to be in the range of 0.85-1.85% and 0.23-0.49% of stationary energy emissions from the state and national inventories, respectively.

Soils and Geology

At present the Development Site is unmined. In the past the area around Gunning has been mined for gold, however the last recorded mining activity was in 1956. Therefore it is deemed unlikely that mine subsidence would affect the site. However, Commissioners Gold hold an exploration permit over the area. No issues were raised by Commissioners Gold during consultation with them. The mitigation measures and safeguards would ensure that soils and groundwater are satisfactorily managed using suitable design, construction and management. Accordingly any impacts on soils and groundwater resulting from the construction and operation of the proposed Dalton Power Project are likely to be negligible.

Landscape and Visual

The Visual Assessment concluded that the Project would have a low visual impact on people in areas surrounding the Site. This is due to a combination of existing trees and natural landforms, views to the stacks being generally restricted to upper portions of the stack structures, views to the lower sections of the power plant and associated infrastructure mitigated by existing trees and local undulating landform. Distant views toward the communications tower are likely to be influenced by atmospheric conditions which will tend to reduce the visibility of the tower.

Sympathetic colouring of power plant structures minimising the visual contrast between the power plant structures and, tree planting on the site and careful lighting design would further mitigate the visual impact of the proposal.

Traffic and transport

Access to the Site would be via a new access road to be developed from Walshs Road where the road takes a 90 degree turn to the west. The road would be built to comply with requirements for the purposes of constructing and operating the proposed power plant.

The traffic and transport assessment found that the arterial road network can satisfactorily and safely accept the additional traffic generated by the development during the construction, operational and maintenance phases.

Noise

The noise assessment on the whole has found that relevant noise criteria can be achieved with no further noise mitigation measures beyond those already proposed by AGL. Consequently, the impacts of the proposed construction and operation of the plant are not expected to degrade the existing acoustic environment nor create annoyance to the community surrounding the facility.

The noise assessment indicated that low frequency noise may exceed the INP Low Frequency Noise criteria at three residences. An alternative assessment of low frequency and tonal noise impacts undertaken in line with an alternative assessment model (the application of which is supported by international research), suggests that the predicted low frequency noise would not be at a level to cause annoyance to any residential receptors. Given the requirement however for assessment under the INP, AGL will commence discussions with receptors B, C and D regarding this assessment, with a view to reaching agreement with them on noise management for the project consistent with other developments.

Flora and Fauna

Two EECs were found to occur within the development footprint; *White Box – Yellow Box – Blakely's Red Gum Woodland* referred to as Box Gum Woodland, listed under the TSC Act and *Natural Temperate Grassland of the southern Tablelands of NSW and the ACT* referred to as Natural Temperate Grasslands, listed under the EPBC Act. The proposed works would involve the clearing of approximately 5.94 ha of Box Gum Woodland as listed under the TSC Act and 9.07 ha of Natural Temperate Grassland listed under the EPBC Act.

Surveys have determined that Commonwealth listed Box Gum Woodland would not be impacted by the Project. A revised Commonwealth Significant Impact Criteria assessment suggests that there would only be a significant impact on the EEC Natural Temperate Grassland.

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However, mitigation measures would be implemented during both the construction and operational phases of the Project. In addition to these measures, in order to offset the potential impact of the

Project on Box Gum Woodland and Natural Temperate Grassland, AGL has proposed a biodiversity offset strategy to ensure the existing ecological integrity of the site is maintained or improved.

Water Management

While the proposed Facility can run without water during times of shortage or restriction, process water for the Project can be sourced through a number of options. Different water saving options has been considered to meet potential process water needs. Further investigations would be undertaken to confirm the final water supply arrangement.

The main water demand for the Facility is process water, for supply of gas turbine inlet air evaporative cooling and, if installed, high fogging systems. Deionised water is required for the high fogging demand, and deionised water or high quality (low salinity) potable water can be used to supply the evaporative coolers, A process water treatment plant would be expected to be required on site, regardless of the water supply source, although the level of complexity would change depending upon the source(s) water quality. A potable water supply would be required for domestic purpose, as well as a utility water supply for miscellaneous plant uses. Fire fighting water requires dedicated storage tanks. Landscaping water would be sourced from rainwater, although this may need to be supplemented during flora establishment. There would be provision on site for the delivery of bulk water via tanker trucks.

Process wastewater is generated at the Facility by the process of blow down from evaporative air inlet coolers and wastewater streams arising from process water pretreatment. The process water treatment plant would be designed to minimise the generation of wastewater following a cost benefit analysis.

Clean rainwater collected from the Facility catchment area would be directed to a sedimentation pond. The outlet of the stormwater system would be designed to maximize the dispersion of these high flows and thereby minimise their potential to cause soil erosion downstream.

Surface water from potentially impacted process areas and bunded areas would discharge to the sedimentation pond via a sediment and oil trap. Bunds would only be drained (manually) after confirmation that the contents are uncontaminated. In the event of contamination, the bund contents would be educted and transported offsite to a licensed disposal facility.

All construction works for the Project would be undertaken in a manner to minimise the potential for soil erosion and sedimentation. Wastewater volumes have been estimated and management strategies developed to maintain zero discharge from the site except for natural surface flows.

Heritage

The field survey for the power station identified that five sites (Dalton 2, Dalton 3, Dalton 4, Dalton 5, Dalton 7), and two areas of potential archaeological deposits (DPAD1 and DPAD2) would be directly impacted by the plant footprint.

One site, DGP4 is within the footprint of the gas pipeline and access road and would be directly impacted by the Project. Another site (DGP5) is within close proximity of the pipeline and access road footprint.

Where possible, disturbance to Aboriginal archaeological sites would be avoided, however if impacts to the Aboriginal sites cannot be avoided, then the artifacts would be collected or relocated away from the area of impact.

No European sites were located as occurring within either the power station footprint, or within the gas pipeline easement area.

Land use and property impacts

Mitigation measures detailed in this Environmental Assessment relating to the control of noise levels, air and water quality, traffic and transportation, visual amenity and other environmental matters, would be implemented to ensure that the proposal is managed in an effective and efficient manner, with minimal impact on surrounding land uses during construction or operation.

Land use in the immediate surrounds of the Site is predominantly rural enterprises on medium size holdings and smaller rural home sites. Land within the AGL Site Boundary is zoned RU2 Rural Landscape, with parts of the Gas Pipeline (northern section) and Access Road, as well as the Gas Pipeline (southern section) zoned RU1 Primary Production. Zoning RU1 Primary Production and RU2 Rural Landscape, provide that “power generation” facilities are permissible with consent.

The Dalton Power Project falls within the definition of “*electricity generating works*” contained in the Upper Lachlan LEP 2010. Accordingly, the Dalton Power Project falls within the list of permissible uses of the zoning in the Upper Lachlan LEP 2010. The current zoning of surrounding areas permits activities such as agriculture, rural housing and open space.

Socio Economic

The analysis shows positive economic and social benefits at a national level in terms of contribution to Gross Domestic Product, income and employment resulting from the plant construction and operation. It is believed, that a large proportion of the benefits from the Project would eventuate in the local or state regions.

Preliminary Hazard Analysis

The results of the PHA show that the risk associated with this development is very low using mostly highly conservative assumptions. The most stringent risk criteria, as required by the Department of Planning, are adhered to.

20.4 Conclusion

Project Approval under Part 3A of the EP&A Act is being sought by AGL for the construction and operation of a gas fired power plant at Dalton near Gunning, NSW. The power plant would use natural gas as its primary fuel and have a total generating capacity of approximately 1500 MW.

The Dalton Power Project would be constructed over two stages, resulting in a maximum installation of six turbines with a nominal generating capacity of 1500 MW at the completion of both stages. The power plant would operate in open cycle mode during times of peak electricity demand and it is expected that the plant would be required to operate for up to 15 % of the year with any exceedances of this capacity to be approved by the relevant authorities.

Mitigation measures to ensure impacts to both the bio-physical and socio-cultural environment remain at an acceptable level throughout the planned lifespan of the proposed power plant have been factored in to the proposal in the following ways:

- proposed generation technology;
- specific power plant design and site layout; and
- adherence to Environmental Management Plans (EMP) including a Construction EMP and Operation EMP, which would dictate the specific environmental policies and management plans that the site would operate in accordance with.

The Environmental Assessment has been produced to ensure that the following regulatory and community requirements have been addressed:

- Environmental Planning and Assessment Act 1979;
- State Environmental Planning Policies and Regional Environmental Plans;
- specific requirements identified by the Department of Planning Director – General; and
- local residents and businesses.

Having regard to the Environmental Assessment findings and the principles of ESD, the reasons justifying the carrying out of the development in the manner proposed are as follows:

- environmental issues associated with the proposed development of the power plant have been fully considered;
- where modelling of impacts was carried out it was on the basis of the worst case scenario, considered cumulative impacts with other known facilities or major projects being considered in the same local government area, and utilised conservative assumptions; and
- potential impacts identified are capable of being mitigated and the proposed development does not represent a threat of serious or irreversible environmental damage; and

The Environmental Assessment provides a comprehensive assessment of the Project and includes investigations regarding all relevant environmental issues.

Potential adverse impacts have been assessed and strategies to avoid, minimise and mitigate those impacts form a key part of the Environmental Assessment. The Project includes a number of commitments to manage environmental impacts during its construction and operation.

This Environmental Assessment has highlighted a range of issues which would be addressed through the careful design and operation of the Project.

On the basis of the studies detailed within the Environmental Assessment, and with the implementation of the recommended mitigation measures, the Project is justified.