



CHAPTER 6.0

Socio-Economic Analysis



ENVIRONMENTAL IMPACT STATEMENT- AIRLY MINE EXTENSION PROJECT



6.0 SOCIO-ECONOMIC ANALYSIS

This chapter specifically responds to the Director General's Requirements (DGRs), which provide the following in regard to social and economic aspects:

The Director-General's requirements

Social & Economic – including an assessment of the:

- potential direct and indirect economic benefits of the development for local and regional communities and the State
 - potential impacts on local and regional communities, including:
 - any increased demand for local and regional infrastructure and services (such as housing, childcare, health, education and emergency services)
 - impacts on social amenity, particularly impacts on local residents of and other nearby landowners and residents
- a detailed description of the measures that would be implemented to minimise the adverse social and economic impacts of the development, including any infrastructure improvements or contributions and/or voluntary planning agreement or similar mechanism
- a detailed assessment of the costs and benefits of the development as a whole, and whether it would result in a net benefit for the NSW community.

The assessment of the social and economic costs and benefits of the Project are inter-related and as such are addressed together within this chapter. The socio-economic analysis has not been developed as a mutually exclusive component of the EIS but has been considered throughout the development of the Project including its feasibility, mine design, identification and management of environmental impacts, to ensure that ESD principles have been applied throughout the decision making process and incorporated into the EIS. The social impact assessment undertaken for the Project is discussed in Section 6.1, while the economic impact assessment is presented in Section 6.2. This section is informed by the technical assessments, Airly Mine Extension Social Impact Assessment (J.Marshall 2014, Appendix M) and Airly Mine Extension Economic Impact Assessment (Aigis 2014, Appendix N).

6.1 Social Impact Assessment

6.1.1 Methodology

The Social Impact Assessment (J. Marshall 2014, Appendix M) provides a systematic approach to the identification, consideration and assessment of the social impacts of the Project. The assessment identifies and develops mitigation measures to address these potential impacts. The methodology is summarised as follows:

- **Profiling:** Understanding the scale and scope of the Project, parameters of the assessment and identifying the stakeholders (determined by the areas of affectation).
- **Scoping:** Identifying the potential impacts as a result of the Project through consultation and feedback with identified stakeholders. As identified in Chapter 7.0 of the EIS, consultation has been undertaken in accordance with a stakeholder engagement strategy developed for the Project utilising a range of consultation methods such as informal and formal direct consultation, surveys and print media.
- **Social Impact Assessment:** Utilising the outcomes of the Project engagement strategy to determine the extent to which the Project is perceived to impact upon local, regional and State stakeholders.
- **Management:** Identification and development of mitigation measures where feasible. These management measures are for not only potential adverse or detrimental social impacts, but also where those identified as positive can be enhanced and developed. This allows for an assessment as to whether the Project meets a net community benefit criteria.



- **Monitoring:** Strategies to monitor identified impacts to ensure that management strategies are adhered to and that the potential cumulative impacts are identified and monitored where relevant.

6.1.2 Profiling

The Social Impact Assessment has considered the strategic objectives of the Lithgow LGA. The Lithgow region has a long history with mining and as identified in the most recent Australian Bureau of Statistics (ABS) Census 2011 data, mining is the largest industry of employment and is the economic base of the Lithgow Local Government Area (Lithgow LGA) employing 11.6% of the population aged 15 years and over. The importance of the coal mining industry to the regional economy is clearly defined within Lithgow City Council's *Economic Development Strategy 2010-2014* (EDS, 2010), identifying "...only the mining sector had a greater percentage contribution to gross regional product (27%) than its share of employment (12%)".

A review of the Lithgow Land Use Strategy 2010- 2030 (LLUS 2011) emphasizes this regional focus on the importance of the mining industry. The LLUS has informed the draft Lithgow Local Environment Plan (2013), represents a shift towards consolidating residential settlement and away from Lithgow's industrial traditions to creating a more diverse economy via transparent land use planning principles, policies and strategies. For example the existing and potential for tourism growth was identified in the LLUS and has been considered within the assessment. According to EDS (2010) "*tourism is becoming of increasing importance for economic growth and has caused governments and industry to engage in aggressive and intense promotional activities in order to develop and increase the effectiveness and quality of the sector. Lithgow LGA is a place endowed with significant natural and cultural resources that can capture the interests of visitors and therefore increased tourism investment*".

Table 6.1 summarises some of the key changes highlighted in the Land Use Strategy and the potential impacts for Centennial Coal.

Table 6.1: Lithgow Land Use Strategy and Potential Areas of Impact for Centennial Coal

Activities	Reason for Potential Impact
There is an increased number of people living in rural areas	▪ Usually in-migration characterised by people from areas outside the LGA. ▪ Landholders in rural areas not always resident of the LGA. ▪ Emergence of different values and connections to Lithgow ie. people do not always identify with the area's mining history. ▪ Small lifestyle farms meaning that land holders will actively protect water and other resources if they feel they are being threatened. ▪ Fear in loss of land value.
Addressing land use conflict, especially between industrial uses and residential land uses.	▪ There are a number of examples where communities and industry has co-existed for many years. However the shift in demographics, differing community expectations away from Lithgow's industrial past, and the desire to preserve social amenity has led to increasing land use conflict.
Protection of sensitive environmental areas.	▪ Centennial Airly has a number of activities within identified sensitive environmental areas such as Mugii Murum-ban State Conservation Area and Capertee Valley. ▪ There is an increasing move to protect these areas by a range of stakeholders which are not limited to NGOs eg The Colong Foundation; The Blue Mountains Conservation Services (BMCS) but also include land holders who have moved into the area.
Support and protection of other industries such as tourism.	▪ There is a move to recognise and pursue other industry sectors that are not related to mining and power generation to broaden and stabilise the economic profile of the Lithgow LGA. Tourism is one such sector. ▪ Moves to retain and protect key 'gateways' and scenic landscapes for visitors / travellers will become a priority.



The Social Impact Assessment (Appendix M) identifies the mechanisms employed by Centennial Airly to avoid and mitigate these impacts, where possible.

It is recognised that there is a benefit brought to local communities through ongoing employment within the region. Employment in the mining industry provides flow-on effects for local support services via direct and indirect employment opportunities across a range of sectors. The flow-on effect of mine related employment and importance to the wider regional community is achieved through direct spending, participation in social infrastructure programs such as local school attendance and participation in local sporting and volunteering activities.

In juxtaposition with the benefit of mine related employment is community concern. There are a range of reasons as to why people have come to live in and around the Capertee Valley, however, the majority have chosen to live there because of its high scenic and conservation value. It is evident that many of the landholders in this area do not identify with the Lithgow LGA and the traditions of mining and power generation. These landholders do not shop in Lithgow and question the services (or lack of) they receive from Lithgow City Council.

Population and demographic data for Capertee and Glen Davis also indicate some key differences when compared to the Lithgow LGA including the following.

- The population of the area has a high median age when compared with the Lithgow LGA. The median age for the LGA is projected to be 51 years by 2036. The median age would potentially be much higher for Capertee and Glen Davis / Glen Alice given that the current median age is 48 years and 51 years respectively.
- There are more people who work in agriculture and farming in Capertee and Glen Davis compared to Lithgow LGA on average.
- There are a significant number of unoccupied private dwellings. It is noted that an increasing number of landholdings are owned by people not resident in the locality. These landholdings may be used as weekend and holiday retreats. Consultation with local residents found that the 'quoted' population figure fluctuates however is much higher than what is recorded by the ABS Census 2011. Therefore the above population characteristics may not necessarily reflect the entire profile of community stakeholders who are landholders in the area and therefore may have an interest in the Project.
- There is a lower than average weekly family income than that of the Lithgow LGA.
- Mortgage and rental repayments are substantially lower than that of the LGA.
- A high proportion of people who either own outright or are purchasing their home.

There is a strong sense of 'neighbouring' found across the Capertee Valley, demonstrated for example, via membership in local bushfire brigades, involvement in social events and a willingness to assist if assistance is required.

Many residents undertake activities that aim to preserve and protect the environment and can be described as being custodians of the land. This is evident via a number of examples that include; planting of native vegetation to create green corridors and foster bird habitats in areas that have been cleared, gaining general knowledge simply by walking throughout the area, documenting the place via painting and photography, providing water and food in areas where there is a lack of wildlife, observing wildlife and publishing reports on their findings, hosting events and activities to generate social cohesion and providing opportunities to promote the area to others through tourism.



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There is widespread concern about the Project. The area has high conservation value and the community with an interest in the Project are not limited to landholders. The areas of concern most often identified are the following.

- Surface and groundwater impacts have been raised as key areas of concern from surrounding landholders, especially in the Glen Davis, Glen Alice and Bogee areas. It has been often stated that water in these areas is scarce and there is fear that the limited access to groundwater will be threatened in terms of quality and quantity by the Project.
- Impact of subsidence on surface features on the area and in particular cliff lines.
- Loss of rural amenity due to noise, deposited dust, visual impacts, night time lighting and traffic.
- The potential for irreversible damage to the environment if the mine does not perform as it is intended resulting in polluted water discharge into Airly Creek, damage to surface features such as cliffs due to subsidence and loss of groundwater.
- The lack of benefit for the broader community as the Project will not employ local people and will therefore not generate local spending, participation in social / community activities, contribute to the school population etc.
- The risk to the environment due to the perceived lack of financial viability of the Project.

There is also support for the Project. Some landholders who live in the Capertee Valley do not see Airly Mine as having any adverse impact on people's lifestyle or on the environment. Some of these residents are long term landholders and some have come to the area more recently. Issues and concerns around loss of ground and surface water; adverse air quality and noise are dismissed. What is stated to be a priority by these landholders is the need to create employment and that mining can be undertaken without having an adverse impact on the environment or on people's way of life.

6.1.3 Scoping

The assessment was supported by a number of site visits, extensive consultation, participation in Airly Mine's Special Monitoring Committee (Section 7.3.1), and participation in four Community Technical Sessions where specialist consultants provided an overview of their work and findings. The following primary stakeholder 'groups' have been identified as the following.

- 1) Those who are supportive of the Project due to the potential for employment of local residents.
- 2) Those who approach the Project with caution as there are concerns regarding the potential environmental impacts. These stakeholders request information to satisfy their concerns and are open to this feedback.
- 3) Those who oppose the Project and mining generally due to general environmental impacts, impacts on required resources (in particular water) which will have an adverse impact on agricultural viability and land value.
- 4) Those who oppose the Project as their social values and connection to the area is lost or threatened due to the mine regardless of actual impacts.
- 5) Visitors and tourists.
- 6) Employees of Airly Mine and National Parks and Wildlife Service.

Understanding of the land ownership surrounding the Project (i.e. near neighbours) is also important to identify if there are potential amenity impacts arising from the Project. The following has been considered in this regard.



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- Near neighbours can be affected by noise, dust, visual, light, traffic impacts and any other factor of the mines operation which adversely impacts on residential social amenity.
- Identified potential environmental impacts of the Project (ie ground and surface water) may extend beyond the Project Application Area and adversely affect the economic viability of agricultural land uses.
- Residents living on major transport routes may be impacted upon by employee traffic at various times (aligning with shifts).
- Any requirement to purchase property may cause existing residents to relocate. Therefore social networks and social fabric of the area may be adversely affected.
- The impacts of the mine may extend to other users of the area. For example this area may have high tourist value and elements of these values may be adversely impacted upon.

Centennial Airly owns approximately 2000 ha of land around the pit top and surface facilities which provides a significant buffer between it and other sensitive receptors (i.e. private residences). Furthermore, the majority of the Project Application Area is Crown Land and classified as State Conservation Area. This land is managed by National Parks and Wildlife Service. These factors significantly reduce the potential for adverse social amenity impact of Airly Mine's operations on near neighbours. There is no requirement to purchase property as a means of managing any environmental impact.

6.1.4 Social Impact Assessment

The mine design is the means in which changes to the environmental, economic and social conditions are determined. The likelihood and extent of these changes are key factors in determining the scale of social impact. The mine design chosen for the Project is the most viable and preferred option, taking into consideration that the Project is within a State Conservation Area with varying constraints of geology (lithology and ash content), geotechnics (structural zones, strata characteristics), and the environment (cliffs, pagodas and archaeological features).

The outcome of detailed mine planning and design reduces the occurrence of subsidence effects to negligible levels, without compromising the viability of the business. While the environmental impacts are reduced, the mine design results in increased development costs and the sterilisation of coal reserves. The potential environmental impacts of the Project have been minimised through obtaining a detailed understanding of the key environmental issues. The multi-disciplinary assessment and consultation have been undertaken to a level of detail commensurate with the scale of the Project, industry standards and the legislative framework under which the Project is considered.

The proposed use of various partial extraction mining methods in the Project will manage subsidence not to exceed 125 mm in previously unmined areas, and minimise further potential subsidence impacts in areas where the historical New Hartley Shale Mine has already impacted the environment. The Project has been designed to ensure there is negligible impact, meaning the changes to the environment are no greater than what would occur under natural conditions. Mining zones have been identified to ensure that the mining methods employed meet the mine criteria.

The extent of long term social change arising from the Project is minimal and will not adversely impact on people's lifestyle or how people access and utilise the Mugii Murum-ban State Conservation Area. There will be no change to the social amenity of the area; economic activities in neighbouring properties arising from this Project brought about by subsidence, ground and surface water impacts (quality or quantity), noise, dust or visual impacts. The conservative mine design, the low coal production rate (1.8 Mtpa) and a small pit-top footprint will ensure the Project will have a negligible impact on the environment.

Employment is a positive social impact of the Project. However, the Charbon Colliery employees that have been redeployed to Airly Mine will provide little additional benefit to the local financial and social economy.



The employment profile however does not indicate any adverse impact on existing services or facilities and the Project will not create any demand for additional services or facilities.

As stated above, the Project has resulted in some degree of angst across the community, evident through the consultation process and feedback received from the community technical sessions. Despite there being limited change proposed in the Project over that was already approved in the current consent and thus minimal impact to the environment and community, it is expected that these concerns will continue.

The key social impact arising from the Project is related to the high regard the surrounding community has for the environment. The presence of the Project, regardless of the actual physical change, represents a loss of the connection to the environment which the community hold in high regard. This impact is called solastalgia, a term used to explain the psychological change when people's connection to the land is at risk. It is sometimes described as "... a form of homesickness one gets when one is still at 'home'" (G. Albrecht 2005).

6.1.5 Management

In order to assess the level of social change arising from the Project, the various specialist consultants' reports have been reviewed against areas of concern raised by the community, to assess if any changes to the social conditions of the area are likely and if so, the extent of change.

It is demonstrated that the Project has adopted a conservative mine design that limits impacts to the surrounding community. In essence the potential impacts have been managed to largely remain within the Project Application Area. The potential impacts outside the Project Application Area are limited to the following.

- Very minor and localised reductions in total average flow in Gap and Genowlan Creeks (<3%) are expected resulting in negligible impact to surface water supplies on neighbouring properties.
- Limited visual impact will arise from the existing surface infrastructure at the pit top and the Proposed REA primarily from Cameron Road and when travelling along Glen Davis Road.
- Potential for water discharge to Airly Creek will be minimal.
- Potential for noise and dust to extend beyond the Project Application Area however is unlikely and the predicted noise levels are well within compliance limits.

In summary the Project results in:

- no requirement to purchase property as a means of managing impact on social amenity
- no impact on surrounding land use or viability of agricultural production
- no significant change to the economic profile of the community except for the potential for incidental economic benefit via localised spending
- no change to the social fabric of the area
- no change to how residents or visitors utilise the area
- employment of up to 135 comprising full time employees and 20 contractors for a period of 25 years.

The Project will result in overall benefit to the region and NSW economy. The findings of the assessment with regards to the specific requirements of the DGRs are outlined in Table 6.2.



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Table 6.2: Social Impact Assessment Findings

Assessment	Findings
Any increased demand for local and regional infrastructure and services (such as housing, childcare, health, education and emergency services)	There will be no increased demand for local and regional infrastructure and services. The Project will employ existing residents who are likely to be largely from communities other than Capertee or Glen Davis/Glen Alice. Employees are established in their communities and will not require any further infrastructure.
Impacts on social amenity, particularly impacts on local residents of and other nearby landowners and residents	The Project will result in only minor changes to areas outside of the Project Application Area. This is due to the significant buffer that exists and the conservative mine design and method. Relevant changes to social amenity are as follows. ▪ Very minor and localised reductions in total average flow in Gap and Genowlan Creeks (<3%) are expected resulting in negligible impact to surface water supplies on neighbouring properties. ▪ Limited visual impact on surface infrastructure and the REA primarily from Cameron Road and when travelling along Glen Davis Road. ▪ Water discharge to Airly Creek will be minimal. ▪ Noise impact that exceeds the Project Application Area however is well within compliance. These impacts are minor and within compliance.
A detailed description of the measures that would be implemented to minimise the adverse social and economic impacts of the development, including any infrastructure improvements or contributions and/or voluntary planning agreement or similar mechanism.	The conservative mine design, the small disturbance footprint, the size of the buffer lands to the north, west and south of the pit top and relative low coal production rate are the measures that have been implemented to minimise the adverse social impacts. The Project will not result in changes to the existing community, change the way in which residents or visitors will utilise the area or change the characteristics of any surrounding landholdings (ie agricultural production). Adaptive mine methods will allow for correction to be undertaken before any adverse impacts result.

6.1.6 Monitoring

As discussed in Section 3.13 and Section 4.13, Airly Mine will continue to undertake monitoring in accordance with approved EMPs. A review of the existing EMPs will be undertaken, and plans undated as appropriate, to take into consideration the environmental assessments undertaken as part of this EIS, the Statement of Commitments, and all relevant consent conditions. Reviews of the monitoring data will be undertaken on a regular basis to ensure that management strategies are adhered to and that the potential cumulative impacts are identified and monitored where relevant.

6.1.7 Conclusion

The Project will result in an overall benefit to the region and the NSW economy. It is found that the principles of ESD have been considered and achieved in all aspects of the Project.

6.2 Economic Assessment

6.2.1 Methodology

The Economic Impact Assessment (August 2014) for the Project has been completed by AIGIS Group (Aigis 2014, Appendix N) and addresses the relevant economic assessment requirements of the DGRs and further relevant legislation. This has been undertaken principally through providing an assessment of the direct and regional economic benefits and costs of the Project and identifying the Project's net cost or benefit to the NSW community. The approach taken to this assessment is to apply a 'triple bottom line' framework to considering the interdependent social, economic and environmental benefits and costs associated with the



Project. This approach is consistent with consideration of the requirements of ecologically sustainable development required under the legislation.

The approach used in Aigis (2014) could be considered as being unorthodox in the context of the use of cost-benefit analysis techniques. However, the aim of the assessment approach was to produce material which facilitates 'lay' stakeholders to better comprehend the analysis presented, as it relates to Project impacts likely to be of greater significance to such stakeholder groups.

In order to estimate the net cost or benefit of the Project, all technical reports that address the key issues associated with the Project have been the subject of qualitative and quantitative analysis to provide monetised estimates of key aspects of the Project.

6.2.2 Social and Economic Benefits and Costs

In the context of the Project, potential risks to social amenity are:

- impact on the intrinsic value of the area
- direct impact on the social amenity of the area (brought about by noise, dust, visual impacts etc.) that requires the use of conventional mitigation strategies, or where conventional prospective controls and/or mitigation strategies are effective
- direct impact on the social amenity of the area (brought about by noise, dust, visual impacts etc.) where conventional prospective controls and/or mitigation strategies are not effective.

The Social Impact Assessment (Section 6.1) concludes the social impacts of the Project are minimal. This is because the extent of the change to the physical environment will have a low adverse impact on the existing land use.

As identified in the LLUS, the role of the mining industry is critical to the functioning and economic wellbeing of the Lithgow LGA economy.

The NSW Department of Planning and Infrastructure has determined that the appropriate planning authority to determine if a Voluntary Planning Agreement (VPA) or S94 contribution is applicable is Lithgow City Council. Discussions between Centennial Airly and Lithgow City Council are ongoing on this matter.

6.2.3 Estimated Economic Benefits

The benefit – cost analysis (BCA) data presented in this section are present values (PV) and net present values (NPV), at an assumed discount rate of 7%, except as otherwise noted¹. The assumed Project timeframe is 2014 to 2034.

The key economic benefits that accrue to the local and State communities, as distinct from the proponent corporation, are as follows.

- Salaries and wages paid to contract workers in the construction phase of the Project. These incomes then support additional activity in other sectors of the economy.
- Salaries and wages paid to full time employees on mining operations associated with the Project, with similar flow-on effects to those noted above.
- Royalties on product coal which are remitted to the State. These are then redistributed across the State community in the form of publicly-provided goods and services.
- A range of federally-levied taxes, a proportion of which is similarly redistributed across the State community.

¹ The economic appraisal principles employed herein are consistent with relevant parts of NSW Treasury/Planning NSW Cost Benefit Analysis for mining and coal seam gas proposals (2012) and NSW Treasury TPP07-6 Economic Appraisal Principles and Procedures Simplified.



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- Various State (e.g. payroll tax) and Local Government (e.g. council rates) taxes, rates and charges. These contribute to provision of further public goods, services and facilities.

The construction of the surface infrastructure will support an average of 20 contract employees over the nine-month Project's construction program.

The Project will require the employment of 135 persons FTE potentially, and up to 20 contractor positions. These forms of employment are the source of significant direct and derived economic benefits, and also have positive social and welfare benefits, for the local communities in which these employees reside and spend a proportion of their incomes.

In addition to these household income-related benefits, the royalties and taxes generated are also a source of benefit to these communities. Table 6.3 shows the valuation of these benefits, and the basis of the valuation for each.

Table 6.3: Estimate of Economic Benefit of the Project

Economic Benefit	Estimation assumptions	Estimate
Construction phase employment	23 FTE positions over 9-month construction program commencing April 2014.	Assessed PV ≈ \$0.5 million.
Mine operation-stage additional/sustained employment	Direct operations employment: 135 FTE positions.	Assessed PV ≈ \$87.8 million.
	Mining related contractor employment: 20 FTE positions	Assessed PV ≈ \$14.3 million
Coal royalties (State Government)	Based on assessed output over mine life extension period 2014-2034, and royalty rate of 7.2% ²	PV ≈ \$120.4 million
Other State taxes/Local Government rates & charges	e.g. Payroll tax ³ ; council rates	PV ≈ \$15.9 million
Federal taxes (e.g. Corporate income taxes)	Based on assessed corporate income & corporate tax rates	Return to NSW at 30.6%, assessed PV ≈ \$70.5 million ⁴⁵⁶
Project impact controls and mitigation provisions ⁷	Particulars included in Table 10 the Economic Impact Assessment (Appendix N), rehabilitation section (Section 10.9 of this EIS).	PV ≈ \$35 million
Total economic benefit (PV)		≈ \$344.4 million

² Deep underground coal (+400m) 6.2 per cent; other underground coal 7.2 per cent, open cut coal 8.2 per cent. Includes deductions for beneficiation and other levies.

³ Assessed on NSW OSR January 2014 assumptions: \$750,000 threshold, 5.45% tax rate.

⁴ Commonwealth of Australia (2014): Budget 2014-15 Budget Paper No 3, Part 3, General Revenue Assistance. Table 3.2 General revenue assistance by State. < http://www.budget.gov.au/2014-15/content/bp3/html/bp3_04_part_3.htm >

⁵ Includes provision for tax treaty impacts associated with foreign ownership.

⁶ No provision is allowed for the Mineral Resources Rent Tax, due to its planned repeal under the current Federal Government.

⁷ The benefit of the conservative mine plan proposed (NPV \$19 million) assumed as an environmental benefit to the community, is offset by the cost to the community of \$19 million in government revenues (royalties) foregone. Present value of environmental works and compliance activity is estimated at \$18 million (2014-2034).



6.2.4 Estimation of Economic Costs

The DGRs identify key issues that the EIS prepared for the Project must address. These relate to:

- subsidence
- land resources
- water resources
- biodiversity
- heritage
- air quality
- greenhouse gases
- noise
- traffic and transport
- visual
- social and economic
- rehabilitation.

Each of these matters is addressed within the EIS, and are the subject of specialist assessment reports appended to the EIS. A qualitative and quantitative analysis of these aspects of the Project is included in Table 10 of the Economic Assessment (Appendix N). The table also details or cites controls and mitigation measures proposed by Centennial Airly for addressing these impacts.

In order to estimate the net cost or benefit of the Project, it is necessary to provide a monetised estimate of these impacts, based on specialist assessments of their magnitude, and relevant valuation methodologies, which are displayed in Table 3 of the Economic Assessment (Appendix N). In relation to these valuations, three key points must be observed as follows:

- Where possible, valuation methodologies are derived from studies accessed through relevant government bodies. This may be considered as placing some greater level of reliability on these studies.
- The identified valuation methodologies have been selected to provide approaches which were the most appropriate for application to this Project as was achievable.
- There remains an unquantified element of social impact. This may be described as the 'intrinsic value' of certain impacts or effects, as attributed by individual stakeholders. This aspect is highly individualised and subjective, and consequently may not be accurately quantified, as the estimation techniques applied, although based on valid methodologies, may not align with individual stakeholders' values. It is noted that a number of specialist reports relating to the Project estimate no impacts, or very limited impacts. As a consequence, the valuations made in this report in respect of these specific matters may be considered as taking account of this less tangible aspect of impact.

Table 3 presented in the Economic Assessment (Appendix N) identifies the bases for quantifying the environmental impacts contained in the DGRs as described above. Table 4 in Appendix N applies these valuation methodologies, relevant population data (e.g. Australian Bureau of Statistics Census 2011) and specialist consultant estimates of impacts, to derive present values of the relevant estimates for the Project. Table 10 of the Economic Assessment (Appendix N) compares the benefit and cost impacts in the context of those quantified assessments and the key qualitative aspects of each impact, with particular emphasis on the matters identified through the stakeholder consultation process. In addition Table 10 (Appendix N) identifies the policies, prospective controls and mitigation measures, including those currently employed by Airly for existing operations and/or those specifically proposed for management or mitigation of the external impacts of the Project.



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The estimated economic cost of the Project is \$85 million. Table 6.4 itemises the estimated assumptions and costs associated with the impacts of the Project.

Table 6.4: Economic valuation of social and environmental costs of the Project⁸

Social/environmental cost	Estimation assumptions	Estimate of cost (Life of Mine)
Noise	Cost to community \$106,080 (2014 value)	Assessed NPV ≈ \$1.5 million
Subsidence	Cost to community \$1,458,825 (2014 value)	Assessed NPV ≈ \$20.1 million
Soil and land capability	Cost to community \$1,458,825 (2014 value)	Assessed NPV ≈ \$20.1 million
Surface water & groundwater	Cost to community \$1,458,825 (2014 value)	Assessed NPV ≈ \$20.1 million
Air	Cost to community \$19,805 (2014 value)	Assessed NPV ≈ \$300K
GHG emissions	Cost to community \$132,250 (2014 value)	Assessed NPV ≈ \$1.4 million
Heritage	1. Cultural Heritage: Cost to community \$7,756 (2014 value)	Assessed NPV ≈ \$107K
	2. Natural Heritage (Natural Landscape Features): Cost to community \$1,458,825 (2014 value)	Assessed NPV ≈ \$20.1 million
Biodiversity ⁹	Cost to community \$48,444 (2014 value)	Assessed NPV ≈ \$667K
Visual amenity	Cost to community \$46,367 (2014 value)	Assessed NPV ≈ \$638K
Economic valuation of social and environmental cost		≈ \$85 million

6.2.5 Estimation of Net Economic Benefit/Cost

Based on the benefit and cost assessments detailed in Table 6.3 and Table 6.4, the following provides a summary of the net economic benefit/cost of the Project (rounded to the nearest \$1 million) for the State and regional communities:

- Economic benefit (PV) ≈ \$344 million
- Economic cost (PV) ≈ \$85 million
- Net present value (NPV) ≈ \$259 million
- Benefit-Cost Ratio of 4.0

⁸ All estimates presented are rounded to the nearest \$100,000.

⁹ The valuation for subsidence and natural heritage also entail recognition of the value of possible biodiversity effects on significant surface features such as cliffs, pagodas and the ecological communities associated with these. This assumption is stated in Table 10 in Aigis (2014) (Appendix N).



6.2.6 Net Contribution of the Mining Sector

The mining sector is of significant importance in the context of a relatively small regional economy. This is suggested by a number of matters raised in the Lithgow City Council's *Economic Development Strategy 2010-2014*. The comparison of employment to output identified previously is indicative of a number of factors. Firstly, mining is relatively capital intensive, so the labour input may be comparatively lower.

The Lithgow City Council's *Economic Development Strategy 2010-2014* notes however that as much of the mining in the area is underground mining, this is relatively more labour intensive than open cut mining. Secondly, in terms of regional output, the sector stands out from the remainder of the local economy on the basis of its productivity and income effects relative to labour.

The *Economic Development Strategy 2010-2014* (EDS 2010) also notes that there is scope for expansion in the coal industry, however *"there is still pressure for coal industry downsizing from efficiency rationalisation and this may ameliorate [sic] the benefits of increased exports"* (p. 87). The Project represents a commitment to maintaining operations and the associated employment in the Lithgow LGA.

The sustained operational and additional construction-related positions in the Project are of regional significance. The *Economic Development Strategy 2010-2014* emphasises the potential for severe impacts on the local economy that are likely to result from any premature curtailment of mining activity, as is exemplified in the following statements from the document.

- *"The major concern here is that many of these mining jobs are concentrated into a handful of businesses hence, as has been experienced in the past, any job losses tend to be on a large scale and hence may have an immediate impact upon the community".*
- *"This may have an impact upon the level of disposable income available to the Lithgow Resident Workforce in the future should the number of people in the mining industry decline further".*
- *"This industry sector [mining] has also been shown as having a propensity to fluctuate mainly due to its sensitivity to international market forces. A critical impact of this is local business being heavily reliant upon a relatively small proportion of the community which has disposable income but one which can also be severely affected by changes to employment status. These families can also be considered as transient due to the specialised nature of their skills base. In other words a workforce with niche skills such as those in the mining industry are [sic] more likely to move from one region to another for work taking their disposable income with them".*

With regard to the Mid Western Regional Council (MWRC LGA), its Land Use Strategy document includes several references to the important role of mining in the current and future economic development of the Lithgow LGA. Relevant commentary from the document is included below.

- (from Section 1.4 Objectives, Subsection 1.4.1, Economic prosperity): *"ensure that existing industrial development (including mining and extractive industries) is allowed to prosper and grow.*
- (from Part 2, Guiding principles for the Strategy, Section 2.1, Rural land): *"Recognise the important contribution of industry makes (sic) to Mid-Western Regional Council local government area and the region"; "Recognise mining, extractive industry, forestry as a key primary production use and potential in the Mid-Western Regional Council local government area".*
- (from Section 4.4 Mining and Extractive Industries): *"despite only accounting for less than 1% of the total land area, mining is a key driver in the growing population and economy in the Mid-Western Regional local government area with the coal (and oil) mining sectors making the largest contribution to wages and salaries in the local government area".*

As is the case with the Lithgow LGA, these statements substantiate the strategic importance of mining to growth and prosperity in the region.



ENVIRONMENTAL IMPACT STATEMENT- AIRLY MINE EXTENSION PROJECT

In applying the above methodology, both the Economic Impact and Social Impact Assessments have considered the broader socio-economic impacts of the Project. The sustainability of the mining sector and its related employment is clearly vital to the broader economic wellbeing of the area. The Project will have a direct and positive impact on economic sustainability over the period in which coal resources can be economically extracted, both directly for employees and their households and indirectly for the broader regional economy.

Employment in the mining industry provides flow-on effects for local support services via direct and indirect employment opportunities across a range of sectors. The flow-on effect of mine related employment and importance to the wider regional community is demonstrated by the application of multipliers for both the ongoing employment and engagement of contractors during construction.

6.2.7 Employment Multipliers

The NSW Department of Trade, Investment, Regional Infrastructure and Services (Division of Resources and Energy) identified output and employment multipliers for mining and related services. While acknowledging the limitations on multiplier analysis, observed by, for example the ABS¹⁰ the application of the relevant NSW Government Department's declared multipliers adds validity to the analysis. The relevant multipliers are displayed in Table 6.5 and Table 6.6.

Table 6.5: Type 2A Multipliers – mining and services

Description	Multiplier value
Output Multiplier – mining & services	2.136
Gross Value Added Multiplier – mining & services	4.099
Income Multiplier – mining & services	2.839
Employment Multiplier – mining & services	3.977

In addition to these mining multipliers, similar multipliers for construction activity were also identified. These are relevant for assessment of the impacts of the initial stimulus associated with the various construction works required for the Project.

Table 6.6: Type 2A Multipliers – construction

Description	Multiplier value
Output Multiplier – construction	2.694
Gross Value Added Multiplier - construction	4.369
Income Multiplier - construction	2.899
Employment Multiplier – construction	2.727

As the stimulus to the economy is equivalent to the additional activity and output associated with both construction and operational phases of the Project, the net benefit of the Project may result in extended economic effects of approximately 2.1 to 4.4 times the initial stimulus, dependent on the economic measure being considered. Employment of the magnitude of approximately 2.7 to 4 times the economic stimulus will result. These indirect positions represent employment supported in the broader economy as a result of the demand for additional goods and services generated by the Project.

6.2.8 Alternatives Considered

The proposed mine plan and design of the Project has been developed to maximise resource recovery and economic benefits to the State (royalties and taxes), while reducing the potential impacts to the site and

¹⁰ A detailed discussion on interpretation and limitations of multiplier analysis is included in ABS Cat No 5246.0; *Information Paper Australian National Accounts Introduction to Input-Output Multipliers*;

¹⁰ For example ABS Cat No 1301.0, *Year Book Australia*, 2002



regional area, particularly in regard to potential subsidence impacts. Centennial Airly has foregone more profitable mine planning options with the aim of ensuring that potential impacts are reduced and managed to an acceptable level. Comparative analyses of the alternatives are included in the Economic Impact Assessment (Appendix N) and Chapter 12.0 of the EIS.

6.2.9 Conclusion

Benefits associated with the Project include the broad social benefit gained as a consequence of the Project in terms of the royalties and taxes that are provided to the State. These are subsequently redistributed across LGAs, including Lithgow LGA and MWRC LGA.

The mine planning stage of the Project involved consideration of the principles of ecologically sustainable development and adopting the 'triple bottom line' paradigm. As a consequence, the design of the Project is expected to result in a beneficial outcome for the region and the NSW State, in addition to maximising the positive social benefits of the Project and minimising environmental and social effects to the greatest achievable extents. Due to the detailed mine design planning process and adoption of relevant mitigation strategies and commitments by the Applicant (Chapter 11.0 of the EIS), the potential negative impacts associated with the Project will be of significantly lesser magnitude than the benefits that will be generated by the Project. This is demonstrated through the qualitative and quantitative analysis completed within the Economic Impact Assessment (Appendix N).

With proposed employment numbers being only marginally higher compared with the Airly Mine as currently approved, the Project will not result in any increased demand for local or regional infrastructure services. The Project will have a low impact upon social amenity and will therefore make no significant change to the existing lifestyle, land use or surface characteristics and will not change the manner in which the public utilise and access land within the Project Application Area. Similarly, the Project will have a low impact upon social amenity and will therefore make no significant change to the existing lifestyle, land use or surface characteristics and will not change the manner in which the public utilise and access land outside the Project Application Area.

This is critical to the socio-economic wellbeing of Lithgow and MWRC LGAs and the broader region with the Project providing a net benefit to the community with regard to social, economic and environmental impacts and benefits.