

Section 6

Evaluation and Justification of the Amended Project

Preamble

This section provides an evaluation of the entire amended Project through consideration of a range of elements relating to:

- the Applicant's focus upon project design and commitments to high standards of environmental performance;
- the principles of ecologically sustainable development;
- compliance with planning instruments;
- the key amendments to the 2013 Project; and
- the high quality of the coking coal within the Rocky Hill Mine Area.

A justification for the amended Project is then provided based on biophysical, social and economic considerations. The consequences of not proceeding with the amended Project are then reviewed.

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6.1 EVALUATION OF THE AMENDED PROJECT

6.1.1 Introduction

The evaluation of the amended Project is presented through the consideration of the following six elements.

- i) The emphasis placed upon project design to avoid and/or minimise adverse environmental impacts.
- ii) The Applicant's commitment to high standards of environmental performance.
- iii) The satisfaction of the principles of ecologically sustainable development.
- iv) Compliance with State planning instruments, regional strategies and the Gloucester LEP 2010.
- v) The key amendments to the 2013 Project addressing environmental issues.
- vi) The importance to the local community, NSW, Australia and Asian steel manufacturers for the production of the high quality coking coal resource within the Rocky Hill Mine Area.

6.1.2 Emphasis Placed on Project Design

Prior to and during the preparation of the EIS, the Applicant commissioned numerous environmental studies by specialist consultants over multiple fields to identify areas within the Mine Area and private haul road corridor that displayed areas with special ecological, scientific, cultural and aesthetic values. The constraints identified that relate to these values (see relevant sections within Section 4 of this document) have been avoided or mitigated where possible through the design of the amended Project and the implementation of strategies to manage and / or restore those special values.

The Applicant has focused upon designing a simpler project than was proposed in 2013 by placing emphasis upon:

- maximising the distance between project components and privately-owned properties; and
- achieving a design that provided the best possible environmental outcomes.

At the outset, it is recognised that by removing one open cut pit, the CHPP, overland conveyor, rail loop and rail load-out facility, the Applicant has reduced the area of potential impact and a number of sources of noise, dust and lighting that were inherent in the 2013 Project design, albeit with the adoption of a comprehensive range of environmental safeguards.

Examples of the design components of the amended Project that would contribute to improved and acceptable environmental outcomes are as follows.

- i) The western and northern amenity barrier has been re-designed to be more effective as a visual and noise barrier due to the increased height in some sections and far more natural appearance in terms of slopes and vegetation coverage. The design would allow the barrier to be constructed (and revegetated) progressively to limit the environmental impacts during its construction. Once constructed, the

barrier would effectively screen the bulk of on-site activities from residences in the vicinity of the Mine Area and contribute to controlling noise beyond the Mine Area.

- ii) The Applicant would further limit the visual impacts of the amended Project through the construction of two interim amenity barriers within the footprint of the permanent overburden emplacement. These barriers would be strategically placed to complement the western and northern amenity barrier in those areas where additional screening is required.
- iii) The design of the Mine Area to retain the existing mature vegetation adjacent to the northern section of McKinleys Lane would assist to visually screen much of the operational activity in the northern part of the Mine Area where the interim overburden emplacement is planned.

Further details of the western and northern amenity barrier and the two additional interim barriers are presented in Section 4.5.4.

- iv) The open cut pits have been re-designed to provide flexibility for activities within the open cut pits and maximise shielding for mobile equipment operating within the open cut pits.
- v) The ROM pad and ROM coal stockpiles would be located in the southeastern part of the Mine Area, i.e. as far as practical from the residences within the three rural-residential estates to the west through to the north of the Mine Area. Furthermore, the pad would also be surrounded by a minimum 10m high barrier to limit noise and visual impacts.
- vi) A comprehensive water management system has been designed to minimise the contamination of water by either saline water originating principally from the groundwater flows to the open cut pits, or sediments originating from disturbed areas. The water management system, together with a series of flood controls, have been designed to minimise adverse impacts upon both the groundwater and surface water resources around the Mine Area.

An important component of the water management system would be the incorporation of a water treatment plant designed to treat excess saline water on site and thereby avoid the risk of potential release of saline water into the surrounding watercourses.

- vii) The private haul road has been designed to be shielded visually for much of its length within the Site behind local ridges or existing vegetation. Construction of the haul road is proposed between 4km and 5km east of The Bucketts Way in an area distant from privately-owned residences and with negligible impacts on soils and terrestrial and aquatic ecology.
- viii) The Applicant has designed the post-mining landform in a manner that is consistent with best practice, is both aesthetically pleasing and stable, and provides for a return to viable agricultural land and improved biodiversity. The native vegetation and fauna corridors together with the supplementary plantings and management of the proposed Biodiversity Offset Area (to the east of the Mine Area) would aid in increasing the biological diversity within the local area and improving connectivity for fauna.

Over the life of the amended Project, the Applicant would monitor and refine its activities so as to reflect these objectives to the greatest extent possible. Further discussion on the Applicant's approach to design issues is provided in Section 6.3.4.

6.1.3 The Applicant's Environmental Performance and Commitments

The Applicant recognises that designing a mine that maximises environmental protection is a key component of successful environmental management. The other key attribute is the Applicant's commitment to undertake all activities in a proactive manner to a high standard. The Applicant has already demonstrated its commitment to high standards in numerous ways including the following.

- i) The Applicant has purchased (or negotiated options to purchase) almost 2 000ha of land to the southeast of Gloucester to provide an area suitable for a viable mining operation and, importantly, a buffer of almost 1 500ha around the Mine Area. The environmental assessments, particularly for noise and air quality, have identified that the land owned by the Applicant would provide an acceptable buffer such that health and amenity criteria are satisfied at all privately-owned residences, i.e. with the exception of three residences where the exceedances of the PSNL by 1 dB(A) to 5 dB(A) are predicted. The Applicant is committed to discussing noise-related matters with owners or occupiers of the three subject residences prior to the predicted periods of noise exceedances to ensure the effects of these exceedances are avoided, minimised or appropriately mitigated.
- ii) The Applicant's commitment to land purchases demonstrates its desire to provide genuine protection and buffers around its mining operation.
- iii) The Applicant has already demonstrated its commitment to a high standard of rehabilitation through its tree planting program on a number of properties purchased within the proposed buffer around the Mine Area and elsewhere (see **Plates 2.3 to 2.6**). The Applicant has achieved a level of tree growth far in excess of any private, Council or industry group in the local area principally due to its commitment to high quality ground preparation standards, i.e. standards that would be adopted over the life of the amended Project.
- iv) The Applicant has placed considerable emphasis upon ensuring the agricultural productivity and productive value of the land it has purchased is not diminished during its tenure of ownership, including during the period until mining commences, i.e. in the event of all necessary approvals being obtained. In recognition of its commitment to the ongoing productive use of the land, the Applicant has also entered into an agreement with the operators of the adjacent Speldon Dairy to enable the extension of their operations onto an additional area of approximately 1 130ha of the Applicant's land.
- v) The Applicant has already committed to becoming a valued corporate citizen within the Gloucester Community. Since the commencement of its exploration activities in 2010, the Applicant has supported a wide range of community events,

programs and individuals both financially and in kind. The Applicant has, for example, provided the facility for the Gloucester Men's Shed adjacent to Fairbairns Road, which is regularly used by local men.

- vi) The Applicant has already committed to a Community Grants Program which would provide both direct and indirect benefits to the local community over the life of the amended Project (see Section 4.17.5). Supporting the local community in this manner reflects the Applicant's recognition of the importance of the local community.
- vii) The Applicant is supportive of working with the Gloucester Aero Club Inc. to provide a long-term airstrip on the Company's land for the benefit of all current and future aviation enthusiasts and related groups.
- viii) The Applicant remains committed to the range of improvements to upgrade the road network in the vicinity of the Mine Area that were proposed for the 2013 Project. The Applicant recognises the proposed improvements would not only benefit the traffic travelling to and from the Mine Area, but all motorists on that road network both during and beyond the life of the amended Project.
- ix) The Applicant has set a target of 75% of locally resident employees by the end of Year 3 of operations. By encouraging employees to live locally, the Applicant would encourage a diverse and stable social base for the community and help to address the dependency ratio and the implications of an ageing population in Gloucester.

6.1.4 Ecologically Sustainable Development

6.1.4.1 Introduction

Sustainable practices by industry, all levels of government and the community are recognised to be important for the future prosperity and well-being of NSW, Australia and the world. The principles of ESD that have been recognised for almost two decades are based upon meeting the needs of the current generation while conserving our ecosystems for the benefit of future generations. In order to achieve sustainable development, recognition needs to be placed upon the integration of equitable short-term and long-term environmental, economic and social objectives.

Throughout the design of the amended Project, the Applicant has endeavoured to address each of the sustainable development principles. The following subsections draw together the features of the amended Project that reflect the four principles of sustainable development, namely:

- the precautionary principle;
- the principle of social equity;
- the principle of the conservation of biodiversity and ecological integrity; and
- the principle for the improved valuation and pricing of environmental resources.

6.1.4.2 The Precautionary Principle

In order to satisfy this principle of ESD, emphasis needs to be placed on anticipation and prevention of environmental damage, rather than reacting to it. During the planning phase for the amended Project, and throughout the preparation of the EIS, the Applicant engaged specialist consultants to collect baseline environmental data to provide an appropriate level of understanding of the existing environment so as to reduce potential uncertainties in the design of the amended Project and any subsequent assessment. Examples of data collected are as follows.

- Meteorological monitoring commenced in June 2010 and continues.
- Background noise monitoring was undertaken over four periods with emphasis placed on those times of year when low background levels would typically occur.
- Baseline surface water quality monitoring commenced during July 2010 and continues.
- Baseline groundwater quality and level monitoring commenced during March 2011 and continues.
- Baseline air quality monitoring (deposited dust, PM₁₀ and PM_{2.5}) commenced during July 2010 and continues.
- Baseline aquatic ecology (groundwater – stygofauna) monitoring was undertaken between April and May 2011.

The team of specialist consultants examined the relevant baseline data collected, collated environmental data from other available sources and utilised all relevant information to predict the nature, magnitude and duration of potential impacts and recommend controls, safeguards and/or mitigation measures in order to ensure that the level of impact satisfies statutory requirements or reasonable community expectations.

This approach demonstrates that, throughout the development of the amended Project, the Applicant and its consultants have, by undertaking an appropriate level of research and baseline investigations and environmental evaluation, adopted an anticipatory approach to impacts, particularly those potentially resulting in irreversible ecological damage. The controls, safeguards and/or mitigation measures have therefore been planned with a comprehensive knowledge of the existing environment and the potential risk of environmental degradation posed by the amended Project.

The implementation of the environmental safeguards, controls and mitigation measures has been formalised by the Applicant in the Summary of Environmental Management and Monitoring Measures presented as Section 5.

Examples of matters relating to the precautionary principle that were considered during the design of the amended Project are outlined as follows.

Identification of Amended Project Objectives

The amended Project has been designed with the principal objective of developing and operating the mine in a safe and environmentally responsible manner which meets the requirements of local and State government agencies, accepted industry standards and

reasonable community expectations, and, to the extent practicable, within improved outcomes from those identified for the 2013 Project. The Applicant recognises that only through comprehensive environmental assessment, consideration of feasible alternatives mitigation measures and an environmentally responsible approach to the design and operation of the amended Project, can the risk of harm to the environment be minimised.

Design Components

in recognition of the Precautionary Principle, a number of design features were incorporated into the amended Project during the initial design stage. In addition, subsequent modifications were made in response to issues identified during the specialist consultants' investigations undertaken as part of the environmental assessment phase, as a result of the consultation program and to address submissions received relating to the 2013 Project. Examples of the design features and modifications included the following.

- The agreement reached with Yancoal which provides for Rocky Hill sized ROM coal to be processed at the CHPP at the Stratford Mining Complex and use of the Stratford rail loop to transport product coal to the Port of Newcastle. This has removed the requirement for duplication of suitable infrastructure already in existence locally, i.e. need for the construction of a separate CHPP and rail load-out facility for the Rocky Hill Coal Mine. The utilisation of existing processing infrastructure, reduces the potential for environmental impacts and consolidates the processing and management of coarse and fine rejects to an area in which these activities already occur.
- The use of a private haul road would significantly reduce the potential impacts on the surrounding road network and users, reduce noise emissions and reduce potential visual impacts.
- Defining a Site footprint to avoid impacting upon the surrounding creek and water system, namely the Avon River and Waukivory Creek while at the same time designing the mine components to both protect the Mine Area and not adversely impact the surrounding land in times of flooding.
- The amended Project includes the establishment of a biodiversity offset to maintain biodiversity values.
- The amended Project has been designed to include the progressive construction of a series of amenity barriers to mitigate both visual and noise impacts upon surrounding residents.
- The amended Project no longer proposes night-time operations. Consequently, the potential for noise, lighting and air quality impacts upon the surrounding community is greatly reduced.

Integration of Safeguards and Procedures

The framework for ongoing environmental management, operational performance and rehabilitation of the Site would be provided through compliance with the development consent and mining leases and be managed in accordance with approved management plans, each of which would involve input from relevant State and other government agencies. The Mining Operations Plan, which would contain a range of site specific environmental procedures to

achieve consistency with specified outcomes and to control identified risks, would be reviewed periodically, while the Annual Reviews would report on the progress of the operation and provide an opportunity for the regulators and community to review the effectiveness of the environmental management strategies adopted. Finally, the following management and operational safeguards would be implemented in accordance with the precautionary principle.

- All on-site procedures would be regularly reviewed, particularly in light of monitoring results, to ensure that management measures remain applicable / effective.
- Surface water, groundwater (quantity, quality, geomorphic stability), noise and vibration and particulate levels (deposited dust, PM₁₀, PM_{2.5}), terrestrial and aquatic ecology would be monitored at locations potentially most affected by the amended Project in order to ensure the continued compliance with the goals and/or predictions outlined in the EIS and approved management plans.
- Wherever possible, areas not required for mining-related activities in the short term would remain undisturbed to assist in minimising erosion and maintaining the agricultural productivity of the Site.
- Topsoil and subsoil would be stripped, stockpiled and re-spread on the basis of the quality of the soil (as indicated by the soil mapping) and planned final land use of different areas of the final landform.
- The final void would be backfilled with overburden above the predicted equilibrium water level following the cessation of mining in order to avoid leaving an open void or pit and a potentially saline water body.
- Payment of a road maintenance contribution to Mid-Coast Council reflecting the project-related traffic volumes generated on Jacks Road and Waukivory Road and The Bucketts Way.
- Roadside tree planting along The Bucketts Way, Fairbairns Road and Waukivory Road was undertaken in between 2012 and 2013 to aid in visual screening and improvement of visual amenity. The early planting of these tree screens has allowed substantial growth (see **Plates 2.3 to 2.6**) to occur prior to any commencement of mining activity. Further plantings would be undertaken on other privately-owned land with the agreement of the landowners.
- Induction procedures would inform employees and contractors of their personal responsibility, and that of the Company, to ensure preventative procedures are followed for management of all aspects of the environment, including noise, dust, water, threatened fauna or flora, unknown sites of Aboriginal cultural heritage and for consideration of the amenity of nearby residences, e.g. through a Driver's Code of Conduct.

Rehabilitation and Subsequent Land Use

Long-term adverse impacts on the local environment would be avoided through the design and rehabilitation of disturbed areas to a landform and land use equivalent or better than that of the pre-mining environment.

The Applicant has also reached a lease agreement with the neighbouring Speldon Partnership to utilise land within and adjacent to the Mine Area not used for mining or mining-related activities for grazing and fodder production purposes. This agreement has effectively increased the land available to the dairy by approximately 1 130ha. The dairy had historically milked around 500 cows but that number has now increased to around 680 milking cows since the leasing of the additional land. With continued land improvement initiatives undertaken by the Speldon Partnership, including pasture improvement, soil topdressing and more defined grazing management strategies, productivity will continue to increase. This, in turn, will have flow-on effects in terms of increased direct and indirect employment provided by them and indirect purchases, etc. for supply for their agricultural enterprises. To date, employment at the dairy has increased by an additional two full time and five part time employees. Notably, this agreement has been reached prior to and without certainty of approval of the amended Project resulting in tangible benefits to the local agricultural industry and community prior to any economic returns to the Applicant.

Conclusion

The precautionary principle has been considered during all stages of the design and assessment of the amended Project. The approach adopted, i.e. risk assessment, collection of baseline environmental data, initial assessment, consultation, specialist assessment and safeguard design provides a high degree of certainty that the amended Project would not result in any major unforeseen impacts. Where appropriate, actions have also been taken prior to receipt of development consent to provide ongoing and improved outcomes for the environment and local economy.

6.1.4.3 Social Equity

Social equity embraces value concepts of justice and fairness so that the basic needs of all sectors of society are met and there is a fair distribution of costs and benefits to the community. Social equity includes both inter-generational (between generations) and intra-generational (within generations) equity considerations.

Equity within generations requires that the economic and social benefits of the development be distributed appropriately among all members of the community. Equity between generations requires that the non-material well-being or “quality of life” of existing and future residents of the local community would be maintained over and beyond the life of the mine.

Both elements of social equity have been addressed through the design of the amended Project itself, the implementation of operational safeguards to mitigate any short-term or long-term environmental impacts and the proposed rehabilitation of the areas directly disturbed. Examples of matters relating to social equity that are relevant to the various stages of the amended Project are listed below.

Identification of Amended Project Objectives

In terms of social equity, the amended Project has been designed with the objective of maximising the social and economic benefits to the local and regional community whilst minimising both short-term and long-term environmental impacts, including social impacts. The amended Project has also been designed with the objective of ensuring the continued

viability of surrounding land uses and the provision of improved or replacement infrastructure which would provide direct and indirect benefits to the community both during and beyond the life of the amended Project.

Design Components

The amended Project has been designed to maintain inter-generational equity, i.e. in recognition that mining is a relatively short-term land use, and to ensure components of the existing ecological, social and economic environment available to existing generations remain available and/or are improved for future generations. Examples of this approach are as follows.

- The location and design of the disturbance footprint has been designed to minimise disturbance upon native vegetation and sensitive fauna habitats.
- The amended Project has been designed to ensure that discharge of saline water to the surrounding environment is avoided and that if releases of water occur, it is only from the water treatment plant with pre-tested water quality that would not adversely impact the downstream environment.
- The Applicant intends to closely monitor water availability so that, in the event negligible or no water is required to be pumped from the Avon River or Waukivory Creek, this water can be made available for short term use (e.g. annually) to other landholders in the Avon River catchment.
- The amended Project includes a biodiversity offset strategy to not only maintain, but improve, biodiversity values for land adjacent to the proposed Site.
- The utilisation of areas of the Applicant's available land, not previously used for high productivity agriculture, by the Speldon Partnership to both significantly increase the available land for its agricultural activities and overall milk output of the dairy.
- The rehabilitation of the Site would involve re-establishment of agricultural lands to the same or better land capability as currently exists so as to provide for its use for agricultural purposes in to the future.
- Backfilling the final void with overburden above the predicted long-term groundwater level following the cessation of mining in order to avoid leaving a potentially saline water body within the final landform.
- The local/sub-arterial road network would be upgraded, including the replacement of the Jacks Road bridge, to benefit existing and future generations at no financial cost to Council/ratepayers.

Integration of Safeguards and Procedures

The Applicant recognises that all members of the local community and wider Gloucester district should benefit appropriately from the amended Project either directly or indirectly. In order to ensure a realistic distribution of benefits, the Applicant has proposed the establishment of a Community Grants Program – designed to provide both direct and indirect benefits to the local community during and beyond the life of the mine. The program includes an annual contribution at a rate of 50 cents per tonne of product sold generating approximately \$6.5

million over the life of the amended Project. In addition to the monetary contributions, the Applicant has committed to a range of contributions to education, training and local employment initiatives including:

- sponsorship of up to three tertiary education scholarships annually in fields such as mining, engineering, agriculture and environmental science, i.e. fields of study which would provide recipients with diverse career opportunities;
- provision of trade apprenticeships for local youth at the Rocky Hill Coal Mine;
- provision of competency training and certification on mining-related equipment to assist local men and women gain employment in mining or other related fields; and
- provision of local training and employment for local people through the Applicant's farming enterprises or farming enterprises on the Applicant's land.

The economic assessment of the amended Project has concluded that the benefits of the amended Project outweigh economic costs with the results of a Cost Benefit Analysis estimating a net benefit to the NSW community of \$89.5 million over the life of the amended Project, valued in 2016 dollars (i.e. as a net present value). Actual financial payments made within NSW would be higher and would exceed \$200 million. The benefits to the local community include an average of 97 full time equivalent jobs and non-labour expenditure estimated at approximately \$65 million per annum over the life of the amended Project.

In addition, the Applicant has committed to salvage and appropriately store or relocate identified artefacts of Aboriginal origin in conjunction with the Registered Aboriginal Parties with connection to Worimi Country or their chosen representatives. Salvage of these items would ensure that these artefacts are available to future generations and the educational benefit (however limited) would remain to be available to the Aboriginal and broader community.

Progressive Rehabilitation and Subsequent Land Use

The final landform would be progressively constructed and rehabilitated in a manner that would return the land to the same or a better land capability as currently exists so as to ensure the suitability of the land for agricultural use for future generations.

Conclusion

The principle of social equity has been addressed throughout the design of the amended Project. The amended Project would result in substantial economic benefits as summarised in Section 4.18 and a range of social benefits to the local and wider community both now and into the future. The proposed safeguards and management measures and projects/programs funded by the Applicant would assist in ensuring the benefits of the amended Project for both existing and future generations.

The amended Project has also been designed such that elements of the existing environment available to this generation, including local biodiversity and agriculture, would continue to be available to future generations. Notwithstanding, the Applicant would continue to adopt a proactive approach in identifying and addressing any concerns identified by the local community.

6.1.4.4 Conservation of Biological Diversity and Ecological Integrity

The protection of biodiversity and maintenance of ecological processes and systems are central goals of sustainability. It is important that developments do not threaten the integrity of the ecological system as a whole or the conservation of threatened species in the short- or long-term. Details of how the amended Project has been designed to achieve compliance with these principles are set out below.

Identification of Amended Project Objectives

The Applicant is committed to undertaking all activities in an environmentally responsible manner, and recognises the need to ensure that changes to natural components of the environment do not significantly adversely affect biological diversity or ecological integrity. As such, the objectives of the amended Project with respect to biological diversity and ecological integrity are to:

- avoid, as far as practicable, impacts on threatened flora and fauna through the minimisation of disturbance footprint and the use of previously cleared land;
- mitigation of potential impacts on threatened fauna identified within the Site through measures to mitigate for the temporary loss of habitat that would be an unavoidable part of the amended Project;
- offset the residual impacts on threatened flora and fauna (and native vegetation and fauna habitats generally) through the development and implementation of a biodiversity offset strategy;
- maintain surface water and groundwater base flows within the Avon River and Waukivory and Oaky Creeks; and
- maintain and/or improve the soil resources on land owned by the Applicant.

Design Components

The amended Project has been designed to ensure that it would not threaten the integrity of the ecological system as a whole or the conservation of any threatened species in the short or long term. The key design components relating to the conservation of biological diversity and ecological integrity are as follows.

- The disturbance footprint has been designed to maximise disturbance in areas previously cleared for grazing activities, rather than areas of remnant native vegetation. In particular, the Applicant has planned to avoid clearing of the roadside vegetation corridor along the northern section of McKinleys Lane and has avoided those parts of the Site containing better quality terrestrial and riparian habitats.
- The rehabilitated landform would include areas returned to native woodland and specific native vegetation belts / fauna corridors together with scattered native vegetation plots throughout areas returned to agriculture. This would increase the biodiversity value and assist in integrating the rehabilitated land with existing native vegetation and fauna habitat areas, thereby maintaining and, in the longer term, improving the ecological integrity and connectivity of the rehabilitated landform and areas of remnant vegetation.

- The amended Project includes a biodiversity offset strategy to offset residual biodiversity impacts and to improve biodiversity values. This strategy, which includes specified management activities to improve biodiversity, revegetation of low condition areas and long-term protection of the nominated area, would also reduce or remove potential threats that would otherwise remain to that area, e.g. a continuation of grazing or weed proliferation.
- Water management structures have been designed and would be constructed to ensure that only water of appropriate quality leaves the Site and only in accordance with the Site's environment protection licence.
- Soil resources would be stripped and, when not able to be directly transferred to an area of the final landform, would be managed in stockpiles or on the amenity barriers for subsequent respreading over the final landform. The stockpiles would be designed and managed to minimise any reduction in the biological activity within the soils and prevent erosion and sedimentation from these structures.
- The construction of internal roads and access routes would, to the extent practicable, be confined to areas of planned disturbance so as to avoid unnecessary removal of native vegetation.
- The replacement of existing bridge over the Avon River at Jacks Road and an existing private crossing of Waukivory Creek would result in structures that improve in-stream ecology.

Integration of Safeguards and Procedures

The following safeguards and procedures have been integrated into the amended Project with the objective of maintaining or improving biological diversity and ecological integrity.

- Where practicable, vegetation clearing, particularly the removal of trees, would be scheduled for the late summer to autumn period in order to minimise potential impacts on fauna that might be nesting, roosting or otherwise utilising the areas scheduled for disturbance.
- Hollow-bearing trees that are removed would be retained and used to provide habitat for ground fauna in the fauna corridors or biodiversity offset area.
- A visual inspection of mature trees to be removed would be undertaken and any threatened fauna appropriately re-located. The inspection for fauna would be undertaken immediately prior to the clearing operations.
- Topsoil resources would be conserved and preferentially directly transferred onto rehabilitation areas to maximise the opportunity for germination of the natural seed stock, thereby maximising the natural regeneration and spatial diversity of locally occurring indigenous species on the final landform.
- Monitoring programs would be implemented to ensure any changes to identified populations of threatened fauna, aquatic ecology, surface water and groundwater are addressed and an adaptive management approach taken.

Progressive Rehabilitation and Subsequent Land Use

As noted above, the final landform and rehabilitation design for the Site would include areas returned to native woodland, with specific native vegetation belts / fauna corridors as well as areas returned to agriculture. Given that the remnant vegetation to be cleared for the amended Project primarily comprises individual trees or small isolated clumps, the proposed vegetation belts and woodland areas would increase habitat connectivity and habitat in general in the long term.

Conclusion

The amended Project appropriately addresses the principles of Conservation of Biological Diversity and Ecological Integrity through the avoidance of disturbance to native vegetation, where possible; mitigation of potential impacts to threatened fauna and re-establishment of areas of native vegetation and fauna corridors.

The proposed increase in the area currently available for nature conservation and protected in perpetuity, and ongoing management of biodiversity values within the Site (and the biodiversity offset area) through a Biodiversity Management Plan, would have long-term benefits for the ecology within and in the vicinity of the Site.

6.1.4.5 Improved Valuation and Pricing of Environmental Resources

The issues that form the basis of this principle relate to the acceptance that the “polluter pays”; all resources are appropriately valued; cost-effective environmental stewardship is adopted, and the adoption of user pays prices based upon the full life cycle of the costs. Examples of how the amended Project addresses this principle are set out below.

Identification of Amended Project Objectives

The Applicant’s principal objective of the amended Project is the design and operation of the mine in a manner that minimises surface disturbance and impact on the environment and surrounding residents. This objective demonstrates that an appropriate value has been placed on elements of the existing environment.

Design Components

The design of the amended Project incorporates a range of components that the Applicant is proposing to fund that ultimately demonstrate support of this principle. Examples of the funding proposed include the following.

- The Applicant will pay for the replacement of the Jacks Road bridge over the Avon River and the upgrade of sections of road and intersections, all of which would benefit not only the Applicant but the wider community.
- Annual payments would be made to Council for the maintenance of a range of public roads to be used by heavy vehicles travelling to and from Site. These payments would be commensurate with the level of use of the subject roads by Project-related heavy vehicles travelling to and from the Site.
- The Community Grants Program discussed in Section 6.1.3 is a further example of the Applicant’s commitment to investing part of the profits into the local community.

Integration of Safeguards and Procedures

The extent of research, planning and design of environmental safeguards and mitigation measures to prevent irreversible damage to environmental resources is evidence of the value placed by the Applicant on these resources.

Progressive Rehabilitation and Subsequent Land Use

The design of the final landform to replicate, as far as practical, the existing landform and the pre-mining agricultural production capability, as well as enhance the existing environment through establishment of open woodland and native vegetation belts / fauna corridors, exemplifies the value placed by the Applicant on the existing environment of the Site.

Conclusion

It is considered that the price of the coking coal sold would be sufficient to enable the Applicant to undertake all environmentally-related tasks and meet any commitments made to the local community.

6.1.4.6 Conclusion

The approach taken in planning for this amended Project has been multi-disciplinary, and involved consultation with the broad spectrum of the community and various government agencies. The emphasis has been on the application of appropriate safeguards to minimise potential environmental, social and economic impacts. The design of the amended Project has addressed each of the sustainable development principles and, on balance, it is concluded that the amended Project achieves a sustainable outcome for the local and wider environment.

6.1.5 Planning Considerations

This subsection reviews the compliance of the amended Project with State planning instruments, regional strategies and the Gloucester LEP 2010.

6.1.5.1 State Planning Issues

State Environmental Planning Policy (State and Regional Development) 2011

Being a coal mine, the amended Project is identified under Schedule 1 of the SEPP as a State significant development to which Part 4 Division 4.1 of the EP&A Act 1979 applies. This EIS addresses the requirements of this SEPP.

State Environmental Planning Policy (Mining, Petroleum Production and Extractive Industries) 2007

The Mining SEPP specifies matters requiring consideration in the assessment of any mining, petroleum production and extractive industry development, as defined in NSW legislation. **Table 3.2** presents a summary of each element requiring consideration and a reference to the section in the EIS where each is addressed.

State Environmental Planning Policy (Infrastructure) 2007

A range of infrastructure has been identified which would be affected by the amended Project including electricity and road infrastructure. The Applicant has consulted with the relevant stakeholders including TransGrid, Essential Energy and the former Gloucester Shire Council and considered their requirements in the preparation of the EIS.

State Environmental Planning Policy No. 33 – Hazardous and Offensive Development (SEPP 33)

Based on the risk screening method of *Applying SEPP 33 Final* (DP&I, 2011), neither the storage nor transport of the hazardous materials to be used on the Site would result in the amended Project being considered hazardous, offensive or potentially hazardous under SEPP 33 (see **Appendix 5**).

State Environmental Planning Policy No. 44 – Koala Habitat Protection (SEPP 44)

SEPP 44 has been addressed by Biosis (2016). The Site contains three of the listed Koala feed trees within isolated areas of remnant vegetation. These areas of remnant vegetation represent less than 5% of the Site and are classified as “Potential Koala Habitat”. No core Koala habitat was identified.

6.1.5.2 Regional Planning Issues**Strategic Regional Plan Use Plan – Upper Hunter**

The Strategic Regional Plan Use Plan – Upper Hunter (SRLUP) requires any State significant development proposal that received Director-General’s Requirements before the implementation of the SRLUP to be assessed under the transitional arrangements. Falling into this category, the amended Project is required to submit an Agricultural Impact Statement (AIS) with the application for development consent, and to be assessed against Aquifer Interference Policy. Therefore, in accordance with the transitional arrangements of the SRLUP, a copy of the AIS is presented within Volume 5 Part 13 of the *Specialist Consultant Studies Compendium*.

Hunter Regional Environmental Plan – Heritage

This document does not contain any listed items relevant to the amended Project.

Hunter-Central Rivers Draft Catchment Action Plan 2013-2023

The Catchment Action Plan is a whole of government and community strategic plan that aims to capture the full range of issues, roles and responsibilities of all the key organisations (and stakeholders such as the Applicant) involved in natural resource management and decision making.

Table 3.3 lists the relevant goals from the Catchment Action Plan and a commentary on how the Applicant would address those goals.

6.1.5.3 Local Planning Issues

In recognition that a proportion of the Site is located within land zoned E3 – Environmental Management as identified in the Gloucester LEP 2010 (see **Figure 3.4**), the Applicant has, to the extent practicable, endeavoured to design the amended Project to satisfy the objectives of the zone which relate to:

- i) protecting, managing and restoring areas with special ecological, scientific, cultural and aesthetic values;
- ii) providing a limited range of development that does not adversely affect those values; and
- iii) conserving the biological diversity and native vegetation corridors and scenic qualities in a rural setting.

The objectives have been achieved through the following.

- i) Use of vegetated amenity barriers to ensure views towards the Mograni Range are not compromised during the life of the amended Project and that any impacts to the area's aesthetics value during the construction and operation of the amended Project would be short term. On the whole, visibility of the mining-related activities within the Site would be limited by topography, settlement pattern, the location of roads, and by other intervening landscape and vegetation features.
- ii) The design of a final landform that emulates the form and character of the existing landform, with ridges and watercourses in similar locations to those present prior to mining.
- iii) Backfilling the void remaining following the completion of coal extraction at the northern end of the Main Pit to re-instate LSC Class 4 grazing land, a feature that would have positive impacts on aesthetic values of the subject land.
- iv) The creation of a 267ha Biodiversity Offset Area, together with vegetated fauna corridors and nearby native vegetation plantings on the final landform, which would assist to enhance the biodiversity and native vegetation corridors on the western side of the Mograni Range.

The amended Project would have a short term adverse effect on the environmental values of the land within the E3 Zone. However, use of amenity barriers and the progressive rehabilitation and re-establishment of a comparable landform in a relatively short period of time would re-instate those values for future generations.

Overall, the amended Project is considered to satisfy the E3 Environmental Management Zone objectives since the design of the amended Project and the proposed management and mitigation measures would be implemented, where practicable, to minimise the potential impacts of the key attributes of the zone, i.e. with respect to ecological and aesthetic values of the area.

The southern section of the Mine Area and the private haul road are located within the RU1 Primary Production Zone. The implementation of the proposed management and mitigations measures would ensure the objectives of the RU1 Zone are satisfied as much as possible over the life of the amended Project. Once rehabilitated, the Site would fully satisfy the zone objectives, particularly through the improved primary production over much of the Applicant's land.

6.1.6 Key Amendments Addressing Environmental Issues

6.1.6.1 Introduction

As part of the planning and assessment process for the amended Project, the Applicant has considered the issues and concerns raised in relation to the 2013 Project. As a consequence of this review, the Applicant has made a number of changes to the 2013 Project which have collectively contributed to an amended Project that would have an overall reduced level environmental impact whilst maintaining positive social and economic benefits.

One of the key concerns with the 2013 Project was the proximity of the mine to Gloucester. Whilst it has not been possible to change the location of the open cut pits, the amended Project would operate with much less infrastructure in that the previously proposed CHPP, overland conveyor, rail loop and rail load-out facility would not be constructed and used, thereby reducing the area of impact of the total project on the surrounding community. The reliance upon the CHPP at the nearby Stratford Mining Complex and the rail load-out facility at that site would noticeably reduce impacts of the amended Project, particularly for those residents on the southern side of the Forbesdale Estate and a number of the rural and rural-residential properties adjacent to The Bucketts Way south of Fairbairns Road.

Apart from reducing the area of potential disturbance, the Applicant has re-designed a range of components to improve the environmental performance and further reduce adverse impacts. The key re-designed features have been the western and northern amenity barrier and the open cut pits themselves. This subsection reviews the amendments made to the 2013 Project and highlights the improved environmental outcomes, where applicable. A detailed record of the key differences between the 2013 Project and the amended Project for each environmental component is presented in **Appendix 1**.

6.1.6.2 Noise and Blasting

The localised increased elevation of the western and northern amenity barrier to provide a more varied and natural appearance and greater noise protection, together with the revised internal layout of the open cut pits, has been effective by appreciably reducing predicted intrusive noise levels at the residences in the vicinity of the Mine Area. **Table 6.1** summarises the number and locations of residences that were assessed in the Noise Management Zone and Noise Affectionation Zone for the 2013 Project and the amended Project.

Table 6.1
Comparison of Residences within the Noise Management and Affectionation Zones

| | 2013 Project | | | Amended Project | | |
|------------|----------------------------------|---------------------------|-----------------------|--|---------------------------|-----------------------|
| | Noise Management Zone | | Affectionation | Noise Management Zone | | Affectionation |
| | 1 to 2dB(A) above PSNL | 3 to 5dB(A) above PSNL | >5dB(A) above PSNL | 1 to 2dB(A) above PSNL | 3 to 5dB(A) above PSNL | >5dB(A) above PSNL |
| Daytime | 7, 18, 19A, 23, 56, 154, 193 | 18, 19A, 23 | 6, 23 | 6, 19A | - | nil |
| Evening | 7, 154, 163A, 183, 184B | 6, 18, 19A, 23, 56A, | nil | 7 | 6 | nil |
| Night-time | 7, 154, 163A, 163B, 184B, 193 | 23, 183, 1874B | 6, 18, 56A | Not Applicable (no night-time operations) | | |

Whilst there would be a substantial reduction in the number of residences within the noise management zone, i.e. from 10 to 3, the intrusive noise levels experienced at the residences within the vicinity of the Mine Area would also be reduced. **Table 6.2** provides a comparison of intrusive noise levels between the 2013 Project and the amended Project at five representative residences around the Mine Area, during both the daytime and evening.

**Table 6.2
Comparative Intrusive Noise Levels for Representative Residences (dB(A))**

| Residence (see Figure 4.7) | Period | 2013 Project ^{1 (2,3)} | | | | Amended Project ⁴ | | | |
|-------------------------------|---------|---------------------------------|-------------|-------------|-------------|------------------------------|--------|--------|---------|
| | | Year 2.5 | Year 4.25 | Year 7.75 | Year 13 | Year 3 | Year 4 | Year 7 | Year 10 |
| 56A (Forbesdale Estate) | Daytime | 32 (33, 37) | 33 (34, 34) | 34 (36, 35) | 32 (34, 33) | 30 | 30 | 30 | 29 |
| | Evening | 34 (35, 38) | 36 (37, 37) | 34 (36, 35) | 33 (35, 35) | - | 23 | 25 | 20 |
| 154 (Forbesdale Estate) | Daytime | 31 (32, 31) | 33 (33, 34) | 34 (34, 34) | 31 (32, 32) | 27 | 28 | 28 | 26 |
| | Evening | 32 (32, 32) | 33 (34, 34) | 32 (33, 33) | 34 (34, 34) | - | 32 | 30 | 26 |
| 126 (The Bucketts Way) | Daytime | 30 (30, 30) | 32 (32, 32) | 31 (31, 31) | 30 (30, 30) | 20 | 24 | 25 | 21 |
| | Evening | 31 (31, 31) | 33 (33, 33) | 29 (29, 29) | 31 (31, 31) | - | 33 | 31 | 29 |
| 36 (Jacks Road) | Daytime | 33 (33, 33) | 34 (34, 34) | 32 (33, 33) | 29 (29, 29) | 20 | 25 | 26 | 20 |
| | Evening | 33 (33, 33) | 34 (34, 34) | 27 (28, 28) | 28 (28, 28) | - | 35 | 35 | 34 |
| 23 (Other rural) | Daytime | 39 (39, 39) | 45 (45, 45) | 37 (37, 37) | 33 (34, 34) | 23 | 26 | 32 | 21 |
| | Evening | 38 (38, 38) | 33 (33, 33) | 31 (31, 31) | 32 (32, 32) | - | 32 | 31 | 22 |

Note 1: 2013 Project Mine Area predicted intrusive noise (10th percentile exceedance level).
 Note 2: 2013 Project Mine Area and Conveyor predicted intrusive noise (10th percentile exceedance level).
 Note 3: 2013 Project Mine Area and Rail Load-out Facility predicted intrusive noise (10th percentile exceedance level).
 Note 4: Amended Project Mine Area predicted intrusive noise level in accordance with the NSW INP.

Overall, the amended Project would result in generally lower intrusive noise levels by comparison with the 2013 Project which would, in turn, reduce the number of people who would be able to discern any mine-related noise. Predicted intrusive noise levels from the Amended Project during noise enhancing southerly winds at residences located off Jacks Road would be generally equivalent to those predicted for the 2013 Project.

6.1.6.3 Air Quality and Health

As a result of the reduced area and intensity of the activities proposed under the amended Project, including the removal of night-time operations, the predicted concentration of particulates at surrounding private residences and sensitive receivers has decreased compared to those for the 2013 Project. In particular, it is predicted that the amended Project would result in no exceedances of the relevant annual criteria at all privately-owned properties for TSP, PM₁₀, PM_{2.5} and deposited dust and no exceedance of the maximum 24 hour average PM₁₀ and PM_{2.5} from the amended Project alone. In comparison, maximum 24 hour average PM₁₀ exceedances were predicted for two surrounding privately-owned residences for the 2013 Project.

Whilst these exceedances are no longer predicted, the Applicant remains committed to best practice management, including utilisation of a meteorological forecasting system and real-time air quality monitoring to enable proactive management and further reduce the risk of an exceedance.

It is noted that the Air Quality and Health Risk Assessments completed for the amended Project also provide additional analysis of both particular matter and nitrogen dioxide (NO₂), not originally included within the 2013 Project assessments. The comprehensive assessments provide further support to the improved air quality outcomes of the amended Project.

A comparison of the greenhouse gas generation for the 2013 and amended Projects has established the following.

1. Scope 1 emissions would be comparable.
2. Scope 2 emissions would be higher for the amended Project due to the increased electrical power usage for the water treatment plant.
3. Scope 3 emissions would be lower for the amended Project.

From a health-risk perspective, the assessment for the 2013 Project considered project-only emission concentrations whilst the assessment for the amended Project has more conservatively considered the cumulative emission concentrations. Both assessments concluded that the predicted increase in base incidences are sufficiently small as to be no cause for concern. Whilst the changes in health risk are not directly comparable between the assessments, given the reductions in project-only particulate emissions, the overall health risk is likely to have similarly reduced.

6.1.6.4 Visibility

The key differences (and improvements) between the 2013 Project and the amended Project are as follows.

1. The area of disturbance and activities within 2km of a number of residences and a section of the Bucketts Way (focussing on the southern side of the Forbesdale Estate and the vicinity of the former rail load-out facility) has been reduced, principally through the removal of the CHPP, overland conveyor, rail loop and rail load-out facility.
2. The western and northern amenity barrier would be higher in areas and with less steep and more visually diverse slopes, with dense areas of trees and a more varied and natural upper surface. The higher sections of the barrier would visually shield a greater component within the Mine Area from the rural-residential estates to the west through to the north and provide a more natural appearance than the barrier included in the 2013 Project.
3. The structures to contain coal would be smaller, i.e. a 28m high bin for the 2013 Project (0.6km from The Bucketts Way) as opposed to a 23m high bin for the amended Project (4.5km from The Bucketts Way).
4. There would be noticeably less light sources as there would be no night-time mining activities, with the absence of the overland conveyor, arriving and departing trains, and the rail load-out facility similarly removing light sources from those areas.

It is noted that there would be no change to the Applicant's commitment to backfill the final void and create a long term visually indistinguishable final landform feature in the local area.

6.1.6.5 Groundwater Resources

The groundwater modelling has established that there would be an increased level of saline Permian groundwater inflows to the open cut pits over the life of the amended Project. Similarly, there would be a greater net reduction in flow to groundwater within the nearby alluvium. These changes are attributed to the additional 2 years that the open cut pits would be operational and the slightly deeper coal extraction (i.e. approximately 220m -v- 190m).

The overall impact of the changes in groundwater inflows would be minor, principally because the saline water is in fact not used in the vicinity of the Mine Area and the overall impact on stream flows in the Avon River would be negligible. AGE (2016) calculated that the overall average daily reduction in groundwater flow to the alluvium would amount to less than 2.6% of the median base flow component of the Avon River, i.e. a level comparable with the 2013 Project.

6.1.6.6 Surface Water Resources

The management of surface water within the Mine Area would continue to be based upon the segregation of clean water, sediment-laden water and saline water. The key difference between the 2013 Project and the amended Project would be the need to introduce a water treatment plant to treat the quantities of saline water in excess of available storage capacity arising from:

- i) increased saline groundwater inflows; and
- ii) reduced usage within the absence the previously proposed CHPP.

The treatment of up to 2.5ML/day of saline water would enable this quantity of treated water to be irrigated on site and on the adjoining land to improve the productivity of pasture and fodder crops on the Applicant's landholding, including the Speldon Partnership Dairy.

There would be little change in the stream flows within the Avon River between the 2013 and amended Projects as a result of the retention of surface water within the Mine Area. The removal of in excess of 32 800 tonnes of salt from the groundwater system over the life of the amended Project (which ultimately reports to the nearby watercourses) would result in short-term improvements in water quality in the alluvial groundwater. However, in the longer term, there would be negligible changes on downstream water quality.

6.1.6.7 Traffic and Transportation

The volume of traffic on local roads was a common concern raised in relation to the 2013 Project. With the removal of night-time operations and associated smaller workforce and production rates, the amended Project would result in fewer traffic movements. Despite these reductions in traffic movements, the same road upgrades proposed as part of the 2013 Project are still proposed under the amended Project.

During the site establishment and construction stage, light and heavy vehicles associated with the construction of the private haul road would access the private haul road via Wenham Cox Road or Fairbairns Road. Once operational, the use of the private haul road for the delivery of earthmoving equipment, etc. would reduce the number of heavy vehicles travelling to the Mine Area via Jacks Road.

6.1.6.8 Management of Rejects

As part of the 2013 Project it was proposed that ROM coal would be processed on site. Coarse and fine rejects from the CHPP were to be blended and emplaced with the overburden. A total of 6.9Mt of coarse and fine reject material would have been produced equating to 2.2% of the overburden by weight.

The amended Project proposes only to size coal on site with further processing to be undertaken at the CHPP within the Stratford Mining Complex. The sizing of coal would still generate breaker rejects, principally comprising stone from the coal seam roof and floor and interbedded stone bands typically >120mm in size. A total of 2.1Mt of breaker reject material would be produced, equating to 0.7% of the overburden by weight.

The amended Project would therefore result in a more favourable rejects to overburden ratio enabling more effective management of any breaker reject materials. Additionally, as discussed in Section 2.3.3.3, the proportion of breaker rejects that are considered potentially acid forming would be lower than the fine and coarse reject given that the materials containing pyrite would tend to pass through the breaker station into the ROM coal transported to the Stratford CHPP. Additionally, as the surface area subject to potential oxidation is substantially less for the larger breaker reject particles, the potential reactivity would also be substantially less than coarse and fine reject generated by the previously proposed CHPP.

Therefore, the potential for environmental issues arising from acid generation within the Mine Area are reduced for the amended Project. Additionally, reject material generated at the Stratford CHPP would be managed at the Stratford Mining Complex within existing voids where the materials are best managed. Therefore, the amended Project consolidates the management of coarse and fine rejects to an area in which these activities already occur and are appropriately managed.

6.1.6.9 Social

The amended Project would maintain the balance of social risks and social benefits proposed for the 2013 Project. Research completed by Key Insights (2016) identified that while concerns remain within some sections of the community regarding potential environmental and amenity impacts, there is also a desire to see a diverse and stable economic base maintained in the Gloucester area. A range of amendments have been made to the amended Project following consideration of community feedback, in particular the decision to reduce operating hours. Important measures that would mitigate short and long term social risks that were proposed for the 2013 Project have been retained for the amended Project including the proposed implementation of a Community Grants Program, the commitment to backfill the final void during rehabilitation and the proposed Biodiversity Offset Area that would secure biodiversity values for existing and future generations. The Applicant has maintained its objective to provide social benefits for the Gloucester community through a target that by the end of Year 3 of operations, 75% of employees are living locally. This would encourage a diverse and stable social base for the community.

6.1.6.10 Economic

The economic impacts of the amended Project have been assessed in terms of net present value which discounts a future benefit or cost so that the value may be assessed in present terms (i.e. 2016 dollars). A Cost Benefit Analysis has estimated the net benefits and costs to the NSW community resulting from the amended Project and determined that a net benefit of approximately \$89.5 million, presented as net present value, would be expected. Actual financial payments made within NSW (i.e. where values have not been discounted to present the value in 2016 dollars) over the life of the amended Project would exceed \$200 million. The net benefit to NSW was established through comparison with a base case that assumes continued agricultural use of the Site.

Benefits and costs to the local community were assessed through a Local Effects Analysis which concluded that local benefits would include the provision of an average of 97 full time equivalent jobs during operations, associated wage payments of approximately \$9.0 million per year and average non-labour spending of approximately \$65 million per year, with approximately \$48 million of this expected to be spent locally.

It is anticipated that the amended Project will result in payment of approximately \$146 million (\$60 million NPV), in corporate taxes over the life of the amended Project. A share of this tax revenue to the nation would return to NSW and the local area through Federal funding of infrastructure, health and education services.

Environmental, social and transport effects occur at a national, State and local level, and have been estimated to represent a cost of approximately \$24 million (\$9.9 million NPV) at a national level over the life of the amended Project. The majority of external costs relate to greenhouse gas emissions estimated using projections of the Scope 1 and Scope 2 carbon emissions. Air quality and noise-related impacts would principally be borne by the local community with these costs estimated at an annual average of approximately \$20,000. Other external costs have been assessed to be negligible or difficult to quantify, but were not expected to exceed expected benefits.

In summary, the amended Project is estimated to deliver a net economic benefit for the NSW community and the benefits assessed at a local scale would far outweigh external costs associated with the assessed residual impacts.

6.1.7 The Importance of Producing High Quality Coking Coal

Development of the Rocky Hill Coal Project would enable the extraction of a high grade, predominantly coking (metallurgical) coal resource which exhibits some of the highest fluidity values in NSW and Australia.

Because of its quality and the increasing scarcity of the similar products in the Asian region, it is in high demand by Asian steel mills.

Additionally, the Rocky Hill Coal Project product coal has the capacity to be blended with low fluidity, low ash coals from elsewhere in NSW to enhance their coking properties, enabling them to be marketed as coking as opposed to pulverized coal injection (PCI) or semi-soft products increasing their value and the attendant economic benefits to NSW and Australia.

6.2 JUSTIFICATION OF THE AMENDED PROJECT

6.2.1 Introduction

In assessing whether the development and operation of the amended Project is justified, consideration has been given to a wide range of biophysical, social and economic factors, including the predicted residual impacts on the environment together with the potential benefits of the amended Project. This section also considers the planning considerations involved in the design of the amended Project, the principal changes and amendments from the 2013 Project which address the key environmental issues, and the consequences of the amended Project not proceeding. The overall justification recognises weightings placed upon both the negative and positive residual impacts identified within this document by some specialist consultants.

6.2.2 Biophysical Considerations

The principal residual biophysical impacts relating to the amended Project are summarised in the following subsections.

6.2.2.1 Noise and Blasting

The design of the amended Project and its operations has been substantially influenced by the need to mitigate noise levels from activities within the Mine Area. The Applicant and its consultants have identified the most appropriate and practical manner in which the amended Project can be developed and operated to achieve compliance with all relevant criteria at as many surrounding receivers as possible, particularly under the adverse meteorological conditions of an evening (SLR, 2016). Particular emphasis in daily operations would be placed upon the predictive meteorological forecasting and use of real-time monitoring as proactive and reactive management tools to control noise levels.

Whilst it is recognised there are a number of privately-owned residences in the three rural-residential estates and nearby properties within the vicinity of the Mine Area (i.e. within approximately 1.3km to 3km of the closest area of disturbance), the separation distances to these receivers and the proposed design and operational safeguards to be implemented would ensure that noise levels at all but three of these receivers are compliant with the relevant criteria. The noise assessment also confirmed that no exceedances of noise criteria would occur within Gloucester township. The exceedances at the three receivers (i.e. between 1dB(A) and 5dB(A)) principally relate to the period between Year 4 and Year 7. The Applicant is committed to proactively discussing noise-related matters with the owners/occupants of the three subject residences to ensure that the effects of these exceedances are avoided, minimised or appropriately mitigated. It is noted that compliance under circumstances involving adverse meteorological conditions would result in lower noise levels being experienced during other periods when those conditions are absent. Notwithstanding the predicted compliance, SLR (2016) notes that noise from the Mine Area would be audible at low levels from time to time at the residences within the rural-residential estates and potentially in the southern side of Gloucester township, some of which may experience some noise for the first time.

In summary, based upon the predicted noise levels, it has been assessed that the overall impact on the surrounding community would be acceptable. The adoption of both pro-active and reactive measures would provide a mechanism for the assessment and introduction of possible additional measures to ensure noise exceedances are avoided, as much as possible.

6.2.2.2 Groundwater Resources

The groundwater assessment (AGE, 2016) determined that the inflows from the Permian strata into the proposed open cut pits would average approximately 2ML/day with the highest inflow of approximately 3ML/day occurring in Year 7.

A net reduction in groundwater flow from the Permian strata to the alluvium of between 0.02ML/day and 0.53ML/day, would occur averaging 0.27ML/day. AGE (2016) notes that the majority of this groundwater would remain in the underlying Permian strata and is therefore predicted not be lost from the regional groundwater system. The Applicant already holds sufficient water access licences under the *Water Sharing Plan for the Lower North Coast Unregulated and Alluvial Water Sources 2009* to account for the reduction in flows within the alluvium. The predicted net reduction in groundwater flow would have a negligible impact upon baseflows in the Avon River. At the highest rate of inflow, AGE (2016) predicts the reduction would amount to less than 2.6% of the median flow in the Avon River.

The Applicant will need to acquire water access licences under the *Water Sharing Plan for the North Coast Fractured and Igneous Rock Groundwater Source* to account for the inflows of the groundwater from the Permian strata into the open cut pits. The Applicant has ascertained that the opportunity would exist to obtain the required water access licences/entitlements to account for the groundwater inflows from the Permian strata, primarily from other resource companies. The licences/entitlements to be acquired would be surplus to each company's requirements.

In addition, AGE (2016) determined that there would be minimal impacts on groundwater quality or access to available groundwater by surrounding users as a result of the amended Project. The Applicant would implement an extensive monitoring program to confirm the extent and quality of inflow into the open cut pits and the absence of impacts upon surroundings.

The groundwater level beneath the open cut pits would be re-instated within 10 years of the cessation of coal extraction. Likewise, the influence upon the groundwater level within the alluvium would diminish comparatively quickly and most likely within 5 years of the cessation of coal extraction.

6.2.2.3 Surface Water Resources

The surface water assessment (WRM, 2016) established that there would be limited residual impacts to surface water resources as the diversion of clean water around the Mine Area and the segregation and management of sediment-laden water and saline water would appropriately prevent any potential surface water pollution events under a range of rainfall scenarios. In order to verify the outcomes of the assessment, the Applicant would undertake an extensive monitoring program and, if necessary, undertake adaptive management to achieve the required outcomes.

The results of the site water balance for the amended Project have established that there would be insufficient storage capacity for saline water and surface water captured in the open cut pits during various stages of the amended Project. Hence, the Applicant proposes to install and operate a water treatment plant to treat the excess saline water from Year 4 onwards.

Water would be released from the sediment dams once the water quality is acceptable to assist in maintaining environmental flows downstream from the Mine Area. Water may occasionally be released to the Avon River from the water treatment plant in the event the water is unable to be used for irrigation purposes on site or on the adjoining land. Only water of a quality satisfying the limits in the Site's environment protection licence would be released from Site. It is noted that the quantities of water available on site would be more than sufficient for on-site dust suppression requirements.

Modelling studies by WRM (2016) established that reductions in surface water flows downstream from the Mine Area would be negligible, i.e. typically less than approximately 1.5% in the Avon River and 2.1% in Waukivory Creek.

Flood modelling has determined that a 1 in 100 AEP flood event would not significantly impact upon the amended Project's infrastructure nor would the presence of the western and northern amenity barrier significantly alter or affect the downstream characteristics of a flood, with no impacts expected on downstream developments or properties as a result of the amended Project.

6.2.2.4 Air Quality

Through detailed and conservative modelling the air quality assessment (Pacific Environment, 2016a) has predicted that no privately-owned residences or sensitive receivers would experience annual average TSP, PM₁₀, PM_{2.5} or dust deposition levels above the assessment criteria, either from the amended Project alone or cumulatively. It is also predicted that the Project alone maximum 24-hour average PM₁₀ and PM_{2.5} concentrations would remain well below the assessment criteria.

Statistical analyses using the Monte Carlo Simulation were also undertaken to assess the likely cumulative impacts (background, project sources and other sources) at five representative residences. These analyses predicts that the amended Project would result in less than one additional exceedance per year of the 24-hour PM₁₀ criteria at three residences during two modelled years and up to two additional exceedances per year of the 24-hour PM_{2.5} criteria at the five residences in all modelled years, i.e. exceedances over and above those that would occur due to background sources in the absence of the amended Project.

The generation of nitrogen dioxide (NO₂) from blast fume and diesel combustion was also modelled. The predicted maximum cumulative 1-hour and annual average NO₂ concentrations were below the applicable criteria at all representative residences during all modelled years.

A health risk assessment (Pacific Environment, 2016b) has also been completed utilising the predicted particulate, NO₂ and PM_{2.5} concentrations to assess the potential for short-term and long-term health effects, i.e. from the range of operations including diesel consumption. Overall, the assessment of health risk concluded that air emissions from the amended Project would present little likelihood of causing adverse health effects to exposed individuals in the vicinity of the Site or within the Gloucester township.

The current air quality monitoring program would be continued over the life of the amended Project. The Applicant would maintain the two existing real-time PM₁₀ / PM_{2.5} (TEOM) monitoring stations, i.e. north and south of the Mine Area and install a new station within the vicinity of Forbesdale Estate. The existing north TEOM is located within the vicinity of the Avon River Estate. The real-time monitoring would provide the Applicant with information on concentrations of PM₁₀ and PM_{2.5}, thereby permitting Site contributions to ambient concentrations to be calculated. Should concentrations in the vicinity of receivers be noted to be approaching trigger levels that would potentially result in an exceedance of any criterion, relevant and contributing on-site operations would be identified and the activity or activities appropriately reduced, modified or terminated until such time as the monitoring information verifies that the criterion would be not exceeded.

6.2.2.5 Traffic and Transportation

The transportation assessment (Constructive Solutions, 2016) identified that both with and without the proposed upgrading/improvement works, the principal intersections relating to the amended Project would operate well below peak capacity over the life of the amended Project. The proposed upgrades of the surrounding road network, including the Jacks Road/The Bucketts Way intersection upgrade, Jacks Road/Waukivory Road, Waukivory Road/McKinleys Lane intersection upgrade, the replacement of the Jacks Road bridge across the Avon River, and the widening of Jacks Road and Waukivory Road east of Jacks Road, together with the following measures, would more than adequately address the identified potential impacts on the surrounding road network.

- Preparation and implementation of Construction and Operational Traffic Management Plans. Emphasis would be placed in these documents upon a wide range of safety considerations.
- Implementation of a Driver's Code of Conduct for contractors and employees.
- Payment of a road maintenance contribution to Council reflecting heavy vehicle traffic generated on Waukivory Road and Jacks Road and upgrade works completed.
- Payment of an annual contribution for maintenance of The Bucketts Way with the contribution calculation method consistent with that in the Development Consent SSD 4966 for the Stratford Extension Project.

Overall, the traffic levels associated with the amended Project would be accommodated on the surrounding road network, and the improvements proposed, particularly the replacement of the Jacks Road bridge, would benefit the local community well beyond the life of the amended Project.

6.2.2.6 Visibility

The visual impact assessment (RLA, 2016a) identified that the Site is within an area recognised for its moderate to high quality scenery and that the early construction of the western and northern amenity barrier would be visible from some residences in the nearby estates and from isolated areas of The Bucketts Way. The plantings within the Applicant's land and on other

properties adjacent to The Bucketts Way have, however, already effectively reduced the extent of visual exposure from sections of that road. Whilst earthmoving equipment would be periodically visible during the construction of the barrier, all efforts would be undertaken to minimise their duration in exposed areas. Further, in order to limit visual impacts during construction of the barrier, emphasis would be placed on progressively revegetating completed areas when each 2ha area (approximately) of the landform is completed. With the completion of the construction and revegetation of the western and northern amenity barrier, there would be very limited visibility of the mining operations. The progressive construction and temporary revegetation of the interim amenity barriers in advance of activities to their east would shield any additional potential visual impacts in relation to work undertaken in those areas. There would be no operations visible from about Year 8 onwards as all activities would be confined to the open cut pits and the ROM pad.

Lamb (2016a) determined that, to the casual observer, the post-mining final landform would be indistinguishable from the surrounding landscape, although those persons familiar with the local area would recognise where the minor changes to the pre-mining landform have occurred. These changes relate principally to an increase in the landform elevation in the area of the permanent overburden emplacement, but with the retention of microtopography and drainage patterns consistent with the pre-mining landform. Overall, the amended Project would not have a significant detrimental impact on the overall moderate to high quality scenic resource within the Gloucester area.

6.2.3 Social and Economic Considerations

6.2.3.1 Social Considerations

The social issues identified with respect to the amended Project would invariably have both positive and negative impacts. The key issues and the respective positive and negative impacts are outlined as follows.

Health Impacts: Adverse impacts relating particularly to air quality, noise and mental health issues are a concern to some members of the Gloucester and district community. Comprehensive mitigation measures and the use of real-time monitoring would ensure air quality and noise remain acceptable at non-project-related residences/receivers. The uncertainty surrounding the amended Project has resulted in increased stress for some persons in the local community related to a perceived lack of control over potential changes in the local environment. The social impact assessment concluded that the Gloucester community has high social capital and would respond positively following a decision on the amended Project, whether this is approval or refusal. The amended Project would also result in positive mental health impacts for others in the community associated with employment opportunities and improved economic well-being, if the amended Project proceeds.

Social Infrastructure Capacity Impacts: While it is recognised that the majority of social infrastructure services including cultural, sporting and community groups would cope with the predicted increase in population as a result of the amended Project, social infrastructure limitations may be experienced by the Ambulance Service and local childcare services. The Ambulance Service is confident that evidence-based planning processes would ensure it is capable of meeting demand and emergency services would be considered within the Applicant’s Emergency Plan. Childcare services may need to expand to meet demand, however this is considered to be a business opportunity and within the capabilities of existing centres.

Community Sense of Place and Amenity Impacts: An adverse impact of concern to some within the community relates to the introduction of a second coal mine and a subsequent shift from Gloucester being “a town with a mine” to “a mining town”. Maintaining the amenity of the township through visibility management, the diversity of the local economy and the economic stimulus to the township arising from the amended Project will help alleviate these issues.

Social Cohesion Impacts: The former Gloucester LGA is an area of high social capital and divisions within the community caused by support or opposition for the amended Project, are predicted to subside following a decision on the amended Project. The risk of higher incomes from mining operations, in contrast to the existing relatively lower non-mining incomes throughout the LGA and Gloucester causing social disruption is acknowledged. It would be important that the broader community benefit from the amended Project through, for example, the Community Grants Program, ‘family-friendly’ shifts and rostering practices, continued support for community building activities such as the Gloucester Men’s Shed and encouragement and recognition by the Applicant of worker involvement in community organisations and events.

Housing Impacts: It is recognised that there would potentially be upward pressures on housing sales and rentals prices within the local area as a result of the amended Project, as well as subsequent impacts on those with low incomes or currently experiencing housing stress. Qualitative research indicates there is current capacity at the low end of the housing rental market. Nonetheless, the Applicant would work together with community groups to support initiatives to provide affordable housing for local people and new workers if warranted.

On balance, the Applicant considers that its commitment to develop and operate the Rocky Hill Coal Project in a responsible, professional and proactive manner would mitigate social risks and enhance the net social benefits across the community as a whole, both over the life of the amended Project and beyond.

6.2.3.2 Economic Considerations

The economic issues identified with respect to the amended Project would invariably have both positive and negative impacts, with the key issues with respect to these impacts outlined below.

Local/Regional, State and Commonwealth Revenue Impacts

The following positive economic impacts would arise from the amended Project at the local/regional, State and Commonwealth levels.

Local/Regional

- An average of approximately 42 full-time equivalent jobs would be generated during the site establishment and construction stage and an average of approximately 97 full-time equivalent jobs would be generated during operations. The workforce would be drawn from local and regional areas, other parts of NSW and possibly interstate.
- The Applicant has set a target rate of 75% local resident employment by the end of Year 3 of operations. Local direct employment at this rate would result in 32 local full-time equivalent people during the site establishment and construction stage and 73 local full-time equivalent people during operations. This would result in expected annual average wage payments of approximately \$9.0 million over the life of the amended Project.
- Spending on non-labour items such as petrol, tyres and a range of other services is estimated at \$31 million during the approximately 10 month site establishment and construction stage and \$65 million per year during ongoing operations. It is estimated that approximately 74% of this expenditure would occur locally.
- Payment of additional local government rates has been estimated at \$5.6 million (\$3.5 million NPV), over the life of the amended Project based on the rate information provided by the former Gloucester Shire Council for 2016-17 local rates for mining land. This represents an increase of 520% in rate payments for project-related land as a consequence of the differential rating policy when compared to existing rates over the same area.
- Contribution of approximately \$6.5 million to the local community as a result of a production related Community Grants Program, at an average of approximately \$400 000 per annum.
- Additional local expenditure based on employee disposable income, contributions to local road maintenance, a program for land acquisitions over the life of the amended Project and the local share of corporate tax payments that would be accessed by the local community through Federal funding of infrastructure, health and education services.
- Flow-on benefits to the local/regional economies from each of the above.

The economic impacts of costs associated with the amended Project that would occur at a local level principally include air quality impacts estimated at approximately \$20,000 per year and the local share (based on population) of greenhouse gas emissions estimated at approximately \$3,000 per year.

State

- Payment of approximately \$144 million (\$63 million NPV) to the NSW state government in royalties.
- An estimated \$47 million (\$19 million NPV) based on the NSW community share of corporate tax payment received through Federal funding of infrastructure, health and education services.
- Flow-on effects from each of the above.

Commonwealth

- Payment to the Commonwealth government of in excess of \$146 million (\$60 million NPV) in corporate taxation obligations over the life of the amended Project.

Economic impacts of costs relating to residual environmental, social and transport effects over the life of the amended Project have been quantified at an estimated \$24 million (\$9.9 million NPV) at a national level of which approximately a third would be attributable to the NSW community over the life of the amended Project (based on population share).

6.3 CONSEQUENCES OF NOT PROCEEDING WITH THE AMENDED PROJECT

The consequences of not proceeding with the amended Project include the following.

- i) The employment opportunities for the numerous Gloucester and district residents who have registered their interest with the Applicant would not eventuate, with a consequent reduction in spending in Gloucester and anxiety issues related to lost employment opportunities. Similarly, an opportunity for inward migration of mine and support workers and their families which would potentially improve the age demographic, encourage new businesses, improve the viability of existing businesses and result in a greater diversity in the local employment base and associated flow-ons, would be foregone.
- ii) Asian steel mills would not have access to a very high quality coking coal, an essential raw material in steel manufacture.
- iii) Direct expenditure totalling an estimated \$65 million per year, of which \$48 million is expected to occur in the local economy, and the estimated operating and capital costs would not eventuate. Similarly, the multiplier effects of those expenditures in the local areas and \$ in the NSW economy would not eventuate.

- iv) The additional rates revenue to the Mid-Coast Council estimated of approximately \$5.6 million (\$3.5 million NPV) over the life of the amended Project would not eventuate, nor would the benefits arising from the Community Grants Program, i.e. direct injection of an additional approximately \$6.5 million to the community through the production-related grant (at an average of approximately \$400 000 annually). In addition, the proposed scholarships, employment and skills training and development opportunities would not eventuate.
- v) The additional beneficial environmental and related outcomes from the amended Project would not eventuate, i.e. with respect to the serving in perpetuity of the Biodiversity Offset Area and the replacement of the Jacks Road bridge across the Avon River together with local road upgrades at no cost to ratepayers.
- vi) The agricultural productivity benefits that have already been recorded as a consequence of the agreement between the Applicant and the Speldon Partnership would be unlikely to continue.
- vii) The various temporary impacts predicted to occur as a result of the amended Project would not eventuate, albeit at levels considered acceptable, e.g. with respect to noise, air quality, visibility, groundwater and surface water.

Other likely outcomes from the no development option, based on the demographic projections for Gloucester, would include:

- a small and decreasing population growth;
- low levels of population growth-generated employment;
- a continued exodus of people in primary working years;
- an increase in the percentage of the population over 55 years of age and the ratio of people not working relying on those that are working;
- inadequate jobs ratio growth to meet demand;
- out-migration to neighbouring employment centres; and
- a real reduction in rates earnings by Council.

The amended Project would have some negative temporary impacts after the implementation of the nominated control measures with respect to noise, air quality, visibility and transport, albeit that each of the impacts have been substantially mitigated to acceptable levels. However, the amended Project would have a range of positive impacts with respect to local, regional, State and national economic benefits, improved local infrastructure, support for a range of community services and projects, and improved agricultural productivity.

On balance, it is considered that the benefits of proceeding with the amended Project would outweigh the negative impacts on the environment and surrounding community. The nominated consequences of not proceeding with the amended Project also weigh heavily in favour of proceeding with the amended Project.

6.4 CONCLUSION

The amended Project has, to the extent feasible, been designed to address the issues raised by government agencies and the concerns of a number of persons and groups in the local community. The amended Project provides for extraction and processing of up to 2.0Mtpa of ROM coal producing up to 1.3Mtpa of high fluidity semi-hard coking coal for export to Asian steel mills.

This document and the range of specialist consultant studies undertaken have identified the manner in which the amended Project could proceed and minimise the adverse environmental effects upon the local community but provide a wide range of benefits. This assessment has established that if the amended Project proceeds, it would:

- i) contribute towards satisfying the demand for high quality coking coal products;
- ii) result in significant benefits to the local, regional and National economies;
- iii) have an acceptable and manageable impact on the biophysical environment;
- iv) address actual and perceived social impacts;
- v) satisfy sustainable development principles; and
- vi) provide for continuing and future use of the Site for agriculture.